NATIONAL REGISTER OF HISTORIC PLACES
ELIGIBILITY TESTING OF SITES 41LT56, 41LT310,
41LT387, 41LT397, 41LT415, 41LT422,
41LT424, 41LT425, AND 41RT413
IN LUMINANT’S KOSSE MINE
LIMESTONE AND ROBERTSON COUNTIES, TEXAS

Prepared for:
Luminant
500 N. Akard Street
Dallas, Texas 75201

Prepared by:
Atkins
6504 Bridge Point Parkway
Suite 200
Austin, Texas 78730

Principal Investigator:
Shelly Fischbeck

Primary Authors:
Shelly Fischbeck
David L. Sherman
Sara Laurence
Brandy Harris

with Contributions by:
Katie Canavan
Karissa Basse
Linda W. Ellis
Michael Nash
Leslie L. Bush

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Abstract

Atkins North America, Inc. (Atkins), formerly PBS&J, conducted National Register of Historic Places (NRHP) Eligibility Testing on nine sites (41LT56, 41LT310, 41LT387, 41LT397, 41LT415, 41LT422, 41LT424, 41LT425, and 41RT413), located within the Kosse Mine, owned and operated by Luminant, in Limestone and Robertson counties, Texas. The field investigation took place between July 2010 and March 2011. Six of these sites (41LT56, 41LT310, 41LT387, 41LT397, 41LT415, and 41LT422) have only prehistoric components. Sites 41LT424 and 41RT413 have only historic components. Site 41LT425 had both historic and prehistoric components. The historic component at 41LT425 was represented, in part, by two probable grave markers. Once these remains were recorded, no additional investigation was conducted within 100 feet of the markers. For this reason, the NRHP eligibility status of the portion of 41LT425 within 100 feet of the markers remains unknown. The portion of both the historic and prehistoric components that are beyond 100 feet from the probable burial markers were investigated and does not appear to contribute to the site’s overall NRHP eligibility status. None of the remaining eight sites appear to possess significant data resources that warrant NRHP inclusion.
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Acknowledgments

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Sara Laurence, Candace Wallace, and Gray Rackley produced the report figures. Chris Vidrick provided word processing. David Sherman served as Quality Control Officer, and Linda Nance edited the report.
INTRODUCTION

Atkins North America, Inc. (Atkins), formerly PBS&J, conducted National Register of Historic Places (NRHP) eligibility testing on nine sites (41LT56, 41LT310, 41LT387, 41LT397, 41LT415, 41LT422, 41LT424, 41LT425, and 41RT413) within the Kosse Mine, owned and operated by Luminant, in Limestone and Robertson counties, Texas (Figure 1).

This report has 14 chapters and 6 appendices. Following this introduction, Chapter 2 describes the natural setting of the Kosse Mine. Chapter 3 discusses previous archeological investigations within the vicinity of the project area and provides a regional cultural context. Chapter 4 details the field and laboratory methods. Chapters 5 through 13 present the results of NRHP eligibility testing of the nine sites, address the research questions, and provide recommendations for each site. The references cited in this report follow Chapter 14. Appendix A provides profiles of the backhoe trenches excavated at site 41LT56. Appendix B contains tables on the utilized flake and ground stone attributes from site 41LT56. Appendices C and D present profiles of the backhoe trenches excavated at sites 41LT387 and 41LT424, respectively. Appendix E contains the specimen inventories from all nine sites and is provided on a CD only. Appendix F presents the analysis of the plant remains from sites 41LT56 and 41LT387 conducted by Leslie L. Bush of Macrobotanical Analysis.
Figure 1
Project Setting
NATURAL SETTING

The Kosse Mine is located within the Post Oak Savannah region of east central Texas (Gould 1975). This area is also within the West Gulf Coastal Plain physiographic province (Fenneman 1938). The vegetation consists primarily of upland pastures, forested slopes, and bottomland forests and wetlands. Vegetation communities that occur in the mine area include upland hardwood forests and pastures, bottomland/riparian forests, grasslands, mesquite brushland, hydric communities, aquatic habitats, regenerative areas, and disturbed land.

SURFACE GEOLOGY

The surface geology of the Kosse Mine is dominated by the Eocene-aged Calvert Bluff Formation, which is mostly composed of “mudstone with various amounts of sandstone, lignite, ironstone concretions, and in the uppermost part, locally glauconitic” (Proctor et al. 1970). The floodplain of Steele Creek and the lower reaches of its largest tributaries (Owens Creek and Polecat Creek) are dominated by Holocene alluvial deposits that include “indistinct low terrace deposits; gravel, sand, silt, silty clay, and organic matter” (Proctor et al. 1970). Some of the gravel in the Holocene alluvial deposits may have been suitable for knapping by local prehistoric populations, and is the most likely raw material source for the chert and quartzite lithic artifacts recovered during the survey. The sandstone and ironstone in the Calvert Bluff Formation, if it outcrops locally, may have served as a raw material resource for prehistoric populations for making ground stone tools and grinding implements or for use in roasting pits (see Sherman et al. 2007). Significant deposits of clay suitable for pottery manufacture have been recorded in southern Limestone County and northern Robertson County, and specifically, near Headsville (Potter and McKnight 1931). A large outcrop of kaolinite, which appeared to have been exploited, was identified at site 41LT424 (Sherman and Watkins 2007).

SOILS

General Soil Map Units within the Kosse mine area (Griffin 1997; Hyde 2007) are Edge-Tabor and Crockett-Normangee soils. These soils typically have a dark brown fine sandy loam surface layer underlain by a red clay subsoil. Soil types mapped at the tested sites are listed in Table 1 with their general topographic position and taxonomic designation. Of these series, five soils were classed as Alfisols (Crockett, Edge, Gasil, Lufkin, and Silawa) and one was classed as an Entisol (Nahatche).
### 2. Natural Setting

#### Table 1: Soil Types in the Kosse East Mine Area

<table>
<thead>
<tr>
<th>Soil Symbol</th>
<th>Soil Name</th>
<th>Location</th>
<th>Taxonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CrB</td>
<td>Crockett loam, 1 to 3 percent slopes</td>
<td>Uplands</td>
<td>Alfisol</td>
</tr>
<tr>
<td>EgB</td>
<td>Edge fine sandy loam, 1 to 5 percent</td>
<td>Ridge tops and broad stream divides</td>
<td>Alfisol</td>
</tr>
<tr>
<td>EgD</td>
<td>Edge fine sandy loam, 5 to 12 percent</td>
<td>Upland sideslopes</td>
<td>Alfisol</td>
</tr>
<tr>
<td>GfB</td>
<td>Gasil loamy fine sand, 1 to 5 percent</td>
<td>Broad uplands</td>
<td>Alfisol</td>
</tr>
<tr>
<td>LfA</td>
<td>Lufkin loam, 0 to 1 percent slopes</td>
<td>Uplands</td>
<td>Alfisol</td>
</tr>
<tr>
<td>Na</td>
<td>Nahatche loam, frequently flooded</td>
<td>Primarily floodplain of Owens and</td>
<td>Entisol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polecat creeks with minor amounts in</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>the floodplain of Steele Creek</td>
<td></td>
</tr>
<tr>
<td>SaD</td>
<td>Silawa fine sandy loam, 5 to 12 percent</td>
<td>High stream terraces</td>
<td>Alfisol</td>
</tr>
</tbody>
</table>

Alfisols are the dominant soil order at the sites tested. These soils typically have light-colored, loamy A horizons with clay-enriched B horizons. Most of these soils formed in sandy or loamy residuum, and all are found on upland landforms. Archeological sites found in these soils can be expected to be shallow, unless buried in colluvium. All of these soils are acidic, and their low pH is generally detrimental to the preservation of organic archeological materials.

Entisols are recent soils that have little evidence of the development of genetic horizons. The only Entisol present on the tested sites is Nahatche loam, frequently flooded, which is mapped on a small portion of site 41LT387. Entisols are floodplain soils that formed in loamy and clayey alluvium. They are acidic, poorly drained, and are frequently flooded for long periods. A perched water table typically occurs between depths of 30 and 70 centimeters (cm). These soils are not conducive to the preservation of bone or carbonized organic remains.
PREVIOUS INVESTIGATIONS

A substantial amount of archeological investigation has been undertaken within the immediate project vicinity. Several surveys have been completed within the Kosse Mine (Glander et al. 1984, 1986, 1988; Sherman and Dixon 2010; Sherman and Watkins 2007; Sherman et al. 2006). Eight prehistoric sites have been subjected to NRHP eligibility testing in the Kosse Mine including 41LT247, 41LT248, 41LT253, 41LT259, 41LT320, 41LT336, and 41LT347 (Sherman et al. 2007), and 41LT321 (Sherman and Watkins 2008). Three historic sites (41RT530, 41RT537, and 41RT538) were also subjected to NRHP eligibility testing (Loftus and Harris 2009). Of the 11 sites tested to date, only site 41LT320 was determined to be eligible for NRHP inclusion. Site 41LT320 is a Late Prehistoric site located on a toeslope above Heads Creek.


Recent natural gas pipeline cultural resources surveys conducted by PBS&J have also recorded prehistoric and historic sites within this region (Dixon and Norton 2005; Dixon et al. 2005; Dixon et al. 2006; LeFevre et al. 2008; Norton and Dixon 2007). These investigations have shown that this part of Texas has been inhabited by human populations since approximately 10,000 B.P.
3. Previous Archeological Investigations and Cultural Context

**PREHISTORIC CULTURAL CONTEXT**

This brief discussion follows closely the regional synthesis outlined by Fields (1995) for the Post Oak Savannah region of Texas, which is based largely on the numerous survey, testing, and data recovery investigations conducted at the nearby Jewett Mine, as well as the results of the RCAP (McGregor and Bruseth 1987). This chronology is broken down into three periods—pre–Late Archaic (prior to 2000 B.C.), Late Archaic and Woodland (2000 B.C.–A.D. 800), and Late Prehistoric (A.D. 800–1650).

Few components dating to the pre–Late Archaic period have been excavated in this region, and little is known about it. Occupation during this time appears to have been sporadic, with highly mobile populations subsisting on hunting and collecting strategies (Fields and Tomka 1993). The earliest dated component excavated at the Jewett Mine was identified at 41LN106 and was represented by a burned rock hearth with a radiocarbon date of 8000 B.C. and late Paleoindian–Early Archaic projectile points (Fields 1995). Components from this period are often found mixed with materials from later periods or are represented by isolated artifact finds.

Relatively more information has been recovered relevant to the Late Archaic to Woodland division for this part of Texas. An increase in population density and a decrease in territory size have been postulated for the Late Archaic, based on the RCAP and Jewett Mine investigations. The presence of nonlocal lithic materials indicates some degree of mobility or interaction with other peoples (Fields 1995). McGregor and Bruseth (1987) noted a decrease in the distribution of Pisgah Ridge chert and an overall decrease in the amount of chert used during the Late Archaic. These observations are interpreted as indicating a reduction in territory size during the Late Archaic (McGregor and Bruseth 1987).

Distinctive site types appear during this period, with base camps located in riverine settings and subsistence resource processing-extraction sites located in the uplands. A subsistence shift or shift in culinary technology seems to be evidenced by the presence of ceramics and a decrease in the frequency of burned rock features at Woodland sites.

Wylie pits, thought to represent evidence of “transitional Archaic band coalescence,” were excavated at the Bird Point Island site (41FT201) and the Adams Ranch site (41NV177) during the RCAP investigation (McGregor and Bruseth 1987:237). These pits are thought to indicate an increased reliance on plants over animals for subsistence during the transitional Late Archaic. Shell-tempered ceramics, dated to between A.D. 200 and 700, were recovered in a large depression at the Adams Ranch site (McGregor and Bruseth 1987).

Twenty components dating to the Late Archaic and Woodland periods were excavated at the Jewett Mine by Prewitt and Associates (Fields 1995). Of these components, 15 were interpreted as residential bases and 5 as procurement-processing locales. Artifacts recovered include Late Archaic dart points such as Dawson, Gary, and Yarbrough as well as a small number of sandy paste and...
3. Previous Archeological Investigations and Cultural Context

grog-tempered or grog-and-bone-tempered ceramic sherds. Two possibly early shell-tempered sherds were also recovered.

A sparse Woodland or Early Ceramic component was identified 41GM282 in the Gibbons Creek Mine (Rogers 1995a), from where an Ellis and a Williams dart point were recovered. Four other sites with Late Archaic components were excavated at the Jewett Mine by EH&A (Sherman et al. 1998). These four components yielded Gary, Edgewood, and Elam dart points and are thought to represent short-duration occupations.

Settlement and subsistence patterns changed during the Late Prehistoric period. Late Prehistoric sites suggest a higher use-intensity and increased sedentism, represented by a greater variety of artifacts and features as well as an increase in the numbers of discarded ceramics over earlier sites.

Three archeological phases (Richland Creek—A.D. 700 to 900; Round Prairie—A.D. 900 to 1300; and St. Elmo—A.D. 1300 to 1650) were defined for the RCAP to describe components dating to the terminal Woodland and Late Prehistoric periods (McGregor and Bruseth 1987).

Eight sites dating to the Richland Creek phase were investigated during the RCAP. A further reduction in territory size over the Late Archaic is postulated for this period (McGregor and Bruseth 1987). Evidence of impermanent residential structures, in the form of posthole clusters, along with the presence of middens, suggests semisedentary habitation at some sites. The bow and arrow (represented by Scallorn and Steiner arrow points) was introduced during this period and appears to have been used in conjunction with the atlatl (represented by dart points). Drills and awls also make their appearance during this phase. The shell-tempered ceramics found on some Late Archaic sites are absent on sites dating to this period, while undecorated sandy paste ceramics and decorated ceramics with grog, grit, and bone tempering have been recovered. Large roasting pits, smaller than those identified at Late Archaic sites, continued in use during this period.

Round Prairie phase components were recognized at eight sites investigated during the RCAP (McGregor and Bruseth 1987). The most detailed data representing this phase came from the Bird Point Island site, which is interpreted as a sedentary settlement. The trend of decreasing territorial size that began during the Late Archaic appears to have continued during this phase. Although no new technological advances were introduced during this period, the presence of dart points in features inside House 1 at Bird Point Island demonstrates their continued use, perhaps as multipurpose tools, after the introduction of the bow and arrow (McGregor and Bruseth 1987:244–245). Alba arrow points became more common, while earlier types, Steiner and Scallorn, became less so during this phase. Animal species exploited included deer, turtle, fish, and bison. Plant species exploited included hickory, pecan, Psoralea, and seeds.

Five St. Elmo phase components were recognized during the RCAP investigation, with the components at Bird Point Island and Little Cedar Creek being the most intensively investigated (McGregor and Bruseth 1987). A decrease in the number of components dating to this phase over
the previous two argues for a reduction in population. Settlement patterns appear to have shifted during this phase towards reduced sedentism. Clusters of postholes, rather than complete circular patterns, are suggestive of impermanent structures. A centrally based settlement pattern, with increased foraging over the preceding phase, is postulated (McGregor and Bruseth 1987:246). The most common projectile points used during this phase were Perdiz and Cliffton. Grog-, grit-, and bone-tempered ceramics continued to be used but with an increase in engraved designs and a decrease in punctated ones. A reduction in the variety of animal species exploited along with an increase in the importance of deer is suggested by faunal remains recovered in features. Maize makes its appearance in the RCAP area during this phase but does not appear to represent a significant component of a subsistence strategy based largely on hunting and gathering wild resources. Hickory, Psoralea, and acorn are the most common plant remains recovered from St. Elmo phase components.

Eleven Late Prehistoric components were excavated at the Jewett Mine by Prewitt and Associates (Fields 1995). Arrow points, most commonly Perdiz, outnumbered dart points by a factor of almost two to one at these sites. The ceramics of this period appear to have either a sandy paste or kaolin paste. The decorative motifs represented are often similar to those prevalent in the Caddo area, farther east. The majority (96 percent) of the ceramics recovered from these components were tempered with either grog or bone. Another Late Prehistoric component at the Jewett Mine (41FT425) that was subjected to data recovery investigations yielded Perdiz arrow points and ceramics with motifs similar to Caddo types including Pennington Punctated-Incised, Crockett Curvilinear Incised, and Canton Incised (Gadus et al. 2002; Sherman et al. 1998). Northwest of the mine area, at the Peerless Bottoms site (41HP175) in Hopkins County, Fields (1995) noted the presence of two ceramic vessel forms typical of the Southern Plains, as well as some sherds with Caddo motifs.

Two Late Prehistoric components were excavated at the Gibbons Creek Mine (Rogers 1995a) that appear to represent short-duration seasonal occupations. Ceramics with Caddo motifs were also recovered from both of these sites. One of these (41GM282) appears to have resulted in part from intensive subsistence processing activities with an apparent emphasis on the exploitation of deer. At that site, 100 complete or near-complete Perdiz arrow points and 25 Perdiz preforms were recovered.

HISTORIC INDIANS

The accounts of early explorers in Texas indicate that the Hasinai Caddo and the Kichai Wichita (who spoke a Caddoan language distinct from the Wichita) were present to the northeast and northwest, respectively, of the Kosse East Mine Area (Bolton 1970; Newcomb 1993). Historically, the Caddo area consisted of large portions of northeastern Texas, northwestern Louisiana, southwestern Arkansas, and southeastern Oklahoma. The Caddo “exerted considerable influence and perhaps dominance over the natives of Central Texas” (Newcomb 1993:3). Fray Francisco
3. Previous Archeological Investigations and Cultural Context

Casañas de Jesús María noted the Tonkawa (Tanquaay) in Texas in 1691 as enemies of the Hasinai Caddos (Swanton 1942).

When first encountered by Europeans, the Caddo consisted of approximately 25 tribes that were organized into four confederated groups, identified by Swanton as the Hasinai (in Nacogdoches, Rusk, Cherokee, and Houston counties), Kadohadacho (on the Red River), Natchitoches (around the present-day city of Natchitoches, Louisiana), and Yatasi (between the Kadohadacho and Natchitoches). The first direct contact was through the DeSoto-Moscoso Expedition of 1541-1542, when a number of tribes were discovered living near the great bend of the Red River (Swanton 1942). The Caddo were an agricultural people organized in economic units of extended matrilocal families living in scattered hamlets with access to soil suitable for agriculture (Woodall 1969). Subsistence crops included maize, beans, calabash, watermelon, and sunflowers (Hatcher 1927). The diet was supplemented by hunting game.

By 1835 Caddo populations to the northeast ceded all their lands in the United States and moved into Texas. Other Indian tribes also began to move into Texas and the Caddo territory. Remnants of the Caddo were forced to move to the Brazos Indian Reservation before eventually being removed to Indian Territory.

The Wichita were originally natives of the Canadian and upper Red rivers but moved southward around 1700 to eventually inhabit the territory between the Brazos and Trinity rivers (Bolton 1914). The Wichita Confederacy was comprised of four subtribes, the Wichita proper, Waco, Tawakoni, and the Kichai (Douglas 1932; Newcomb 1993). The "prehistoric origins of the Kichai lie to the north in the Arkansas River basin" (Newcomb 1993:30). The Kitchai spoke a Caddoan language distinct from that spoken by the Wichita, one that may be more closely related to Pawnee (Newcomb 1993). During the nineteenth century, they became affiliated with and were eventually absorbed by the Wichita.

Bénard de la Harpe encountered the Wichita around the upper Trinity and Canadian rivers in 1719 (Hodge 1959; Wedel 1971). Athanase de Mézières noted a Kichai village near the Trinity and on the right bank of the Brazos near present-day Waco (Bolton 1914). The Kichai occupied the area in present-day Anderson, Houston, and Leon counties into the nineteenth century (Newcomb 1993). The Wichita diet included buffalo meat, cultivated vegetables (such as maize, squash, melons, beans, peas, and pumpkins), and gathered fruits, nuts, berries, and seeds (Douglas 1932; Johnson and Jelks 1958; Witte 1938). On the buffalo hunt, the Wichita lived in hide tipis; they also constructed more-permanent beehive-shaped grass structures.

Norteno focus is used to describe historic Kichai components dating to the early historic period (Duffield and Jelks 1961). The Pearson site (41RA5) in Rains County was described as "largely a mixture of Plains and Caddoan elements" (Duffield and Jelks 1961:75). Norteno focus sites often contain European trade goods in association with triangular arrow points and Emory Punctated
and Womoc Engraved pottery. The ceramics are usually sand or clay-grit tempered, though shell was also used as a tempering agent. The Vinson site (41LT1) in northern Limestone County is a Norteno focus site excavated by The University of Texas at Austin and the Texas Archeological Society, as well as local groups. Preserved house patterns along with English and French trade items were found on-site (Smith et al. 1993).

The Tonkawa homeland was in north central Oklahoma. In the seventeenth century, Apache expansion forced the Tonkawa from their homeland, and they began to move south into north central Texas (Newcomb 1993). The Tonkawa were hunter-gatherers and ranged widely depending on the availability of game and their relationships with other tribes. During the eighteenth century, they were reported between the Brazos and Trinity rivers. Tonkawa were also reported at Rancheria Grande, near Cameron, Texas, south of the Kosse East mine area. Relations with other tribes continued to force the Tonkawa south, and by the nineteenth century, they were reported to be between the Trinity and San Antonio rivers (Newcomb 1993).

By the end of the eighteenth century, remnants of eastern tribes including the Shawnee, Delaware, Kickapoo, and Cherokee moved west after the advance of Anglo settlement and passed through central Texas (Newcomb 1993).

EUROPEAN ACTIVITY IN ROBERTSON AND LIMESTONE COUNTIES DURING THE COLONIAL PERIOD

Spanish claims on the area comprising present-day Robertson and Limestone counties extend back to the sixteenth century, though there is no evidence that any of the documented French or Spanish expeditions into east and central Texas during the sixteenth, seventeenth, and eighteenth centuries passed through the region during the era of exploration. During the late eighteenth century, the Spanish became increasingly concerned with French encroachment into their outlying territories, including East Texas, and authorized the establishment of permanent settlements across the region. None of the subsequently constructed presidios or missions was in Robertson or Limestone counties, but one, Nuestra Señora del Pilar de Bucareli was founded where the Old San Antonio Road crossed the Trinity River southwest of the project area. While Bucareli is important because it represents the first attempt by any European group to settle in this section of the state, permanent settlement did not occur until Anglo-Americans from the United States reached the area in the 1820s and 1830s (Sherman et al. 2006).

THE ROBERTSON COLONY AND EARLY ANGLO-AMERICAN SETTLEMENT IN THE PROJECT VICINITY

The early years of the nineteenth century marked a turning point in the history of Limestone County, as Mexico gained its independence from Spain, Anglo-American settlement began, and conflicts with Native American tribes continued. During the first decades of the century, Anglo-Americans reached territory that encompasses present-day Limestone and Robertson counties for
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the first time. Zebulon Montgomery Pike's expedition through Texas in 1807 marked the beginning of Anglo-American involvement in the region. In 1812–1813, the Gutierrez-Magee Expedition, established to help Mexico gain independence from Spain, exposed east central Texas to still more Anglo-Americans. In 1819–1820, James Long led an unsuccessful expedition against Spanish forces in Texas.

As early as 1822, Anglo-American settlement in what now comprises Robertson County was reported for the first time. William B. De Wees, as a member of Stephen F. Austin's Old Three Hundred settlers, wrote that two families were building homesteads near the crossing of the Old San Antonio Road over the Brazos River. In all likelihood, this small settlement was not approved by the Mexican government and was merely a group of squatters with no legal rights or claims to the land. This trend continued even while formal permission to settle the region was under way and caused considerable controversy and legal problems in later years.

The first organized and government-sanctioned efforts by Anglo-Americans to settle in the region date to 1821 when the Texas Association, forerunner of the Robertson Colony, was officially chartered in Nashville, Tennessee. Amid political turmoil within the Mexican government and growing tensions between Mexico and Anglo-American settlers, the claims and efforts of this colony became confused with those of the Nashville Company. Subsequent attempts to establish permanent settlement were less than successful and few, if any, surviving settlements were established. However, in June 1830, Sterling C. Robertson and Alexander Thomas agreed to bring 100 families to the Leftwich Grant.

The Leftwich Grant, from which both Robertson and Limestone counties were created, was initially part of two empresario grants made by the Coahuila y Texas legislature in 1825 to Hayden Edwards and Robert Leftwich (Maschino 2011). The grants authorized the men to settle 800 families each within the boundaries of their individual holdings. The Leftwich Grant was also known as the Nashville Colony, the upper colony, and in its final incarnation as Robertson's Colony. After much wrangling, Leftwich eventually secured a contract with Mexico to bring settlers into Texas in his own name. He subsequently sold the contract back to the organization he had originally been working for, a Nashville-based group known as the Texas Association, with the stipulation that the colony bear his name. It was one of the group's original stockholders, Sterling Clack Robertson, along with his partner Alexander Thompson Jr., who undertook the daunting task of recruiting colonists under the contract in 1830 (McLean 2011). Unlike others who tried before him, Robertson eventually overcame many obstacles to make the operation a success.

By 1830, the Mexican government was becoming increasingly alarmed at the growing number of Americans immigrating to Texas from the United States and the influence they had over the region. In reaction, they implemented a policy designed to reassert their control, which became known as the Law of April 6, 1830. The most controversial articles of the legislation annulled incomplete empresario land grants and called for a halt to United States immigration to Texas. While Stephen F.
Austin successfully argued for a reinterpretation of the law and eventually helped to amend major provisions, the grants to the Texas Association remained suspended. Believing that the law had halted activity by the group, Austin and his agent, Samuel M. Williams, secured the rights to the Leftwich Grant from the Mexican government (Sherman et al. 2006). Consequently, between 1831 and 1834, Leftwich’s Grant was referred to as the upper colony, and Austin and Williams proceeded to “sell permits to nonresident speculators to locate huge grants in the area.” This action by Austin caused conflict between him and Robertson, as well as between potential colonists, which, along with the constant threat of Indian raids, worked to impede settlement in the region for many years (McLean 2011).

After years of legal tribulations, Robertson finally regained his contract on May 22, 1834. In the same decree, he was named as the colony’s empresario and was given until 1838 to introduce the remainder of his 800 families into the area (McLean 2011). He successfully brought approximately 600 families into the colony by the deadline, but few if any settled in the project vicinity during this early period. The slow rate of settlement was due in large part to fear of local Native American groups. In 1836, Comanche and Kiowa warriors raided and destroyed the earliest Anglo settlement in Limestone County, known as Fort Parker. In the aftermath of the legendary raid, settlement in the region was halted until Sam Houston initiated a treaty with the Native Americans in 1844. Two years later, Limestone County was formed out of northern Robertson County, and settlement began in earnest (Maschino 2011).

Upper Southern Anglos represented the principal settlers in the project vicinity during the mid-nineteenth century. Like in adjacent counties, both large and small landowners from the Upper South migrated to Robertson and Limestone counties throughout the 1850s. These cultural groups brought with them traditions and customs derived from the plantation-slave system of the southeastern United States (Sherman et al. 2006). Though both slavery and the mentality to support such a system existed among most of the counties’ settlers, natural barriers and the isolated nature of the area prevented the plantation system from existing on the same scale as in other regions. Most of the early settlers were “self-sufficient farmers” who “cultivated corn and wheat and raised cattle and hogs.” Despite their lack of participation in the plantation-slave system, the vast majority of the area’s early inhabitants strongly supported its continued existence. This belief is evidenced by the overwhelming participation of local men in the Confederate cause during the Civil War (Maschino 2011).

Community development in the project vicinity began during early Anglo settlement in the county. Early settlers Joseph and Hannah Ferguson, who patented a large land grant near the current project area, are credited with being the founding members of the Oletha community, which is located approximately 2 miles from site 41LT424. The Ferguson family moved to the area in the 1830s, prior to the formation of Limestone County, and claimed a large tract of land that included the present-day communities of Box Church and Oletha. The Ferguson Cemetery that continues to serve local residents was named after the family, and both Hannah and Joseph Ferguson are
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POSTBELLUM DEVELOPMENT

Economic depression and sometimes-violent resistance to Republican Reconstruction characterized the postbellum era in Robertson and Limestone counties. Despite the political and social upheaval, the region remained rural and economically dependent upon agriculture. In 1869, the Houston and Texas Central Railroad arrived in Limestone County, ending where the town of Kosse is currently located approximately 10 miles southwest of Oletha. The railroad ran north-south across the county, and the town of Thornton, situated approximately 10 miles west of Oletha, was one of several towns established along the line. The slow and unimproved transportation lines of the past had hampered economic growth, but the arrival of the railroad offered many new opportunities and possibilities to local residents. Farmers whose yield increased dramatically during the late nineteenth century shipped their goods to markets that had previously been inaccessible or unprofitable. With their increased wealth, many of these farmers expanded their purchase of goods from local stores, and merchants carried a greater variety of goods that had been too expensive or difficult to obtain in the prerailroad era. The railroad also physically linked the region to much of the rest of the nation, thereby helping to bring the area out of its isolated and economically depressed state and attracted new residents to the area. In Limestone County, the population increased from 8,581 in 1870 to 16,246 by 1880 (Maschino 2001). Simultaneously, existing communities bypassed by the railroad, such as Oletha and nearby Headsville, dwindled.

Besides the general impetus provided by railroad construction, the county’s newly freed African American residents also participated in community development during the postbellum era. In some cases, black residents consolidated themselves into ethnic enclaves that in time developed into self-sustaining communities with their own churches and schools. These communities were often in areas that were considered undesirable by white residents and tended to be far-removed and isolated from existing communities and railroad access. This pattern is apparent in the project vicinity, where African Americans were prohibited from settling in the area surrounding the Oletha community.

The arrival of the railroad also encouraged limited industrial development such as pottery making and petroleum extraction during the early 1900s; however, agriculture, particularly cotton cultivation, continued to be the county’s economic mainstay well into the twentieth century. Local residents began to experiment with cotton cultivation in the 1880s. During the same period, improvements were made in the process of refining cotton, such as Robert S. Munger’s
development of a continuous ginning system in nearby Mexia (Britton 1992). Ray Walter reports in his *History of Limestone County* that between 40 and 50 cotton gins were located in the county at one time with nearby examples at Ferguson Prairie, Kosse, Mexia, and Groesbeck (Walter 1959). Deed records from the period indicate that there was also a cotton gin in Headsville that operated at least during the 1880s (Robertson County Deed Records 14:245).

Within the current project vicinity, archival evidence suggests that many residents engaged in self-sustaining rather than commercial agriculture and practiced ranching on a small but more-industrious scale. The decision to ranch instead of commercially farm may have been based partly on soil quality, but was also likely supported by the relatively low cost of beef cattle, which sold for a few dollars, and the minimal expense involved in raising them (Walter 1959).

**THE CERAMIC INDUSTRY IN LIMESTONE COUNTY**

During the nineteenth and early twentieth centuries, Limestone County was home to numerous pottery-producing kilns of various sizes and production capacities. This early industrial development was due in large part to the presence within the county of a number of significant outcroppings of kaolin, or potter's clay, found within the limits of the Wilcox Formation. Researchers at the University of Texas conducted several studies of this resource during the early twentieth century. Heinrich Reis, in his *Clays of Texas* (1908), discussed the various types of clay found in northern Robertson and southern Limestone counties. A.D. Potter and David McKnight continued this analysis in *The Clays and the Ceramic Industries of Texas* (1931). Reis identified significant clay deposits in Robertson County at Bremond, in Falls County at Denny, and in Limestone County near Headsville (Potter and McKnight 1931; Reis 1908).

The Bureau of Economic Geology at The University of Texas studied these formations further as part of a Works Progress Administration survey in 1936. In the study, the author described the deposit as located:

2½ miles east of Kosse northward to a point 7 miles southeast of Groesbeck and north to points about one-half mile east of La Salle and Fallon respectively. The formation enters Freestone County at a point nearly 17 miles from the Leon-Limestone County line. The width of this deposit is about 3 miles ... there is a repetition of these characteristic sands and clays farther toward the southeast in the county. This repetition takes place from a line drawn 2 miles west of Oletha to a point about 3 miles northwest of Farrar. ... The width of this belt is from 2 miles near Oletha to about 3 miles going northeasterly. (Broman 1936)

The availability of such quantities of clay resulted in the emergence of an important pottery-manufacturing element in Limestone County that existed alongside and in support of the more prevalent agricultural sector (Broman 1936; Kotter et al. 1988). Sources indicate this industry was influenced by the Anna Pottery school of Illinois, with at least one of its key artisans having trained at the Anna Pottery. The work of these artisans, including J.L. Stone and Wm. C. Knox, reflects folk
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art traditions established there by founders Wallace and Cornwall Kirkpatrick (Zipp 2010). The Anna Pottery operated from 1859 to 1896 (Zipp 2009), which roughly correlates to the period of significance for pottery production in Limestone County, and archival evidence indicates that J.L. Stone maintained ties with the Kirkpatrick family throughout this period (Zipp 2010).

Although there were several kilns located in the area, Alberry Johnson was likely the first to establish a pottery in Limestone County. Information in the Texas Historical Marker files indicates that Johnson began his business in the late 1850s on the Springfield and Pottersville Road at Dooley Creek. The South Carolina native is indexed as a "potter" in the 1860 Limestone County census, which helps to confirm this approximate date. Like other local and regional potters, the Johnson kiln was of the groundhog variety popular in the southern United States during the late nineteenth century. The outline of the kiln was still visible when archeologists recorded the site (41LT122) in 1978 (Glander et al. 1984; Kotter et al. 1988:75; THC Historic Sites Atlas 1967).

Groundhog kilns gained prominence in the nineteenth century and were used in the manufacture of "alkaline glazed pottery." Folklorist Charles G. Zug III describes the groundhog kiln as "semi-subterranean" with a doorway leading to a long underground passage constructed of brick or rock known as the "ware-bed." At the end of the passageway, a chimney rose out of the ground. Workers loaded the ware into the ware-bed and built a fire in the "sunken firebox" outside of the doorway to the passage. The heat from the fire was "drawn" through the passage by the chimney and "burned the pottery inside" (Zug 1986:401).

A 1984 interview with Dr. Georgeanna Greer, an expert on nineteenth-century pottery making in Texas, revealed some useful specifics about small-scale potteries in east Texas. According to Dr. Greer, the shop where the vessels were shaped and formed usually consisted of a log cabin with a dirt floor located near the kiln. In most of the small-scale operations, the shop owner usually employed three to five persons. If he was not the master potter, one of his employees held that position and was responsible for designing the vessels and supervising the shop. In addition, there were one or two turners working under the master potter, and one or two persons employed in plugging the clay. This process involved cutting a ball of clay with wire and squeezing it repeatedly to draw out the air pockets. Few potters relied solely on their craft for their livelihood. They often engaged in farming as well and lived near their shops (Greer 1984).

Alberry Johnson's shop was likely similar in scale to the operations described by Dr. Greer. Johnson operated his shop for approximately 10 years (ca. 1869) before he reportedly sold it and his equipment to William Curtis Knox (Table 2). Knox subsequently moved the equipment to a site about 2 miles northwest of the present town of Oletha in an area that became known as Pottersville (41LT11) (Figure 2). He then hired J.L. Stone as his chief artisan. There is no record of Knox's purchase of the land because the Limestone County courthouse burned in 1873, but the graves of Knox's wife Minerva and her son Charles E. Knox are marked 1871 in the associated Potter's Shop Cemetery, indicating that Knox owned the land by 1871 at the latest (Kotter et al. 1988:75–76;
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Panus 2011). Furthermore, Knox is enumerated as a “potter” in the 1870 Limestone County census, providing additional confirmation of the circa 1869 purchase date.

Table 2. Summary of Historic Potteries in the Project Vicinity

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Owner/Operator</th>
<th>Approximate Years of Operation</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>41LT122</td>
<td>Alberry Johnson</td>
<td>1859–1869</td>
<td>Equipment was moved to the location of 41LT11 after 1869</td>
</tr>
<tr>
<td>41LT197</td>
<td>Louie and Douie Stone (sons of J.L. Stone)</td>
<td>1915–1925</td>
<td>The Stones' father was the chief artisan at the Knox/Fowler pottery; approximate dates of operation based on archeological analysis</td>
</tr>
<tr>
<td>41LT11</td>
<td>William C. Knox (1869–1873); John Fowler and son Eugene (1873–1912)</td>
<td>1869–1912 (under two owners)</td>
<td>Chief artisan J.L. Stone and William Knox maintained a possible connection with the Anna Pottery School of Illinois; under Fowler, shop employed up to 60 workers</td>
</tr>
<tr>
<td>41LT441</td>
<td>H.H. Stephenson (1860s–1890); W.S. Roberts and T.F. Thames (1890–1900); P.K. McKenzie (post-1905)</td>
<td>Late 19th and early 20th centuries</td>
<td>The kiln located near Oletha may also have been controlled/operated by Joseph Allman who served as the guardian of Stephenson’s heirs and owned the quarry at 41LT424</td>
</tr>
<tr>
<td>41LT198</td>
<td>Lee Kimik</td>
<td>1875–1883</td>
<td>Small-scale operation associated with the community of Headsville</td>
</tr>
</tbody>
</table>

Extant examples of J.L. Stone’s work are so similar in character to pieces produced at the Anna Pottery in Illinois during the same time period that modern ceramic scholars have conducted research to identify connections between the Limestone County pottery-manufacturing industry and the Illinois-based Anna Pottery. Stone’s decorative pieces, including a work simply called the “temperance snake jug,” are “closely related to very similar vessels made by the famous brothers, Wallace and Cornwall Kirkpatrick, at Anna Pottery, in Anna, Union County, Illinois.” Research revealed that Stone likely apprenticed at the Anna Pottery beginning circa 1863 when he was 13 years old. There he learned his trade and formed a lifetime friendship with the Kirkpatrick family. Stone immigrated to Texas circa 1869 where he began working for Wm. C. Knox, who was also from Illinois and may have been connected to the Kirkpatrick family in some way (Zipp 2010).

An apparent journal entry authored by Stone indicates he worked in the Pottersville shop until October of 1877. During the period, he received 3.5 cents “and board per gallon to turn ware.” He moved out of Limestone County briefly from October 1877 through March 1878 before returning to work at the Pottersville shop through October 1883. After 1873, Stone worked for new owner John Fowler of Redding, Pennsylvania (THC Historic Sites Atlas 1967).
Figure 2
Regional Potteries in the Vicinity of 41LT424

Prepared By: Atkins/19895  Scale: 1" = 2 miles
Job No.: 100016087  Date: April 20, 2011
File: N:\Clients\L.K.Luminant\Kosse\100016087\geo\figs\41LT424_kilns.mxd
3. Previous Archeological Investigations and Cultural Context

Though deed evidence indicates that Fowler did not officially own the property containing the Potter's Shop until 1883 (Limestone County Deed Records 13:441), Stone's account of his association with the Potter's Shop indicates Fowler had owned the facility for 5 years by the time of his return to the shop in 1878. Similarly, a copy of a conveyance of the property notes that Fowler had "held and been in possession" of the tract for "more than ten years under bond" (THC Historic Sites Atlas 1967). This information correlates with local census records in which Knox is enumerated as a "farmer" in 1880 (Zipp 2010). Similarly, his pottery does not appear in the 1880 products of industry schedule.

Fowler, and later his son, operated the Potter's Shop through the early twentieth century (Limestone County Deed Records 38:564). Fowler died in 1910, and the shop closed circa 1912. According to Stephanie Panus, the shop was once "...one of the largest of its kind in Texas ...employing as many as sixty workers" (Panus 2011). Its size and longevity, as well as the diversity and quality of its products, made the kiln unique in the region. Former workers recalled that the facility produced "many varieties and sizes of crockery and earthenware" including "jugs, jars, churns, pitchers and flower pots," as well as "decorative wares such as flower stands and vases" and "miniature brown jugs" (Unknown 1968). An Official State Historical Marker (OSHM) erected in 1967 currently commemorates the "Old Potter's Shop," and the archeological component (41LT11) was recorded in 1973 (Kotter et al. 1988:75–76; Panus 2011).

There is also evidence that J.L. Stone worked for another large-scale pottery manufacture operation in Kosse during the late nineteenth century. The Kosse Fire Brick and Tile Company operated from circa 1875 through 1890 and produced brick, tile, and stoneware. Industrial census evidence indicates that the facility employed approximately 100 individuals in its various divisions in 1880. As evidenced by a jug Stone crafted and presented to the company, the Kosse Fire Brick and Tile Company was likely founded and operated by J.P. Johnson and J.W. Dillon. The men, who were identified as the jug's recipients on an attached plaque, were also described as "manufacturers of all kinds of stoneware." According to 1880 census data, Dillon was a merchant and hotel owner in Kosse and his apparent partner, J.P. Johnson, worked as a "Brick Mason." In that year, "three potters, another pottery worker, and one brickyard worker" resided in Dillon's hotel. Altogether, there were approximately "seventeen potters or pottery workers operating in Kosse" in 1880 (Zipp 2010).

Stone relocated to Washington State by 1892 but returned to Texas by the turn of the century. He was working at the Athens Pottery Company in Henderson County by 1910. Stone lived in Washington and Los Angeles in subsequent years but returned to Limestone County before his death in 1928 (Zipp 2010). According to a local informant, Stone's twin sons Louie and Douie Stone operated a pottery near the Robert's Cemetery Road during the early twentieth century (41LT197) (see Table 2). This facility was located approximately 2.5 miles northeast of Farm-to-Market Road (FM) 937 near Old Union (see Figure 2). This information has not been confirmed by primary documentation, and while J.L. Stone's relationship to the operation is unclear, the kiln at this site...
3. Previous Archeological Investigations and Cultural Context

was unique in the area, as it was of the round updraft or simple beehive type more common in the northern United States. J.L. Stone’s documented relationship to the Illinois pottery industry suggests he would have been familiar with this kiln configuration and could have shared the information with his sons. Archeologists estimate that the kiln was active from 1915 through circa 1925 (Kotter et al. 1988:76).

In addition to the Johnson/Knox/Fowler operations and the Kosse Fire Brick and Tile Company, there were at least two other potters’ shops located near or outside of the town of Kosse during the late nineteenth century. John Dimelow, an Englishman, and John W. Moss built an experimental pottery kiln in the area circa 1870. Informants also indicate that there was a potter’s shop on the Betty Hohn farm east of Kosse during the same period (Glander et al. 1984:49). Another ceramic manufacture facility, the Kimik kiln and pottery (41LT198), operated near Headsville from approximately 1875 to 1883 (see Figure 2). The small-scale operation owned by German immigrant Lee Kimik supplied local residents with affordable utilitarian wares and building materials. Although he used a groundhog kiln, Kimik’s design had longer and deeper side walls than the traditional southern configuration. Dr. Georgeanna Greer revealed that the unusual design of the kiln reflects Old World German architectural influences not typically seen in Texas (Kotter et al. 1988:77).

Finally, archeologists recorded remnants of another kiln operation near Oletha in 2009 (41LT441) (see Figure 2). This facility likely operated contemporaneously and/or subsequent to the Pottersville operation as a kiln as one is depicted in the general vicinity on a 1919 Limestone County highway map. As the Potter’s Shop reportedly closed in 1912, this facility likely represents site 41LT441. Preliminary archival research suggests the facility may have been constructed by H.H. Stephenson (1860s through 1890), W.S. Roberts and T.F. Thames (between 1890 and 1900), the latter of whom married Stephenson’s widow after his death, or P.K. McKenzie, a merchant who purchased the property in 1905 (Dixon et al. 2010). The facility may also have been operated by Joseph Allman, who served as the guardian of Stephenson’s children after 1900. Tax records provide evidence that Allman was engaged in industrial and commercial activities, and he owned the possible kaolin quarry recorded at site 41LT424. It is unclear how long this facility operated, but it appears to have been a crossdraft “groundhog” kiln similar in format to those recorded at several other kiln sites in the area (for more information about this history of this facility, see the site-specific history for 41LT424 in Chapter 11).

As evidenced by the preceding brief summary, commercial pottery production in Limestone County formed a significant part of the local economy for at least 60 years until its ultimate decline during the advent of the automobile era. Though it never characterized economic development in the same fashion as agriculture and later mining, archival and archeological evidence suggests that the industry promoted community development (i.e., Headsville, Oletha, and Pottersville) and fostered economic and social connections among local residents who acquired and used local wares, sold the wares in local stores, transported the wares to market, and sold raw materials to ceramic
manufacturing facilities. County residents supplemented their agricultural income through their involvement in some aspect of production, transport, supply, or sale of the wares or raw materials and were less dependent on outside markets for household goods and building materials due to the availability of locally produced items. As a result, study of the history of ceramic production in the county reveals information about the daily life of historic residents and supplements previous historical studies of the area that focus primarily on the role agriculture played in the region’s historic development.

In addition to utilitarian wares, sources indicate that at least some of the industry’s artisans, particularly J.L. Stone, produced “true art works” (Zipp 2010). The apparent relationship of such works to the Anna Pottery, a prominent pottery school in the northern United States, suggests that the region’s raw materials must have been perceived as significant in order to attract potters such as Knox, Stone, and Fowler to the area. This broader connection with nineteenth-century stoneware manufacture in the United States is significant and provides a new perspective within which to consider the industry in Limestone County as “the artistic legacy of the Anna Pottery school of stoneware potters” (Zipp 2010). Additionally, this link implies there could have been a broader market for Limestone County wares and could explain why so many distinct potteries operated in such a small geographic area during overlapping time periods. Aside from utilitarian goods, extant examples of stylized wares indicate the facilities could have catered to a market that included collectors of the objects themselves, a previously unexplored aspect of the Limestone County pottery manufacturing industry.

**HEADSVILLE**

Headsville was a small rural community in Robertson County that existed during the late nineteenth and very early twentieth centuries. It differed from adjoining rural communities such as Willow Creek (Robertson County) and Heads Prairie (Limestone County), which were merely collections of farmsteads with schools as the primary focal point. Instead, Headsville was better defined and perhaps had a greater sense of identity, which may explain why the name Headsville has survived even though virtually all physical remains have disappeared.

The origin of the community’s name cannot be verified and remains something of a mystery. The earliest known association of any member of the Head family involved E.E. Head who owned property in the Jarrett Young Survey as early as the 1880s. Joseph R. Adams and Rueben O’Neal, both of Limestone County, owned most of the land that eventually comprised Headsville. At its peak in the late nineteenth century, the community could claim a gin (41RT416), a drugstore (41RT415), another store (41RT364—possibly a general store), and a blacksmith shop (41RT413). All were clustered along a bend in the “Headsville” Road, just east of its intersection with the old “Thornton Road,” and were surrounded by small farmsteads.
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Despite efforts to the contrary, Headsville was never a prosperous community. All of the businesses struggled to survive, and most changed hands many times during the late nineteenth and early twentieth centuries. One reason for the eventual death of the town can be traced to the hard conditions that existed at that time. The land on nearby farms was not as fertile as other areas in Robertson and Limestone counties and the yields were not as great. As a result, local residents had little extra revenue to spend, and economic activity remained limited.

Another factor that influenced Headsville's development was its location. Kosse, located about 8 miles northwest, was served by the railroad. That town consequently became a regional hub, and most residents went to Kosse to buy the majority of their provisions. While the founders of Headsville possibly envisioned their town as a secondary commercial center in the region, these dreams were never realized. By the second decade of the twentieth century, all of the commercial establishments were abandoned, and little evidence of their buildings remains.

TWENTIETH-CENTURY DEVELOPMENT IN LIMESTONE COUNTY

Despite the existence of industries such as ceramic production during late nineteenth and early twentieth centuries, agriculture, including cultivation and ranching, continued to be the county's economic mainstay well into the twentieth century. The limited economic diversification, coupled with increased cotton production, resulted in continued population growth in Limestone County through the first decades of the twentieth century (Maschino 2011). During this period; however, the community of Oletha declined, and by 1915, its population had decreased to approximately 75 residents (Panus 2011).

This pattern of steady growth in Limestone County changed as a result of the Great Depression of the 1930s, which disrupted the tenant farming system relied upon by local cotton producers. As tenants left the area in search of work, the agricultural population and agricultural production declined dramatically. This decline continued throughout the rest of the century, with slow improvements manifesting in recent decades (Maschino 2011).

Though affected by the Depression, the population of Oletha remained comparable to what it was in the early twentieth century. Several businesses closed, and local stories abound of rampant moonshining in the area (Panus 2011). In 1934, several rural schools in the vicinity of the project area joined together to form the Oletha Common School. Originally offering education to grades one through eleven, the school census began to decline in 1948, and the number of students continued to taper off until 1962 when the school was officially closed (THC Historic Sites Atlas 2003).

Limestone County never recovered the population that it had prior to the Great Depression, and the number of residents, farms, and businesses steadily declined through the 1970s. The last few decades of the twentieth century saw some growth in jobs related to retail and construction. Presently Mexia, the most populous town in Limestone County, has a population of around 6,600. Oletha and many of the small rural communities in the vicinity of the project area continued to
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decline along with the rest of the county, and today only a few residents remain in Oletha. Ranching
continues to be economically significant in this portion of the county, and more recently the mining
industry has developed in the area (Maschino 2011).
METHODS

FIELD METHODS

A multiphase approach was utilized to determine the NRHP eligibility status of the tested sites where the results of each phase were used to determine the necessity of subsequent phases. Additional shovel testing, backhoe trenching, and hand unit excavation were utilized at sites 41LT56, 41LT310, 41LT387, 41LT397, 41LT415, 41LT422, 41LT424, and 41RT413. A magnetometer survey was conducted across site 41LT424 and on subsite areas within site 41LT56. Only shovel testing was conducted at site 41LT425.

Horizontal Control

For sites with dense vegetation, a 20-meter (m) grid was established with a compass and tape. The locations of all shovel tests, trenches, and excavation units were recorded with a Trimble hand-held Global Positioning System (GPS) unit that is accurate to between 2 and 5 m in the field. With post-processing, 1 m accuracy is obtainable. For sites that were in open pasture, a 20-m grid was established with a total station, and all shovel tests, trenches, and hand-excavated units were tied to the grid with the total station.

Shovel Testing

Additional shovel testing was proposed for all of the sites. Each site was initially shovel tested at 20-m grid intercepts. If artifact high density and diversity areas were located through this effort, each such area was subjected to intensive shovel testing at 10-m grid intercepts.

Magnetometer Survey

A magnetometer survey was conducted across site 41LT424 and on select areas within site 41LT56. Atkins used a Geometrics Inc. G-858 Magmapper to provide continuous magnetic surveying and automatic data logging. The G-858 automatically stores and outputs each sensor reading and the difference between the two sensor readings. In continuous mode, the G-858 can record data at 0.10-second intervals and store readings and positions sequentially with a time stamp. The gradiometer mode automatically removes the regional gradient and increases the resolution of local anomalies. Measurements of the magnetic field are recorded automatically by the magnetometer at 0.10-second intervals.
4. Methods

The magnetometer surveys at 41LT56 and 41LT424 were conducted within controlled metric grids. Four sensors were mounted to a nonmetallic cart, spaced horizontally at 0.5 m. Horizontal positioning was maintained during the surveys with a GPS device attached to the cart. Two locations within site 41LT56 were selected for magnetometer survey based on shovel-testing results. The northern grid (Area 1) extended 100 m by 100 m, and the southern grid (Area 2) extended 60 m by 60 m. The area surveyed at site 41LT424 was irregularly shaped and comprised roughly 7,360 m².

At the completion of the magnetometer survey, the data stored internally were transferred to a computer and processed using MagMap2000 software. The magnetometer files were then exported from MagMap2000 in a format compatible with SURFER, a terrain-modeling software package, and magnetic contour and shaded relief maps were produced.

Mechanical Excavation

A backhoe with a smooth blade affixed to the bucket was used to prospect for features in high artifact density areas located through shovel testing. Backhoe trenches roughly 10 m long were excavated at 20-m intervals across high artifact density areas. If a feature was encountered during this effort, mechanical excavation was halted and a representative sample of the feature was sampled with hand-excavated units. To the extent the terrain and vegetation allowed, all mechanical excavation units were aligned with the grid. At sites 41LT56 and 41LT424 a backhoe was also used to sample anomalies identified with the magnetometer that had the potential to represent cultural features.

Hand Excavation

Hand-excavated units were used to gather data from cultural features identified on sites. All nonfeature sediment removed by hand excavation was screened using ¼-inch (0.635-cm)-mesh hardware cloth. Burned rock features were first exposed, mapped, and photographed. Next, the features were bisected to reveal their construction in profile. Samples of feature matrix were collected for flotation.

LABORATORY METHODS

All recovered cultural materials were returned to the Archeological Laboratory at Atkins for processing preparatory to analysis. Nonorganic remains were washed, dried, and catalogued by provenience. The Texas Archeological Research Laboratory (TARL) at The University of Texas at Austin is expected to be the curation repository.
4. Methods

**Prehistoric Artifacts**

The methods used to evaluate the lithic assemblages recovered during NRHP testing from sites 41LT56, 41LT310, 41LT387, 41LT397, 41LT415, and 41LT422 sought to identify potential cultural sources of patterned assemblage variability. This was accomplished by applying an interpretation-neutral and mutually exclusive lithic typology based on morphology. Additionally, morphological characteristics that can be expected to result from use and thermal alteration were also recorded.

All lithic materials were classified by raw material type. Lithic artifacts exhibiting traits characteristic of thermal alteration were examined in detail in an effort to distinguish intentionally heated materials from those heated by chance.

The assemblage of lithic artifacts was subdivided into tools and nontools. Tools include both chipped stone and ground stone artifacts that show evidence of use and/or intention. Nontool lithic artifacts are the unutilized byproducts of lithic reduction. All lithic tools were subjected to low-power microscopy in an effort to identify patterned wear consistent with use.

**Raw Material Type**

Raw material types represented in the lithic assemblage include chert, hematitic sandstone, metaquartzite, mudstone, quartz arenite, quartz litharenite, and silicified wood. The selection of raw materials by prehistoric populations appears to have been based primarily on local availability. This conclusion is based on the paucity of clearly imported raw material types as well as the dominance of chert in the assemblage.

**Thermal Alteration**

Traits diagnostic of thermal alteration were noted for each lithic artifact. Thermally altered materials were distinguished based on whether the application of heat appears to have been intentional or unintentional. Attributes characteristic of thermal alteration include color, luster, and fracturing. Specimens exhibiting hues of red, increased luster, and/or fracture patterns consistent with such heat treatment were considered to be thermally altered.

Some lithic raw materials respond well to heat and become easier to work because they fracture more conchoidally and consistently than unheated specimens. This happens because the point-tensile strength of such heated material is reduced (Purdy and Brooks 1971). This is caused by the fusing of impurities with the microcrystals, which allows the material to fracture with less pressure and in a more even and conchoidal manner. This fusing also results in a more lustrous and even surface (Purdy and Brooks 1971). Studies have shown that introducing the materials to controlled temperatures produces color change beginning at approximately 240 degrees Celsius (°C), with increased luster and reduced tensile strength occurring generally between 350 and 400 °C (Purdy and Brooks 1971). Additional work by Frederick and Ringstaff (1994) in Bell and Coryell counties,
Texas has shown an increase in workability of cherts heated to temperatures between 232 °C and 460 °C, with workability peaking at temperatures between 330 °C and 460 °C. These temperature limits will vary slightly depending on the chemical makeup of the individual raw materials.

Unintentional heat alteration is apparent if the specimen exhibits the properties of intentional heat alteration along with abrupt fracturing and an increase in friability. This effect would be caused by exposing the specimens to much higher temperatures for longer periods of time. All material types recovered at the sites are comprised of quartz crystals, which has an upper temperature limit of 575 ± 2 °C, beyond which the specimen would undergo disintegrative effects (Rogers 1928). This is not to say that such effects cannot be reached at lower temperatures, as would be the case if the impurities in the raw material have lower temperature limits than that of quartz. Any materials introduced directly to an open-air fire, such as those necessary for the successful firing of pottery, between 600 and 850 °C, would exhibit such breakdown (Rice 1987). Specimens with hues of red or increased luster, along with the abrupt fracturing, are considered to have been unintentionally heated.

**Nontools**

Nontool lithic artifacts recovered at sites 41LT56, 41LT310, 41LT387, 41LT397, and 41LT422 include unmodified lithic debitage and lithic cores. Debitage was further categorized by morphology and by the presence or absence of thermal alteration. The single piece of lithic debitage recovered from site 41LT425 was a small chert flake. It was lost in the field and thus not analyzed further.

Lithic debitage refers to unused, detached manufacturing debris, while core refers to flaked lithic artifacts that show only negative scars of percussion. Following Sullivan and Rosen (1985), debitage was separated into the following categories: complete flake, broken flake, flake fragment, and debris. Complete flakes include all debitage with a discernible single interior surface that retains a point of applied force and has intact margins. Broken flakes differ from complete flakes because they lack intact margins. Flake fragments have a discernible single interior surface but do not retain a point of applied force or intact margins. Debris includes all debitage that lacks all of the above morphology.

Cores are the byproducts of lithic reduction that exhibit only negative scars of percussion. The reduction of cores can be either unidirectional or multidirectional, based upon the recognizable direction from which flakes are removed. Unidirectional cores have flakes removed in the same direction from a single point or area, whereas multidirectional cores have flakes removed in varying directions and from multiple points of applied force. Raw materials were categorized by size, when determinable, as boulder (diameter greater than 256 millimeters [mm]), cobble (diameter greater than 64 mm and less than 256 mm), or pebble (diameter less than 64 mm).
following Neuendorf et al. (2005). Extensively reduced cores that did not retain sufficient attributes to categorize by size are referred to as exhausted cores.

**Tools**

The lithic tool assemblages recovered from sites 41LT56, 41LT310, 41LT387, 41LT397, 41LT415, and 41LT422 were broadly categorized as either chipped stone or ground stone tools. They were subcategorized by morphology and raw material type. The presence or absence of thermal alteration was also noted. The dimensions of each tool were taken with digital calipers. Lithic tools were also examined under low-power microscopy in order to identify patterns of use-wear. The morphological characteristics of projectile points were used to assess manufacturing techniques and identify cultural affiliation when possible.

The assemblage of chipped stone tools was placed into the following categories: projectile point, biface, unifacially modified flake, and utilized flake.

Bifacially worked lithic artifacts with an identifiable hafting element are classified as projectile points. Based on size and manufacturing techniques, these artifacts were further subdivided into arrow points and dart points and assigned a cultural affiliation when possible. Arrow points are small, often finely worked projectile points with a hafting element allowing for attachment to an arrow shaft. Arrow points were then further classified by typology, when possible. Dart points are larger, bifacially worked projectile points with wide bases, moderate to fine thinning, and a hafting element allowing for attachment to a shaft. Such tools generally precede the use of arrow points. All recovered dart points were classified by typology, when applicable.

Bifacially worked lithic artifacts lacking a discernible hafting element are categorized as bifaces. Following Dial and Collins (1998), bifaces were further categorized by reduction phase. Stage 1 bifaces are irregular in outline, retain large amounts of cortex, and exhibit minimal to no thinning along the edges. Stage 2 bifaces are more symmetrical in outline, retain minimal to no cortex, and exhibit minimal thinning. Stage 3 bifaces are symmetrical in outline, retain no cortex, and exhibit secondary thinning. Biface fragments were not categorized by stage.

Unifacially modified flakes are pieces of lithic debitage that exhibit intentional modification on one side along one or more edges, with such modification often being evidenced by micro-chipping. Tools of this type often show evidence of wear along the modified edge.

Utilized flakes are pieces of lithic debitage that exhibit use-wear on one or more edges. Patterned wear was evaluated with the goal of identifying the material(s) on which the tool was used. Utilized flakes evidence patterned wear consistent with use but lack evidence of intentional modification.

Ground and battered stone tools are generalized tools in the sense that a single tool may not be functionally specific with regard to the manner in which it is used or the things it is used to process.
or prepare. To systematically classify these tools, it is important to use well-defined criteria for recognizing their diverse nature and possible function. Since a variety of processes can produce distinctive wear, tools were assigned to analytical categories on the basis of several key variables: the mechanical processes, the outcome of those processes, and the material being processed. Microscopic examination of each tool aided in the identification of the key mechanical processes and the subsequent wear patterns still visible on the tool. Because any tool can be used in a range of activities, multifunctional tools were categorized on the basis of the predominant type of wear present.

**Historic Artifacts**

Historic artifacts were initially divided by material into seven broad categories with the exception of uncommon and significant artifacts. These categories are ceramic, glass, metal, brick, mortar, thermally altered rock, and other. Additional attributes such as material, surface treatment, decorative element, maker's mark, morphological characteristics, technological variables, form, color, size, and condition were evaluated as warranted. Sorting criteria for each artifact category are discussed below.

**Ceramics**

Ceramics were initially categorized according to ware type and then subdivided by paste attributes. Historic ware types include coarse earthenware, refined earthenware, porcelain, and stoneware. Paste attributes such as color, hardness, and porosity can be used to identify paste types within each ware type. Examples of paste types for coarse earthenware include redware and terracotta, while refined earthenware can be further distinguished as whiteware, ironstone, semiporcelain, and yellowware. During excavations, only ironstone, semiporcelain, porcelain, and stoneware paste types were encountered.

**Ware and Paste**

**Refined Earthenware:** Refined earthenware has a fine paste, delicate form, and thin vessel walls. It is relatively less porous than coarse earthenware but not porcelain or stoneware. Beginning in the first half of the eighteenth century, European potters attempted to imitate Chinese porcelain and created refined earthenware ceramic bodies. American potteries followed suite, and throughout the mid to late 1800s, various developments were made both in England and America. Common paste types of refined wares include many technological innovations with overlapping production dates.

**Ironstone:** By 1813, Mason's Ironstone China was patented in Great Britain, which exhibits a whiter, harder paste than previous refined earthenwares of that time. Ironstone was first imported to America in 1842 and soon dominated the market. Ironstone is still produced today; however, it was most popular in the last half of the nineteenth century (Stelle 2011). Ironstone is identified by a colorless to blue-tinted glaze over a white paste with hardness on the Moh's scale of 2.5 or higher.
Semiporcelain: Semiporcelain is an intermediate type between other refined earthenwares and true porcelain (Rosenberg and Kvietok 1981). This ceramic type has a harder, more-vitrified paste than that of ironstone and is considered stronger and more durable. The paste is nonporous like porcelain but does not have the same glasslike consistency. It is identified by a colorless glaze over an almost vitrified white paste. Production of semiporcelain began around 1860 and continues to the present day (Ketchum 1987).

Porcelain: Porcelain is the most highly vitrified ceramic ware type, originating in China and produced by European potters after 1800 (Stelle 2011). These specimens exhibit a glasslike paste, which has miniscule to no inclusions. Porcelain is identified by its white, nonporous paste and a colorless glaze that is indistinguishable from the ceramic body.

Stoneware: While stoneware is still produced today, it was a common utility ware in the nineteenth century and early twentieth century (Ketchum 1991). Stoneware was produced for many centuries in Asia and Europe and was manufactured in eastern North America by the late eighteenth century. The technology was available in Texas as early as 1839 as potter immigrants set up kilns and shops throughout Texas.

Stoneware has a harder, more-vitrified paste than that of earthenware. It is identified by a thick, coarse-looking paste in which a temper is sometimes visible. Stoneware is nonporous and therefore nonabsorbent. Due to the impermeability of the fabric, vessels are sometimes left unglazed and are commonly found in utilitarian forms, such as crocks, jugs, churns, and pitchers. However, it is more common that stoneware is given a surface treatment of a slip or glaze, such as Albany or Bristol.

Albany slip is composed of dark brown clay mined from the Hudson River near Albany, New York. It was used in the United States throughout the latter half of the nineteenth century, and owing to its popularity, it was highly imitated. Other commercially mined slip clays so closely resemble Albany slips that slip glazes ranging in color from brown to black are referred to as Albany-like, unless the origin of the clay is known. Albany-like slip glazes ceased in commercial production around 1940 due to the general public disapproval of dark colors for food stuffs, as it was seen as unhygienic (Greer 1981).

Bristol glaze is a smooth, white to cream-colored glaze developed in Bristol, England, from ceramic chemicals in 1880 (Greer 1981). Bristol glazes quickly supplanted other types of glazes as the clean, pale color was seen as sanitary. Until around 1915, Bristol glazes were commonly employed on the exterior of vessels with an Albany-like slip on the interior. Ferruginous and Albany-like dips at the shoulder, neck, or mouth of vessels remained popular for around another 5 years (Greer 1981). After this time, Bristol glazes were used alone on the exterior and interior and can still be seen today (Stelle 2011).

A salt glaze is produced by throwing crude salt into the kiln when the fires are at their maximum intensity. The salt instantly vaporizes and combines with the clay body to form a very thin film or
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glaze on the surface. Salt glazes are distinguished by their glassy appearance and variable texture, which resembles an orange peel. This type of glazing decreases porosity and increases durability of the vessel. The density of the glaze may differ from vessel to vessel or even within a single vessel depending on the amount of salt, position within the kiln, and exposure to the salt vapor. However, the interiors of salt-glazed vessels are not generally salt glazed or they are treated in a different manner. Although salt glazing was used as early as the fifteenth century in Europe, it did not occur until the eighteenth century in America when European potters began producing stoneware (Greer 1981). In Texas, salt-glazed vessels rarely date to after the twentieth century and usually before 1840 (Lebo 1991; Moir 1987a; Moir and Green 1988). The absence of a slip-glazed interior usually indicates manufacture before 1860 (Greer 1981).

Rhenish-like slip glazes are a variation of a traditional salt glaze. A dry wash, or engobe, was applied before salt glazing in the kiln (Greer 1981). Rhenish slip glazes originated in Germany but experienced a revival from around 1860 to 1920 in America (Maryland Archaeological Conservation Lab 2011).

Morphological Attributes (Vessel Category/Form)

Historic ceramics were also categorized by form, specifically the general shape of the original vessel, such as hollow or flat. Hollow forms include bowls, cups, storage jars, etc., and examples of flat vessels are plates, platters, etc. When vessel form could not be assigned due to incompleteness, earthenwares and porcelain were generically assigned to indeterminate tableware, and stoneware to indeterminate storageware.

Decoration

Decorative treatments to historic ceramics can vary greatly and provide important evidence for site interpretation. Therefore, multiple elements of decorations on historic ceramics were recorded. These elements include decorative technique, applied color, stylistic motif, and pattern name, when relevant. Decorative techniques to the interior and exterior of sherds were identified by the particular application method(s), such as molding, hand painting, decaling, or transfer printing. Additionally, the applied decorative color(s) was determined using the Munsell Color Range System, along with a description of the present stylistic motif. When patterns were identifiable, a pattern name and accompanying manufacturing information was noted.

Decalware: Decalware (also known as decalcomania) was first introduced in 1890. It is an overglaze application of a decal, which is typically polychrome and most often has a floral design. Decalware is still commonly produced today but declined in popularity after the 1930s (Stelle 2011).
Gilded: Gilded appliqué is a type of overglaze decoration in which gold- or silver-toned metallic leaf is adhered to the ceramic vessel. Gilded decorations generally consist of banding around an exterior or interior rim or marley and have been produced since the nineteenth century.

Transferware: Transferware is also known as transfer printing. Transfer printing is a specific underglaze decorative technique that allowed the mass production of a consistent style. Introduced in Great Britain in the late eighteenth century (Stelle 2011), the process involved applying a mixture of ink and oil to a warm, engraved copper plate onto which a strong tissue paper is placed to obtain a clear impression of the design. The paper was then applied to an unfired ceramic vessel, allowing the image to be transferred to the vessel. A later technique involved the use of a sheet of glue, known as a bat, in place of the paper. Transferware, while still in production today, was most popular from approximately 1825 to the early 1900s (Snyder 1992).

Hand-painted: Hand-painted designs on English ceramics were first manufactured in the late eighteenth century, and their popularity reached a peak by the mid-nineteenth century. A wide variety of designs, including plants, birds, animals, and insects, were painted onto the vessel before it was glazed and then fired. The most popular motif found on hand-painted ceramics is a floral design. Floral designs found on refined earthenwares during the eighteenth and nineteenth centuries can be roughly divided into three chronological categories: blue on white, early polychrome, and late polychrome. Blue on white designs are usually oriental-inspired motifs in cobalt blue called chinoiserie. Later, early polychrome designs appeared in delicately painted colors such as olive green, brown, blue, and mustard yellow. In late polychrome hand-painted designs, bolder and wider strokes are seen, sometimes accompanied by stenciling, in pinkish red, black, light blue, and other light shades.

Molded: Molded decorations are expressed in various styles and are distinguished by a relief design on ceramic bodies. Examples include flared rims, embossed and impressed designs, scalloped edges, and paneled bodies. This form of decoration has only gross temporal significance as it has been commonly employed from the 1840s until the present day.

Spongeware: Spongeware consists of a treatment of daubing a colored glaze onto the surface of a ceramic vessel prior to firing. Colors included blue, green, red, yellow, brown, black, and polychrome. This type of decoration was popular from 1830 to 1860 (Stelle 2011).

Makers' Marks: Makers' marks are deliberate labels placed on the ceramic vessel during the manufacturing process. Although these marks are often decorative, they are not purely ornamental and provide information about the producer, importer, designer, style, pattern, etc. They are typically present on the exterior base of ceramic vessels and applied by various means including transfer printing, impressing, and hand painting. Beginning in 1891, goods, including ceramics, imported to the United States were required to be marked with the country of origin as decreed by the McKinley Tariff Act. Since these marks regularly changed over time, they are useful dating tools.
and can provide definite dates from the historical record (Godden 1964). Makers' marks observed on ceramic sherds were recorded according to application technique, application color, stylistic motif, and manufacturer, when identifiable.

**Artifact Form and Condition**

Artifact form describes the completeness or incompleteness of the vessel a ceramic sherd represents. For example, rim, body, base, or handle fragments detail the retained portions. More-complete sherds were classified according to multiple portions still visible, such as rim/body/base or rim/handle/body. Lastly, the artifact condition, such as evidence of burning or crazing, was included for all ceramic sherds when observed.

**Glass**

Glass was initially sorted according to identifiable morphological attributes associated with object category and subsequent object form. Object categories include container glass, window, and lighting. The specimens were then identified by the object form, when applicable. Decorative techniques as well as maker's marks were also noted for all container and lighting glass. Color variations for each glass shard were recorded in addition to artifact form and condition.

**Morphological Attributes (Object Category/Form)**

**Container Glass:** Container glass includes all glass sherds exhibiting curvature and thickness consistent with bottle and jar forms as well as lids. When recognizable, object form was also recorded. Shardlets of unknown vessel form that retained enough curvature to determine they were not window glass, but were too fragmented to assigned to specific container types, were assigned to the unknown category.

Additional morphological attributes, such as finish type, were recorded for rims of bottle, jar, and indeterminate vessel forms. Finish refers to the top of the vessel that contains elements such as the lip and rim that allow for the closure of the container (Jones and Sullivan 1989).

**Window Glass:** Window glass is defined as flat, sheet glass exhibiting an average thickness of less than 3.2 mm. Flat glass thicker than 3.2 mm is considered specialty glass not consistent with use as window panes (Moir 1987b).

**Lighting:** All lighting glass or chimney lamp glass specimens are very thin and curved and are remnants of the outer glass lamp covering of a kerosene lantern.

**Decoration:** Decorative treatments to glass include molding, embossing, and pressing. A description of the decorative motif and/or text was recorded. In the case of identifiable patterns, a pattern name and accompanying manufacturing information was noted.
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**Molding:** Molding is a deliberate decorative element that is produced by a mold and is observed in a wide variety of applications. Examples of this include panels or beveled corners.

**Embossing:** Embossing is a type of molding that results in raised decoration. Embossing is a common method employed for presenting text on a container, such as item contents or graduation marks.

**Pressing:** Pressing is a type of molding that was originally produced as an inexpensive and efficient alternative to making an object appear as if it had been hand cut. Most often, the patterns are ornate and geometric in style. A common characteristic of pressed glass is that the pattern is repeated across the entire surface area of the vessel.

**Makers' Marks:** Makers' marks are typically located on the base of glass containers and provide production information such as manufacturer, plant, year, or mold number. Marks can be made in a variety of manners, but are most commonly embossed. Like ceramic makers' marks, glass marks regularly changed over time and are useful dating tools. Makers' marks observed on glass shards were recorded according to technique, stylistic motif, and manufacturer, when identifiable.

**Technological Attributes**

Technological attributes are glass features indicative of manufacturing processes. Glass container features, such as mold seams, bubbles, suction scars, valve marks, and finishing marks, were recorded when present for every glass shard. These features indicate three generalized production methods for glass containers that evolved during the nineteenth and early twentieth centuries including hand-made, semimachine-made, and machine-made processes. For centuries, containers, such as bottles, were made by glass blowers by hand using blow pipes and pontil rods. After around 1830, molds were introduced to the free-blowing process, which created uniformity of shape. Later, with the innovation of semiautomatic machines, bottles were produced by a mold within a glass-blowing mechanism. Bottles produced prior to full automation required a final step known as “finishing,” in which the neck and lip of a bottle were produced. However, bottle finishing was no longer required with the advent of the Owens Automatic Bottle Machine in 1904, although machine-made bottles did not become common until around 1915 (Society for Historical Archaeology [SHA] 2011).

**Mold Seams:** Mold seams are raised lines on the body, shoulder, neck, finish, and/or base of the bottle that are formed where the edges of different mold sections meet (SHA 2011). Seams indicate manufacture within a mold form and are conclusive evidence that a bottle was not free-blown. Mold seams prior to the automatic bottle machine do not extend beyond the neck of the bottle to the rim. Therefore, mold seams provide broad temporal indications that a glass container was manufactured after 1830, and when present on neck/rim fragments, they can date a container to after 1904.
4. Methods

**Bubbles:** Bubbles are variably sized gas or air pockets in glass. By the twentieth century, the introduction of arsenic or sodium nitrate into the glass production process eliminated impurities such as bubbles (Kendrick 1963). Therefore, glass containing bubble inclusions usually has a production date prior to 1920 (Polak 2000).

**Suction Scars and Valve Marks:** A suction scar is a diagnostic mark on the base of a container produced by the Owens Automatic Bottle Machine. Suction scars are identified by their more or less circular appearance with a very fine “splotchy” line that is either incised into or raised above the glass surface. Often, suction scars are off-center and may overlap onto the heel of a bottle. Suction scars present on glass container bases indicate manufacture after 1904 and most likely after 1910 until around 1947 (SHA 2011).

A valve mark is a circular scar on the base of a glass container produced by several automatic bottle machines of the press-and-blow variety. Valve marks are recognized by their smooth, round appearance, usually centered on the base, and generally measure 10 to 14 mm in diameter. Valve marks are most often found on glass containers made from the late 1910s into the 1940s (SHA 2011).

**Finishing:** Finishing is the last step in producing a mouth-blown bottle and requires the “finishing” of the bottle rim where the blowpipe was removed. Varying techniques have been employed, including hand-tooled and applied finishes. Tooling is the process of applying a lipping tool to the rim of a vessel in order to produce the desired finish, which often produces obliteration of mold seams near the rim and the “swirling” of the glass at the point of contact. Applied finishes involve an extra application of glass to the rim in order to form the finish, and also employ the use of a lipping tool in order to produce the desired rim form. Glass container rims exhibiting tooled and applied finishes generally predate 1915 when fully machine-made bottles dominated commercial production (SHA 2011).

**Color**

Color is an important descriptive element; however, it provides limited temporal data due to significantly broad popularity and production date ranges (Jones and Sullivan 1989). Coloring in glass is produced naturally by iron oxides found in sand used in glass composition, as well as artificially by neutralizing natural variations then adding chemical compounds to achieve the desired color. As glass-making chemistry and techniques were refined during the 1920s, glass colors became more consistent and uniform throughout commercial industry. Glass colors have no standard terminology; however, every glass shard’s color was recorded using nomenclature proposed by the SHA (2011). Modifying terminology, such as light or dark, was also employed to more precisely describe the color intensity or hue.

**Amber:** Various shades of amber in container glass have been very common from the nineteenth century to the present day. Amber colors are produced from natural impurities, such as iron and
manganese, as well as from artificial additives like nickel, sulfur, and carbon. Typical amber (also known as “beer bottle brown”) is the most common amber shade and likely dates to the twentieth century. Variations of amber, such as dark amber or light yellow amber, most likely date to before the 1920s when glass colors were standardized (SHA 2011).

**Aquamarine:** Aquamarine results from low levels of natural iron impurities in the sand, which were not offset with color-neutralizing agents during the glass-making process. Aquamarine was a very popular color in all types of jar and bottle glass from the early nineteenth century to the 1920s and remained well liked in canning jars into the 1930s. Around this time, consumer preference for colorless glass caused production of aquamarine vessel glass to wane. However, shades of aquamarine in soda bottle form are still widely produced today (SHA 2011).

**Colorless:** Colorless glass lacks color; however, it is not always absolutely colorless. Faintly visible tints of pink, amber, aquamarine, green, or gray may be visible within the thickest part of the glass. Glass with an absence of color was a goal of glass makers for centuries, but it was not until the late nineteenth and early twentieth centuries, as chemistry and glass-making technology improved, that more-effective and inexpensive methods were produced. Colorless glass was thus created by utilizing sand deposits with the lowest possible iron content, then adding decoloring agents to neutralize any iron impurities in the glass (SHA 2011).

**Solarized Glass:** Colorless glass also consists of a subcategory of solarized glass including sun-colored amethyst and straw-colored yellow. Solarized glass is the result of adding ultraviolet sensitive decoloring agents to a glass mixture. Manganese dioxide, selenium dioxide, and arsenious oxide were commonly used as color neutralizers. However, prolonged exposure to ultraviolet rays, such as sunlight, causes a chemical reaction that tints the once colorless glass. Additions of manganese dioxide produce a distinct amethyst color, while additions of selenium and/or arsenic produce a subtle yellow tint or “straw color.” Although manganese has been used for centuries for its decolorizing properties in glass making, it was most commonly used from 1890 to 1920. Selenium and arsenic, or combinations of both, were not commonly seen until after the mid-1910s and continued into the 1950s (SHA 2011).

**Olive:** Olive-colored glass can be made through numerous natural or artificial processes of glass making, coloring agents, and sand impurities, i.e., iron dioxide. As a result, a myriad of olive hues are present in many different container forms. Olive glass in general was more common in the 1800s than the 1900s with the exception of some liquor, champagne, and wine bottles, while olive-amber and some other tones have more-specific dating utility (SHA 2011).

**Opaline:** Opaline, or milk glass, is an opaque white glass produced by adding tin or zinc oxides, fluorides, and phosphates to the glass mixture. Opaline glass was used in the production of a wide array of different vessel types, though the color was most commonly used in hygienic bottles and jars from the 1870s to the 1950s (SHA 2011).
4. Methods

Artifact Form and Condition

Artifact form describes the completeness or incompleteness of the vessel a glass shard represents. For example, rim, body, neck, or base fragments detail the retained portions. More-complete shards were classified according to the multiple portions still visible, such as rim/neck/body. Lastly, the artifact condition, such as evidence of burning, was included for all glass shards when observed.

Metal

Metal specimens were initially categorized according to specific metal type, such as copper, ferrous metal, or lead. Morphological attributes were identified, which permitted classification into object category and subsequent object form. Technological variables were also noted for temporally sensitive object forms. In addition, makers' marks were recorded when present, along with artifact form and condition. Size was recorded for particular artifact forms.

Object Function

Metal objects were also categorized by function as ammunition, hardware, utensil, fastener, tool, writing implement, toy, husbandry, container, and unknown. Some metal specimens were subcategorized. For example, hardware includes nails, fence staples, screws, wire, barbed wire, and washers.

Technological Attributes

Temporally sensitive technological attributes were recorded, when present, for metal artifacts such as cartridge cases and nails.

Cartridge Cases: Cartridges are self-contained packages enclosing the bullet, gunpowder, and primer into a single metallic case. Recorded attributes include rimfire or centerfire mechanisms. The former is fired by a primer located in the rim of the base, and the latter by a primer located in the center of the base. Rimfire cases with gunpowder were first developed for Smith and Wesson in 1857 in the .22 caliber, short form. Rimfire cases were manufactured from copper and later brass tubes. A die was used to mold and fold the tube to contain a hollow rim at the closed end. With the introduction of centerfire cartridges in 1868 by the Union Metallic Cartridge Company, these cases were adapted to hold a primer in the center of the base. This type of centerfire cartridge is known as a folded, balloon-head case. Improvements were made to the centerfire cartridge after 1870, which culminated with the introduction of the modern solid-head centerfire cartridge (Barnes 1969).

Nails: Nails were historically produced using three basic methods: wrought, cut, and wire. Wrought nails are the earliest known nail form, and have been made since the ancient Roman era. They were forged by a blacksmith and exhibit a tapering shaft on all sides with varying head shapes. Handmade nail production continued until the end of the eighteenth century. Although cut nails have
been produced in America since the 1790s, they did not supplant wrought nails in the construction industry until around 1815. Cut nails are made mechanically by “cutting” a blank off the end of an iron or steel plate, which is then headed by hand or machine. As a result, the shaft of the nail is quadrilateral in cross section. Cut nails can be further classified according to the directions in which the iron blanks were cut. Cutting on the same side of the blank occurred from the 1790s into the early nineteenth century. Cutting from opposite sides of the blank was introduced in 1810, however, nails were still commonly cut from the same sides until the 1830s (Nelson 1968). Although cut nails are still manufactured today, wire nails began replacing cut nails in 1890. Wire nails are machine made from drawn wire and the shafts display a round cross section. Wire nails did not become ubiquitously available and in common use until sometime after 1900 (Edwards and Wells 1993).

**Makers' Marks**

Makers’ marks are typically present on ammunition such as cartridge cases and are commonly known as headstamps. These makers’ marks are located on the head of the metallic cartridges and provide production information, such as manufacturer, branding, and size. Headstamps observed on cartridge cases were recorded according to manufacturer, text, and motif, when discernible.

**Size**

Size was recorded for ammunition. Lead shot is a collective term defined as spherical, sub-bore-sized munitions intended to be fired in a charge of multiple projectiles. Sizes of lead shot vary; however, as a guide, shot is termed either birdshot or buckshot, depending on the diameter.

**Artifact Form and Condition**

Artifact form refers to the completeness of a specimen. Metal artifacts were either complete or fragmentary. Cartridge cases were categorized as either spent or complete. Lastly, the artifact condition, such as evidence of oxidation or rust, was noted.

**Brick and Mortar**

Brick specimens were initially categorized by production methods. Makers’ marks were noted when present along with accompanying manufacturing information. Color, form, condition, surface treatment, and mass were recorded for all brick specimens. For complete specimens, dimensions were documented. Mortar specimens were classified according to color, form, condition, surface treatment, and mass.
Other

The Other category includes specimens that are of uncommon material, such as plastic, or of a significant form, such as a button. Individual specimens were analyzed according to differing criteria based on their classification.

Plastic

Plastic specimens were examined for material traits distinctive of early or modern plastics. Specimens lacking diagnostic traits were categorized as unknown plastic. Munsell color, artifact form, and artifact condition were also recorded.

Button

Buttons were initially sorted by material type, attachment, and shape. Decorative characteristics were also noted for decorated buttons. In addition, makers’ marks were recorded when present, along with artifact color, form, size, and condition.

Other Artifacts

Thermally altered rocks and burned clay were not categorized either as historic or prehistoric artifacts as they conceivably could represent either.

Thermally Altered Rock

Thermally altered rock is defined as rock exhibiting signs of heating, which includes color change, increased luster, and fracturing. Thermally altered rocks are not temporally diagnostic and could have resulted from both prehistoric and historic processes. However, thermally altered rocks occurring on a historic site in conjunction with historic artifacts presumably represent historic occupation. During analysis, thermally altered rocks were analyzed according to material type, degree of alteration, and weight in metric units.

Material Type: All thermally altered rock specimens were initially identified by raw material type. Raw material types encountered during excavation include hematitic sandstone and quartz arenite. Hematitic sandstone is a quartz arenite composed of greater than 95 percent silica dioxide (SiO$_2$) with a matrix comprised primarily of hematite. Hematite has the chemical formula Fe$_2$O$_3$ (ferric oxide) and is produced by the weathering of ferromagnesian minerals. Hematite is a very stable mineral and as a result can be found in abundance in arid and humid environments. The color of the specimen includes shades of reddish brown, leaves a reddish brown streak, has a hardness ranging between 4 and 7, and has a metallic luster (Nesse 2000). Quartz arenite is composed of approximately 99 percent SiO$_2$ formed by the deposition of silica through solution, creating a homogenous mass. Unlike metaquartzite, the quartz grains of quartz arenite have not endured metamorphic deformation and are simply interlocked by a matrix of quartz (or carbonate) cement.
4. Methods

The mineral has a hardness of 7, a colorless streak, a waxy luster, and tends to fracture across the grain in a subconchoidal or conchoidal manner with respect to grain size. The color of a specimen is typically pale gray to pale brown or white. In a thin section, the quartz grains will appear subhedral or well rounded, while the cement matrix will exhibit the optical properties of quartz (Nesse 2000).

**Degree of Alteration:** All of the thermally altered rocks were categorized as burned rocks or fire-cracked rocks. Burned rock specimens exhibit increased luster and/or color change associated with heat alteration, which predominantly includes hues of red, on all or part of the specimen. However, these specimens do not exhibit heat fracturing. Fire-cracked rock specimens exhibit all three forms of heat alteration including color change, increased luster, and heat fracturing. Heat fracturing is the key identifier for fire-cracked rocks, which results from exposure to high temperatures for extended periods of time.

**Burned Clay**

Burned clay is soil that exhibits evidence of thermal alteration. It can be composed of varying types of clay including sandy clay, silty clay, etc. Burned clay is identified by the darkening of color and increased hardness. Specimens were evaluated based upon grain size, Munsell color, and mass.
NRHP TESTING OF PREHISTORIC SITE 41LT56

BACKGROUND

Site 41LT56 is a prehistoric site originally recorded by Prewitt and Grombacher (1974). The site was revisited and evaluated by PBS&J in 2007 (Sherman and Watkins 2007). It is located on a north-south-trending ridge above Steele Creek. The site's elevation ranges from 375 feet (ft) above mean sea level (msl) to 387 ft msl. The main channel of Steele Creek flows approximately 300 m west of the site at its closest point. The soil on the northern half of the site is Silawa fine sandy loam, 5 to 12 percent slopes, while the soil on the southern half of the site is Gasil loamy fine sand, 1 to 5 percent slopes (Griffin 1997). Shovel testing during the site revisit (Sherman and Watkins 2007) revealed a dark brown to yellowish brown loamy sand that extended in depth between 10 cm and more than 1 m above a strong brown to yellowish brown clay. The site extends roughly 583 m north-south by 116 m east-west and covers an area of approximately 67,628 m² (Figure 3).

The site is primarily in pasture and vegetated with dense grasses and scattered patches of prickly pear and dewberry vines. Several small stands of oak and elm with a briar and yaupon understory are also present. On the west, the site extends into a mixed pine and hardwood forest. Ground surface visibility was nonexistent due to the dense vegetation.

PREVIOUS RESEARCH

The site was originally recorded based on surface expression as a lithic artifact scatter that extended 175 x 60 m. Artifacts observed on the ground surface included debitage and burned rocks. At that time, the site was judged to be in good condition, although no subsurface investigation was conducted (Prewitt and Grombacher 1974).

During the revisit (Sherman and Watkins 2007), a total of 156 shovel tests were excavated to determine the horizontal and vertical extent of the site. Of these shovel tests, 40 were culturally positive, yielding 101 artifacts consisting of 93 pieces of nondiagnostic lithic debitage, 5 utilized flakes, 2 lithic bifaces, and 1 Steiner arrow point. Three fragments of charcoal (totaling 0.8 gram [g]) and 10 fragments of fire-cracked rock (totaling 36.52 g) were also recovered. This work demonstrated that the site extends, intermittently, for nearly 600 m along the ridge it occupies.
WORK ACCOMPLISHED

Positional Control

A control grid was established on-site using a total station. Pin flags were placed at 20-m grid intercepts. In the wooded portion of the site, a hand-held compass and a 30-m tape were used to extend the control grid. The positions of shovel tests excavated within the wooded portion of the site were acquired with a Trimble Geo XT GPS device. The positions of all other shovel tests, hand-excavated units, and mechanical trenches were acquired with the Trimble and shot in the total station.

Shovel Testing

Shovel testing was undertaken in two phases. During the first phase, 182 shovel tests were excavated at 20-m grid intercepts across the site, of which 70 were culturally positive, yielding 128 pieces of lithic debitage, 2 unifacially modified flakes, 2 utilized flakes, 2 bifaces, 1 dart point, 3.19 g of charcoal, 677.97 g of fire-cracked rocks, 2 prehistoric ceramic sherds, 2 faunal bone fragments, 5 fragments of burned soil, and 3 glass shards.

Lithic debitage and fire-cracked rocks were the most common classes of cultural material recovered from the first phase of shovel testing. Debitage was recovered from 64 shovel tests, with a recovery rate ranging between 1 and 8 specimens. An average of two pieces of lithic debitage was recovered from each shovel test positive for this material class, with a standard deviation of 1.825. Ten shovel tests had debitage recovery rates more than one standard deviation above the mean. Eight of these debitage high density shovel tests were located in the central portion of the site in an area extending roughly 165 m north-south by 130 m east-west that is considered to be a debitage high density area and is henceforth referred to as Area 1 (see Figure 3). One of the remaining debitage high density shovel tests was located in the northwest corner of the site, while the other was located in the southeast corner of the site. The vicinity of each of these last two debitage high density shovel tests, consisting of the area that includes adjacent positive shovel tests, are respectively referred to as areas 2 and 3. Area 2 extends roughly 60 m north-south by 20 m east-west. Area 3 can be contained within a roughly 90-m-diameter area.

Between 1.25 and 273.44 g of fire-cracked rocks was recovered from the eight shovel tests positive for this class of material, with an average of 84.74 and a standard deviation of 95.53. Only one shovel test, located within Area 1, had a fire-cracked rock recovery rate more than one standard deviation above the mean.

Seven shovel tests excavated during the first phase of shovel testing yielded lithic tools. Six of these shovel tests were located within Area 1. Charcoal was recovered from five shovel tests in amounts ranging from 0.06 g to 1.86 g. The shovel test that yielded the highest concentration of charcoal was located within the western half of Area 1.
During the second phase of shovel testing, an additional 118 shovel tests were excavated at 10-m grid intercepts around positive shovel tests excavated in the vicinity of areas 1, 2, and 3. A total of 93 shovel tests excavated during the second phase of shovel testing were culturally positive, yielding 206 pieces of lithic debitage, 14 utilized flakes, 2 dart points, 2 ground stone fragments, 2 prehistoric ceramic sherds, 1,458.61 g of fire-cracked rocks, 25.48 g of charcoal, and 6 faunal bone fragments.

Lithic debitage and fire-cracked rocks were the most common classes of material recovered during the second phase of shovel testing. A total of 80 shovel tests excavated during this phase yielded lithic debitage with recovery rates ranging between 1 and 11 specimens, with an average of 2.03 and a standard deviation of 1.7458. A total of 15 shovel tests had lithic debitage recovery rates more than one standard deviation above the mean and are considered lithic high density shovel tests. Of these 15 shovel tests, 13 were located within Area 1 and two were located in the vicinity of Area 3.

Fire-cracked rocks were recovered from 42 shovel tests excavated during the second phase of shovel testing. The fire-cracked rock recovery rate ranged between 0.33 and 143.53 g for each shovel test positive for this class of material, with an average of 13.382 and a standard deviation of 27.3159. A total of 15 shovel tests had fire-cracked rock recovery rates more than one standard deviation above the mean. Twelve of these shovel tests were excavated within Area 1. The remaining three shovel tests that yielded high densities of fire-cracked rocks were located within Area 3.

The second phase of shovel testing yielded a total of 18 lithic tools, recovered from 15 shovel tests. The bulk of these items were recovered from Area 1. One lithic tool was, however, recovered from both areas 2 and 3. The distribution of artifacts recovered from both phases of shovel testing is shown on Figure 4.

**Horizontal Distribution of Cultural Materials**

Shovel testing during both phases revealed the presence of three spatially isolable subsite areas (see Figure 4). The boundaries of the subsite areas were drawn to include debitage and fire-cracked rock high density shovel tests and all adjacent contiguous positive shovel tests. Area 1 is the largest subsite area and was defined by 105 positive shovel tests and comprises roughly 15,592 m². Area 2 is the smallest and was defined by only 5 positive shovel tests and comprises roughly 840 m². Area 3 was defined by 33 positive shovel tests and comprises about 6,362 m².

Area 1 was not only the largest subsite area, but also had the highest artifact density and diversity. The artifacts recovered from each of the subsite areas are listed in Table 3. All 10 of the basic artifact categories shown in Table 3 were represented in Area 1, while only four were represented in Area 2 and seven were represented in Area 3. The density of cultural material (in artifacts/m²) of
Figure 4

SITE 41LT56

ARTIFACT DENSITY CLINES

- Positive Shovel Test
- Negative Shovel Test
the two most common material classes, lithic debitage and fire-cracked rock, also vary notably. Table 4 compares the density of these materials by subsite area.

### Table 3: Site 41LT56 Subsite Area Artifact Assemblage Summary

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biface</td>
<td>1</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Charcoal</td>
<td>14.42 (g)</td>
<td>0.36 (g)</td>
<td>13.89 (g)</td>
</tr>
<tr>
<td>Ceramic</td>
<td>2</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Dart Point</td>
<td>2</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Debitage</td>
<td>250</td>
<td>5</td>
<td>54</td>
</tr>
<tr>
<td>Faunal fragment</td>
<td>7</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>Ground stone</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Thermally Altered Rock</td>
<td>1,730.2 (g)</td>
<td>–</td>
<td>406.38 (g)</td>
</tr>
<tr>
<td>Unifacially Modified Flake</td>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Utilized Flake</td>
<td>14</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 4: Site 41LT56 Debitage and Fire-cracked Rock Density by Subsite Area

<table>
<thead>
<tr>
<th></th>
<th>Area 1</th>
<th>Area 2</th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debitage</td>
<td>0.016033</td>
<td>0.005952</td>
<td>0.008488</td>
</tr>
<tr>
<td>Fire-cracked Rock</td>
<td>0.110964</td>
<td>–</td>
<td>0.063879</td>
</tr>
</tbody>
</table>

Area 1 yielded 0.016033 pieces of lithic debitage and 0.110964 g of fire-cracked rocks for each square meter. Lithic debitage in Area 1 was nearly three times as dense as it was in Area 2 and nearly twice as dense as it was in Area 3. No fire-cracked rocks were recovered from Area 2. Fire-cracked rocks were almost two times as dense in Area 1 as in Area 3.

The presence of fire-cracked rocks in areas 1 and 3 suggests both areas resulted in part from processing subsistence resources. The fact that both classes of material were nearly twice as dense in Area 1 as in Area 3 suggests the former area was utilized far more intensively. Area 2 lacked fire-cracked rocks and had the lowest concentration of lithic debitage of the three subsite areas. These observations suggest Area 2 was the least intensively utilized subsite area during the prehistoric period.

Morphological variation in the nontool lithic assemblages from the subsite areas is consistent with the above interpretations. Areas 1 and 3 had similar ratios of broken flakes to complete flakes to debris and to flake fragments, suggesting that the reduction strategies that resulted in these assemblages did not vary. The nontool assemblage from Area 2 includes only five artifacts. For this reason, any interpretations concerning the reduction strategies it represents are subject to sample-size error. Table 5 compares the debitage morphology by subsite area.
Table 5: Site 41LT56 Debitage Morphology Ratio by Subsite Area

<table>
<thead>
<tr>
<th></th>
<th>Area 1</th>
<th></th>
<th>Area 2</th>
<th></th>
<th>Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
</tr>
<tr>
<td>Broken Flake</td>
<td>86</td>
<td>34.4</td>
<td>1</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>Complete flake</td>
<td>80</td>
<td>32</td>
<td>1</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Debris</td>
<td>40</td>
<td>16</td>
<td>1</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Flake Fragment</td>
<td>44</td>
<td>17.6</td>
<td>2</td>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>Totals</td>
<td>250</td>
<td>100</td>
<td>5</td>
<td>100</td>
<td>54</td>
</tr>
</tbody>
</table>

**Vertical Distribution of Cultural Materials**

Debitage and fire-cracked rock were the most common classes of cultural material recovered onsite. For this reason, the patterned vertical distribution of these materials is more likely to reflect the site's formation history than other classes of recovered cultural materials. Fire-cracked rocks were unevenly distributed throughout the vertical column in areas 1 and 3 (Table 6). In Area 1, fire-cracked rocks were recovered in the greatest frequency from Level 8, from where just over 40 percent of the Area 1 fire-cracked rock assemblage was recovered. In Area 3 fire-cracked rocks were concentrated in Level 6, from where just over 30 percent of the Area 3 fire-cracked rock assemblage was recovered.

Table 6: Site 41LT56 Vertical Distribution of Fire-cracked Rock by Subsite Area

<table>
<thead>
<tr>
<th>Level</th>
<th>Area 1</th>
<th></th>
<th>Area 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>1</td>
<td>1.28</td>
<td>0.07</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>128.77</td>
<td>7.44</td>
<td>1.06</td>
<td>0.26</td>
</tr>
<tr>
<td>3</td>
<td>75.41</td>
<td>4.36</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>144.7</td>
<td>8.36</td>
<td>41.91</td>
<td>10.31</td>
</tr>
<tr>
<td>5</td>
<td>65.94</td>
<td>3.81</td>
<td>35.11</td>
<td>8.64</td>
</tr>
<tr>
<td>6</td>
<td>91.24</td>
<td>5.27</td>
<td>124.38</td>
<td>30.61</td>
</tr>
<tr>
<td>7</td>
<td>86.07</td>
<td>4.97</td>
<td>25.08</td>
<td>6.17</td>
</tr>
<tr>
<td>8</td>
<td>705.88</td>
<td>40.80</td>
<td>80.49</td>
<td>19.81</td>
</tr>
<tr>
<td>9</td>
<td>92.72</td>
<td>5.36</td>
<td>60.44</td>
<td>14.87</td>
</tr>
<tr>
<td>10</td>
<td>255.27</td>
<td>14.75</td>
<td>37.91</td>
<td>9.33</td>
</tr>
<tr>
<td>11</td>
<td>44.63</td>
<td>2.58</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>12</td>
<td>38.29</td>
<td>2.21</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

Above and below the 10-cm level where fire-cracked rocks were concentrated, in both areas 1 and 3, this material was more or less evenly distributed. This pattern is thought to have resulted from a combination of postdepositional artifact cycling attributable to floral and faunal turbation, and potentially aggradation of the landform harboring the site from colluvial deposition. Larger
materials, such as fire-cracked rocks, are more subject to down-migration than up, as burrowing rodents tend to tunnel below larger obstacles rather than remove them (see Bocek 1986). It is also possible that the deeply buried concentrations of fire-cracked rocks represent subsistence processing features built in pits. The observation, however, that 16 shovel tests excavated across Area 1 yielded fire-cracked rocks from Level 8 suggests that recovery from there was not limited only to immediate feature contexts. Plausibly, the fire-cracked rocks recovered from the two highest-yielding shovel tests 92 and 112 were recovered from feature contexts.

Compared to fire-cracked rocks, lithic debitage was far more evenly distributed throughout the vertical column in areas 1 and 3 (Table 7). In these areas, debitage was recovered in the lowest frequencies at the top and the bottom of the vertical column and remained fairly stable in the intervening levels. This pattern presumably can be attributable, in part, to both floral and faunal sources of turbation, which can result in vertical artifact cycling. Debitage was unevenly distributed throughout the vertical column in Area 2.

Three subsite areas were defined based on the results of both phases of shovel testing. Interassemblage variation between the subsite areas suggests their formation histories also varied. Area 1 was the largest subsite area, and its artifact assemblage demonstrated the highest density and diversity of the subsite areas. Consequently, it is thought to have resulted from the highest level of occupational intensity and represents longer and more-frequent occupational episodes during which a greater number of tasks were conducted than the other site areas.
Area 2 was the smallest of the subsite areas, and its artifact assemblage had the lowest density and diversity. Area 2 is thought to have resulted from a short-duration occupation for a limited set of activities. The absence of fire-cracked rocks in the Area 2 shovel testing assemblage suggests subsistence resources were not processed within Area 2.

Area 3 was somewhat smaller in areal extent than Area 1 with a somewhat less diverse and lower density artifact assemblage. Area 3 is thought to have arisen through similar processes as Area 1 though through somewhat lower occupational intensity.

**Magnetometer Survey**

Recent magnetometer surveys conducted by PBS&J in the post oak savannah at sites 41LT253, 41LT347, and 41LT320 (Sherman et al. 2007) and in northeast Texas at site 41RK468 (Dixon et al. 2008) proved successful at locating prehistoric burned rock features. The anomalies associated with single burned rock features at these sites have a range in declination from 40 degrees west to 32.5 degrees east, a maximum distance between poles of 2.4 m, and a positive peak stronger than its negative peak (a positive to negative nT ratio greater than 1).

The magnetometer survey at 41LT56 was conducted within two metric control grids, one to the north and one to the south. These locations were selected for magnetometer survey based on the results of the shovel testing. The northern grid (Area 1) extended 100 m by 100 m (Figure 5), and the southern grid (Area 3) extended 60 m by 60 m (Figure 6). The magnetometer survey at 41LT56 located 40 discrete dipolar anomalies that had a declination close to north and had the potential to be associated with cultural features. Twenty-five of these anomalies were sampled with backhoe trenches (Table 8). Eleven of the anomalies sampled with a backhoe trench were found to be associated with a feature. Three additional features (see Mechanical Excavation below) were identified during trenching and hand excavation that were not associated with a magnetic anomaly.

The geophysical investigations at site 41LT56 were undertaken with the goal of assisting in the location of buried prehistoric burned rock features. Intact burned rock features are generally associated with dipolar magnetic anomalies with a declination close to magnetic north (with the negative pole to the north) due to the fact that during the heating process, the magnetic elements of each of the rocks within the features become aligned with magnetic north. The features are usually located at the inflection point between the positive and negative poles. When burned rock features become disturbed and disarticulated, the declination of the anomaly shifts and the anomaly amplitude weakens.
Figure 5
Site 41LT56
Area 1
Magnetometer Survey Results

Positive 5 nT
Positive 1 nT
Negative 1 nT
Negative 5 nT

5 nT Contours

Shaded Relief

Grayscale

Site Boundary
Backhoe Trench
Hand-excavated Unit

Magnetic Anomaly

0 60 120 Feet

0 15 30 Meters

Prepared By: PBS&J/19895
File: C:\Commercial\Site 41LT56\geo\figs\41LT56_magn.mx.png

Job No: 100016087
Date: March 10, 2011
Scale: 1" = 15m
Figure 6
Site 41LT56
Area 3
Magnetometer Survey Results

Prepared By: 19695
Job No: 100016087
Date: March 11, 2011

Positive 5 nT
Positive 1 nT
Negative 1 nT
Negative 5 nT

5 nT Contours
Shaded Relief
Grayscale

Site Boundary
- Site Boundary
- Backhoe Trench
- Hand-excavated Unit
- Magnetic Anomaly

Scale: 1" = 25 m
File: N:\Clients\K_Lumnant\Kosse\100016087\figs\41LT56_mag3.mxd
Table 8: 41LT56, Magnetometer Anomalies Investigated by Backhoe Trenching

<table>
<thead>
<tr>
<th>Anomaly Number</th>
<th>Amplitude (nT)</th>
<th>Distance between Poles</th>
<th>Declination</th>
<th>Trench Number</th>
<th>Feature Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>−32/85</td>
<td>1.0</td>
<td>3.7° west</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>−23/53</td>
<td>1.0</td>
<td>3.3° west</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>−13/25</td>
<td>1.1</td>
<td>18.3° east</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>−34/49</td>
<td>2.1</td>
<td>21.4° west</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>−15/9</td>
<td>0.9</td>
<td>20.2° east</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>−18/40</td>
<td>1.0</td>
<td>11.1° east</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>−20/31</td>
<td>0.5</td>
<td>5.6° east</td>
<td>7–8</td>
<td></td>
</tr>
<tr>
<td>8</td>
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<td>7–8</td>
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</tr>
<tr>
<td>10</td>
<td>−13/13</td>
<td>1.1</td>
<td>16.3° west</td>
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<tr>
<td>11</td>
<td>−8/18</td>
<td>1.0</td>
<td>7.3° east</td>
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<td></td>
</tr>
<tr>
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<td>−15/28</td>
<td>1.1</td>
<td>9.5° west</td>
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<td></td>
</tr>
<tr>
<td>13</td>
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<td>14.3° west</td>
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<tr>
<td>21</td>
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<td>1.0</td>
<td>7.7° east</td>
<td>21</td>
<td>15, 16</td>
</tr>
<tr>
<td>23</td>
<td>−10/33</td>
<td>1.2</td>
<td>29.1° east</td>
<td>23</td>
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</tr>
<tr>
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<td>−60/70</td>
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<td>22.1° east</td>
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<td>17</td>
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<tr>
<td>27</td>
<td>−8/20</td>
<td>1.2</td>
<td>26.9° east</td>
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<tr>
<td>29</td>
<td>−25/85</td>
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<td>30° west</td>
<td>29</td>
<td>10</td>
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<td>−21/79</td>
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<td>5.7° west</td>
<td>30</td>
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<tr>
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<td>7.6° west</td>
<td>33</td>
<td>11, 12</td>
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<tr>
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<td>−33/53</td>
<td>1.3</td>
<td>21.5° west</td>
<td>34</td>
<td>19</td>
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<tr>
<td>39</td>
<td>−19/29</td>
<td>1.9</td>
<td>30.4° east</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>−6/13</td>
<td>1.5</td>
<td>0°</td>
<td>3</td>
<td>6</td>
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</tbody>
</table>

**Mechanical Excavation**

Twenty-four backhoe trenches were mechanically excavated at 41LT56. In general, trench numbers corresponded to the anomaly number sampled. However, Anomaly 32 was sampled with Trench 33 and Anomaly 40 was sampled with Trench 3. Anomalies 7 and 8 were sampled with the same trench (trenches 7 and 8).

Fifteen trenches were excavated in Area 1, and 9 trenches were excavated in Area 3. Trenching was halted once features were found or when trench depths reached 130 centimeters below the surface (cmbs). Figures 7 and 8 show trench and feature locations. Profile drawings of each trench are
Figure 7
Site 41LT56
Area 1 Detail

Prepared by: [Name]

Scale: 1/10,000

Job No.: 10016077

Date: March 16, 2011

File: M:\Clients\CUM\Excavate\2011\10016077\Figure_7_Area_1_Detail.dwg
Figure 8
Site 41LT56
Area 3 Detail

Prepared By: PBS&J/19895
Job No.: 100016087
Scale: 1" = 15m
Date: March 8, 2011

Site Boundary
Area 3
Backhoe Trench
Hand-excavated Unit
Magnetometer Survey Area
2ft Topographic Contour
Positive Shovel Test
Negative Shovel Test
Magnetic Anomaly
Feature

File: N:\Clients\K\L\Luminant\Kosse\100016087\geo\figs\41LT56_Area3.mxd
included in Appendix A. Sixteen features were identified as the result of trenching. Eight of the 16 features were further sampled with hand excavation.

**Trench 1**

Trench 1 was excavated near the southwest corner of Area 3 to sample Anomaly 1. It was oriented east to west and was approximately 10 m in length by 1 m in width. It was excavated to an average depth of 120 cmbs (see Appendix A, Figure A-1). Trench 1 did not expose any cultural features.

**Trench 2**

Trench 2 was excavated 5 m northeast of Trench 1 in the southwest corner of Area 3 to sample Anomaly 2. It was oriented east to west, extending 10 m in length by 1 m in width. It was excavated to an average depth of 110 cmbs (see Appendix A, Figure A-2). No cultural features were observed during excavation; however, 751.06 g of fire-cracked rocks was collected from the backdirt pile, suggesting a small feature was present but removed during trenching. Additionally, 1 piece of lithic debitage and 1 ground stone mano were recovered from the Trench 2 backdirt.

**Trench 3**

Trench 3 was excavated 5 m east of Trench 1 to sample Anomaly 3. It extended approximately 10 m in length by 1 m in width and was oriented east to west. Trench 3 was excavated to an average depth of 115 cmbs (see Appendix A, Figure A-3) and exposed two burned rock features, features 6 and 7. An additional 2,684.85 g of fire-cracked rocks and 1 mano fragment were recovered from the Trench 3 backdirt. Feature 6 was associated with Anomaly 40 but was not sampled further because of its small size. Feature 6 was a small cluster of fire-cracked rocks, likely a disarticulated hearth, which extended approximately 35 cm north to south by 20 cm east to west at a depth of 35 cmbs (Figure 9). A larger feature, Feature 7, was found east of Feature 6 and was sampled with the hand excavation of Unit 8.

**Trench 4**

Trench 4 was excavated 6 m northeast of Trench 3 to sample Anomaly 4. It extended approximately 6 m in length by 1 m in width. Trench 4 was oriented east to west and was excavated to an average depth of 100 cmbs (see Appendix A, Figure A-4). One burned rock feature, Feature 8, was identified in the west end of Trench 4. Feature 8 was sampled with the hand excavation of Unit 6. An additional 493.89 g of fire-cracked rocks was collected from the Trench 4 backdirt.

**Trench 5**

Trench 5 was excavated near the center of Area 3, approximately 20 m north of Trench 2, to sample Anomaly 5. Trench 5 was approximately 7 m in length by 1 m in width, oriented east to west, and excavated to an average depth of 90 cmbs (see Appendix A, Figure A-5). The trench exposed one
burned rock feature, Feature 5. Feature 5 was sampled with the hand excavation of Unit 7. An additional 58.65 g of fire-cracked rocks was collected from the Trench 5 backdirt.

Trench 6

Trench 6 was excavated approximately 9 m east of Trench 5 to sample Anomaly 6. Trench 6 was oriented east to west, was approximately 9 m in length by 1 m in width, and was excavated to an average depth of 100 cmbs (see Appendix A, Figure A-6). Feature 4 was found in the west end of Trench 6 and was sampled with hand excavation. An additional 468.28 g of fire-cracked rocks was collected from the Trench 6 backdirt.

Trenches 7 and 8

Trenches 7 and 8 were adjoining trenches that, combined, extended approximately 8 m in length by 3 m in width. They were excavated near the northeast corner of Area 3, approximately 8 m northeast of Trench 6, to sample anomalies 7 and 8. They were excavated to an average depth of 120 cmbs (see Appendix A, Figure A-7). No burned rock features were found in either trench, but both trenches contained large chunks of charred wood, presumably modern, in their upper stratum. One anvil stone and 435 g of fire-cracked rocks were collected from the backdirt.

Trench 10

Trench 10 was excavated near the northern limit of Area 3, to sample Anomaly 10. The trench extended approximately 9 m in length by 1 m in width and was oriented east to west. Trench 10 was excavated to an average depth of 120 cmbs (see Appendix A, Figure A-8). No cultural features were recorded during excavation, but 119.48 g of fire-cracked rocks was recovered from the trench backdirt. Like trenches 7 and 8, Trench 10 showed evidence of modern burning in its upper stratum.

Trench 11

Trench 11 was excavated near the southern limit of Area 1 to sample Anomaly 11. The trench was oriented east to west and extended approximately 7 m in length by 1 m in width. The trench was excavated to 80 cmbs and encountered clay subsoil at 70 cmbs (see Appendix A, Figure A-9). No cultural features were observed during trenching, but 357.12 g of fire-cracked rocks was recovered from the backdirt.

Trench 12

Trench 12 was excavated in the southeast corner of Area 1 to sample Anomaly 12. Trench 12 was oriented east to west and extended approximately 10 m in length by 1 m in width. It was excavated to an average depth of 110 cmbs (see Appendix A, Figure A-10). No cultural features were observed during excavation and only 1 piece of fire-cracked rock, with a mass of 47.7 g, was recovered from the backdirt.
5. NRHP Testing of Prehistoric Site 41LT56

**Trench 13**

Trench 13 was excavated in the southwest portion of Area 1 to sample Anomaly 13. It extended approximately 6 m east to west by 1 m north to south and was excavated to an average depth of 100 cmbs (see Appendix A, Figure A-11). One burned rock feature, Feature 9, was recorded in the west end of Trench 13. Feature 9 was further sampled with the hand excavation of Unit 9.

**Trench 16**

Trench 16 was excavated between trenches 11 and 12 in the southeast corner on Area 1 to sample Anomaly 16. Trench 16 was approximately 7 m long by 1 m wide and was excavated to an average depth of 100 cmbs (see Appendix A, Figure A-12). The trench was oriented east to west. No cultural features were observed during excavation of Trench 16, but two pieces of lithic debitage and 180.41 g of fire-cracked rocks were recovered from the backdirt.

**Trench 17**

Trench 17 was excavated near the center of Area 1 to sample Anomaly 17. The trench was approximately 8 m long by 1 m wide and was excavated to an average depth of 115 cmbs (see Appendix A, Figure A-13). It was oriented east to west. Feature 13 was exposed in the west end of the south wall of Trench 17. Feature 13 was further sampled with the hand excavation of Unit 12. Additionally, a cluster of four ground stone manos was found at 60 cmbs in the east end of the trench. An additional 1,037.12 g of fire-cracked rocks was recovered from the trench backdirt.

**Trench 19**

Trench 19 was excavated approximately 15 m north of Trench 17 to sample Anomaly 19. Trench 19 was approximately 7 m in length by 1 m in width and was excavated to an average depth of 120 cmbs (see Appendix A, Figure A-14). The trench was oriented east to west and exposed one burned rock feature, Feature 14, in the west end of the north wall (Figure 10). Feature 14 was not sampled further. The visible portion of the feature in the trench wall consisted of a cluster of five fire-cracked rocks that extended approximately 40 cm east to west at a depth of 55 cmbs. One mano and 391.99 g of fire-cracked rocks were recovered from the backdirt. One piece of lithic debitage and a medial biface fragment were found in a rodent burrow in the east end of the trench.

**Trench 21**

Trench 21 was excavated near the center of the north half of Area 1 to sample Anomaly 21. The trench extended roughly 7 m east to west by 1 m north to south and was excavated to an average depth of 120 cmbs (see Appendix A, Figure A-15). Feature 15 was exposed in the west end of the trench and Feature 16 was exposed midway along the south wall. Feature 15 was not further sampled. The visible portion of the feature in the trench profile consisted of a diffuse cluster of fire-
Figure 10
SITE 41LT56
FEATURE 14
NORTH WALL PROFILE
TRENCH 19

ATKINS

- Burned Rock
- Rodent Burrow
10YR 3/3 dark brown
- Heavy Root Disturbance
cracked rocks that extended approximately 80 cm north to south and from 35 to 55 cmbs (Figure 11). Feature 16 was further sampled with the hand excavation of Unit 11. Additionally, one piece of lithic debitage, one mano fragment, and 1,742.18 g of fire-cracked rocks were collected from the trench backdirt.

**Trench 23**

Trench 23 was excavated on the western limit of Area 1 to sample Anomaly 23. The trench extended approximately 7 m east to west by 1 m north to south. Trench 23 was excavated to an average depth of 110 cmbs (see Appendix A, Figure A-16). No cultural features were observed during excavation. One piece of lithic debitage, two manos, and 591.72 g of fire-cracked rocks were collected from the trench backdirt.

**Trench 24**

Trench 24 was excavated at the northern limit of Area 1 to sample Anomaly 24. The trench was oriented east to west and extended 10 m in length by 1 m in width. It was excavated to an average depth of 105 cmbs (see Appendix A, Figure A-17). Feature 17 was exposed in the east end of the trench. Feature 17 was not sampled with hand excavation. The exposed portion of the feature was an amorphous cluster of fire-cracked rocks approximately 60 cm in diameter at a depth of 70 cmbs (Figure 12). One piece of lithic debitage, a reworked Yarbrough dart point, and 397.34 g of fire-cracked rocks were recovered from Trench 24.

**Trench 27**

Trench 27 was excavated in the southwest corner of Area 1 to sample Anomaly 27. The trench extended 8 m east to west by 1 m north to south and was excavated to an average depth of 70 cmbs (see Appendix A, Figure A-18). No cultural features were found during trenching, but one piece of lithic debitage and 1,399.56 g of fire-cracked rocks were recovered from the trench backdirt.

**Trench 29**

Trench 29 was excavated in the south central portion of Area 1 to sample Anomaly 29. Trench 29 was oriented east to west and extended 7 m in length by 1 m in width. The trench was excavated to an average depth of 120 cmbs (see Appendix A, Figure A-19). Feature 10 was exposed in the west end of the trench. Feature 10 was not sampled with hand excavation. The visible portion of the feature in the trench floor consisted of a cluster of fire-cracked rocks that extended 40 cm east to west by 20 cm north to south at a depth of 25 cmbs (Figure 13). One mano and 2,398.96 g of fire-cracked rocks were collected from the Trench 29 backdirt.
Feature 15
Anomaly 21
Feature 16

Trench 21

Unit 11

7.5YR 4/4 brown

10YR 4/3 brown

Burned Rock

SITE 41LT56
FEATURE 15
WEST WALL PROFILE
TRENCH 21

ATKINS

Figure 11

Drawn by S. Laurence
Figure 12

SITE 41LT56
FEATURE 17
PLAN VIEW
TRENCH 24

Drawn by: S. Laurence
Figure 13
SITE 41LT56
FEATURE 10
PLAN VIEW
TRENCH 29

Drawn by: S. Laurence
5. NRHP Testing of Prehistoric Site 41LT56

**Trench 30**

Trench 30 was excavated approximately 7 m northwest of Trench 29 to sample Anomaly 30. Trench 30 extended 9 m east to west and 1 m north to south. The trench was excavated to an average depth of 130 cmbs and did not locate any cultural features (see Appendix A, Figure A-20). One ground stone muller and 91.27 g of fire-cracked rocks were recovered from the trench backdirt.

**Trench 33**

Trench 33 was excavated approximately 10 m northeast of Trench 30 to sample Anomaly 32. Trench 33 was oriented east to west and extended 7 m in length by 1 m in width. The trench was excavated to an average depth of 130 cmbs (see Appendix A, Figure A-21) and exposed two burned rock features in the west end of the trench, features 11 and 12. Features 11 and 12 were not sampled with hand excavation. Feature 11 was a small cluster of fire-cracked rocks that extended 40 cm north to south by 20 cm east to west at a depth of 30 cmbs (Figure 14). Feature 12 was east of Feature 11 and extended 50 cm east to west by 30 cm north to south at a depth of 80 cmbs (Figure 15). The trench backdirt contained an additional 947.56 g of fire-cracked rocks.

**Trench 34**

Trench 34 was excavated 10 m northeast of Trench 33 to sample Anomaly 34. It was oriented east to west and extended approximately 7 m in length by 1 m in width. It was excavated to 130 cmbs (see Appendix A, Figure A-22). Feature 19 was exposed in the west end of the trench. Feature 19 was a small cluster of fire-cracked rocks and was not sampled with hand excavation. The portion of the feature exposed by the backhoe extended 20 cm east to west by 40 cm north to south at a depth of 40 cmbs (Figure 16). One piece of lithic debitage and 81.33 g of fire-cracked rocks were recovered from the trench backdirt.

**Trench 39**

Trench 39 was excavated in the northeast portion of Area 1 to sample Anomaly 39. The trench was oriented east to west and extended approximately 6 m in length by 1 m in width. It was excavated to an average depth of 115 cmbs (see Appendix A, Figure A-23). No cultural features were encountered during trenching. One mano and 174.29 g of fire-cracked rocks were collected from the trench backdirt.

**Hand-excavation Units and Features**

Twelve units were excavated at 41LT56 (see figures 7 and 8). Units 1 through 4 were excavated to sample burned rock concentrations found during shovel testing. Units 5 through 12 were excavated to sample burned rock features found during mechanical trenching. In total, 10 features were sampled through hand excavation at 41LT56.
Figure 14

SITE 41LT56
FEATURE 11
PLAN VIEW
TRENCH 33

ATKINS

Burned Rock
Burned Rock

Figure 16
SITE 41LT56
FEATURE 19
PLAN VIEW
TRENCH 34

Drawn by S. Laurence
5. NRHP Testing of Prehistoric Site 41LT56

Units 1 and Unit 3

Units 1 and 3 were excavated to sample the burned rock concentration identified in Shovel Test 240. Shovel Test 240 was excavated along the western edge of Area 1 (see Figure 7). The shovel test yielded 23.08 g of fire-cracked rocks in levels 10 and 11.

Unit 1: Unit 1 was a 1-x-1-m unit excavated to 100 cmbs. Excavation yielded 42 pieces of lithic debitage, 1 unifacially modified flake, and 1 proximal biface fragment. Additionally, 1,715.45 g of fire-cracked rocks and 24.92 g of charred plant remains were recovered. Table 9 shows the vertical distribution of cultural materials recovered from Unit 1.

Table 9: Site 41LT56, Unit 1, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Unifacially Modified Flake</th>
<th>Dart Point Fragment</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<td>62.23^</td>
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<td>1</td>
<td>1</td>
<td>1,715.45</td>
<td>24.92</td>
</tr>
</tbody>
</table>

*1 microflake from Feature 1 float sample  
**971.34 g from Feature 1; ^ from Feature 2

Unit 3: Unit 3 was a 1-x-1-m unit excavated adjacent to the west side of Unit 1. Unit 3 was excavated to 100 cmbs. It yielded 46 pieces of unmodified lithic debitage, 2 ground stone fragments, 762.03 g of fire-cracked rocks, and 20.34 g of charred plant remains. Table 10 shows the vertical distribution of cultural materials from Unit 3.

Feature 1

Feature 1 was a small amorphous cluster of fire-cracked rocks exposed between 60 and 70 cmbs in the northern half of units 1 and 3 (Figure 17). The feature consisted of a crescent-shaped concentration of fire-cracked rocks contained within an area approximately 50 cm north-south by 55 cm east-west. It was composed of a single flat layer of fire-cracked rocks with no observable changes in soil color or texture from the surrounding fill. Feature 1 is thought to be the remains of a
Figure 17
SITE 41LT56
FEATURE 1
PLAN VIEW
UNIT 1 AND 3

- Root
- Burned Rock
- Rodent Burrow
disarticulated hearth. The feature consisted of 1,694.01 g of fire-cracked rocks. A 6-liter soil sample taken from amongst the feature rocks was retained for flotation and yielded a 7.03-g light fraction sample. Feature 1 light fraction samples were not submitted for macrobotanical analysis.

Table 10: Site 41LT56, Unit 3, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
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<tbody>
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<td>14.17</td>
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<td>723.52**</td>
<td>1.26***</td>
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<td>16.5</td>
<td>1.94</td>
</tr>
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<td>10</td>
<td>4^</td>
<td>2^</td>
<td>19.37^</td>
<td>-</td>
</tr>
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</table>

Total 46 2 762.03 20.34

*1 flake from Feature 1
**722.67 g from Feature 1
***From Feature 1; ^ from Feature 2

Feature 2

Feature 2 was encountered at 80 to 90 cmbs in units 1 and 3. Feature 2 consisted of a small concentration of cultural and noncultural materials that was encountered at the conformity between the E and Bt soil horizons. The cultural materials associated with Feature 2, including fire-cracked rocks, ground stone, lithic debitage, and charred plant remains, were likely originally associated with Feature 1 but became displaced through bioturbation and graviturbation. Noncultural materials associated with Feature 2 consisted of rocks that varied in size from small hematitic sandstone gravels to a large conglomeration of hematitic sandstone, quartz pebbles, and silicified wood. A 0.25-liter soil sample taken from amongst the feature rocks was retained for flotation but did not yield botanical remains.

Units 2 and 4

Units 2 and 4 were excavated to sample a burned rock concentration identified in Level 10 of Shovel Test 253. Shovel Test 253 was located near the center of Area 1. The shovel test yielded 63.6 g of fire-cracked rocks and 1.86 g of charred plant remains.
Unit 2: Unit 2 was a 1-x-1-m unit excavated to a depth of 120 cmbs. Shovel Test 253 comprised a 30-x-30-cm portion of the southwest corner of the unit. Artifacts recovered from Unit 2 include 43 pieces of unmodified lithic debitage, 7 utilized flakes, 1 biface, 1 Scallorn arrow point, 3 ground stone fragments, 30.64 g of charred plant remains, and 423.66 g of fire-cracked rocks. Table 11 shows the vertical distribution of artifacts from Unit 2.

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Biface</th>
<th>Scallorn Arrow Point</th>
<th>Ground Stone</th>
<th>Charred Plant Remains (g)</th>
<th>Fire-cracked Rock (g)</th>
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<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.19</td>
</tr>
<tr>
<td>6</td>
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<td>-</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>1</td>
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</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>9</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>0.83</td>
<td>79.9</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.11</td>
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</tr>
<tr>
<td>11</td>
<td>7</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<td>165.82</td>
</tr>
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<td>12</td>
<td>4</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>30.64</td>
<td>423.66</td>
</tr>
</tbody>
</table>

Unit 4: Unit 4 was a 1-x-1-m unit excavated adjacent to the west side of Unit 2 to a depth of 120 cmbs. Artifacts recovered include 49 pieces of lithic debitage, 1 unifacially modified flake, 1 proximal dart point fragment, 1 utilized flake, 1 ground stone fragment, 2 faunal bone fragments, 1,075.55 g of fire-cracked rocks, and 4.57 g of charred plant remains. Table 12 shows the vertical distribution of artifacts from Unit 4.

No cultural features were found during excavation of units 2 and 4. The fire-cracked rocks recovered from Shovel Test 253 and units 2 and 4 likely represent the remains of a disturbed burned rock feature that has been negatively impacted through post depositional turbative processes. Fire-cracked rocks occurred in the highest concentrations in levels 10 and 11 of Unit 2, but were not recovered in sufficient quantities to indicate the presence of an intact cultural feature. The relatively even distribution of fire-cracked rocks in Unit 4, along with the even distribution of other artifact classes in both units, is consistent with post depositional artifact cycling.
Table 12: Site 41LT56, Unit 4, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Unifacially Modified Flake</th>
<th>Utilized Flake</th>
<th>Dart Point Fragment</th>
<th>Ground Stone</th>
<th>Faunal Bone</th>
<th>Charred Plant Remains (g)</th>
<th>Fire-cracked Rock (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>118.68</td>
</tr>
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<td>6</td>
<td>1</td>
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<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>280.06</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>103.39</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>233.28</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.12</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
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<td>-</td>
<td>1</td>
<td>-</td>
<td>2.66</td>
<td>75.72</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>1</td>
<td>0.22</td>
<td>223.23</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>0.64</td>
<td>40.70</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.93</td>
<td>0.49</td>
</tr>
<tr>
<td>Total</td>
<td>49</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4.57</td>
<td>1,075.55</td>
</tr>
</tbody>
</table>

Unit 5

Unit 5 was a 1-x-1 m unit excavated to sample Feature 4, which was associated with Magnetic Anomaly 6 and exposed in the west end of Trench 6. The unit was excavated to a depth of 90 cmbs and yielded 25 pieces of unmodified lithic debitage, 2 utilized flakes, 1 ground stone fragment, 11,073.15 g of fire-cracked rocks, and 73.04 g of charred plant remains. Table 13 shows the vertical distribution of artifacts from Unit 5.

Feature 4

Feature 4 was an amorphous cluster of fire-cracked rocks encountered between 46 and 55 cmbs (Figure 18). The densest portion of the cluster extends approximately 55 cm north to south by 45 cm east to west. A diffuse scatter of rocks extends from the densest portion of the feature to the northwest. The feature was bisected during excavation along the north-south axis and a profile was drawn (see Figure 18). No changes in soil color or texture were observed within the feature. The feature profile in bisection revealed one to three layers of rocks sloping downward to the south. It is possible that Feature 4 was constructed in a shallow basin or on uneven ground and became disarticulated through postdepositional turbation. The distribution of fire-cracked rocks and other artifacts throughout the vertical column from Unit 5 suggests postdepositional turbative forces have impacted the feature. Feature 4 contained 10538.42 g of fire-cracked rocks. A 16-liter soil
sample taken from amongst the feature rocks was retained for flotation and yielded a 9.67-g heavy fraction sample. Feature 4 light fraction samples were not submitted for macrobotanical analysis.

Table 13: Site 41LT56, Unit 5, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Ground Stone</th>
<th>Charred Plant Remains (g)</th>
<th>Fire-cracked Rock (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>15*</td>
<td>2*</td>
<td>–</td>
<td>16.77*</td>
<td>395.01*</td>
</tr>
<tr>
<td>6</td>
<td>4*</td>
<td>–</td>
<td>–</td>
<td>22.49*</td>
<td>10,143.41*</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>23.97</td>
<td>59.77</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>2.24</td>
<td>212.93</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>–</td>
<td>1</td>
<td>7.57</td>
<td>262.03</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>2</td>
<td>1</td>
<td>73.04</td>
<td>11,073.15</td>
</tr>
</tbody>
</table>

* From Feature 4.

**Unit 6**

Unit 6 is a 1-x-1 m unit excavated to sample Feature 8, which was associated with Magnetic Anomaly 4 and exposed in the west end of Trench 4. The unit was excavated to 50 cmbs. Cultural materials recovered from Unit 6 include 12 pieces of lithic debitage, 1 utilized flake, 1 proximal biface fragment, 2,175.33 g of fire-cracked rocks, and 0.98 g of charred plant remains. Table 14 shows the vertical distribution of cultural materials from Unit 6.

Table 14: Site 41LT56, Unit 6, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Proximal Biface Fragment</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5*</td>
<td>–</td>
<td>–</td>
<td>2,095.01*</td>
<td>0.98*</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>–</td>
<td>–</td>
<td>54.96</td>
<td>–</td>
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<td>5</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>25.36</td>
<td>–</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>2,175.33</td>
<td>0.98</td>
</tr>
</tbody>
</table>

* From Feature 8.

**Feature 8**

Feature 8 was a shallow concentration of fire-cracked rocks encountered from 19 to 30 cmbs (Figure 19). The feature is diffuse and vaguely semicircular in plan and extends approximately 80 cm east to west by 90 cm north to south. The feature consists of a single layer of burned rocks resting on a level plane. No changes in soil color or texture were observed within the feature. Feature 8 is thought to represent a partially intact hearth. Feature 8 contained 2,095.01 g of fire-cracked rocks. A 10-liter soil sample was collected from amongst the feature rocks for flotation. The flotation sample yielded 9.38 g of light fractions, but the sample was not submitted for macrobotanical analysis.
Figure 18

SITE 41LT56
FEATURE 4
PLAN VIEW AND WEST BISECT PROFILE
UNIT 5

Drawn by: S. Laurence

L:\Projects\He\CLIENTS\Luminant\100016937 - Kansie 9 site\testing\Report\figure\Figure 18 - 41LT56 Feature 4
Unit 7

Unit 7 is a 1-x-1-m unit excavated to sample Feature 5, which was associated with Magnetic Anomaly 5 and first exposed in the west end of Trench 5. Unit 7 was excavated to 75 cmbs and yielded 34 pieces of lithic debitage, 2 utilized flakes, a Gary dart point, 2 ground stone manos, 5,859.50 g of fire-cracked rocks, and 0.25 g of charred plant remains. Table 15 shows the vertical distribution of cultural material from Unit 7.

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Gary Dart Point</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5*</td>
<td>17**</td>
<td>-</td>
<td>-</td>
<td>2**</td>
<td>5,830.26**</td>
<td>0.14**</td>
</tr>
<tr>
<td>6*</td>
<td>15</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>29.24</td>
<td>0.11</td>
</tr>
<tr>
<td>7*</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5,859.50</td>
<td>0.25</td>
</tr>
</tbody>
</table>

** From Feature 5.

Feature 5

Feature 5 was a diffuse cluster of fire-cracked rocks encountered between 31 and 55 cmbs. In plan, the feature extended approximately 80 cm east to west by 90 cm north to south (Figure 20). The feature consisted of a single layer of fire-cracked rocks resting on an even plane. It is thought to represent a relatively intact hearth. No changes in soil color or texture were observed within the feature. Feature 5 consisted of 5,830.26 g of fire-cracked rocks. A 6.71-g light fraction sample recovered from flotation of a 9-liter sample of feature matrix submitted to Macrobotanical Analysis contained oak (0.09 g) and hardwood (0.03 g) wood charcoal as well as carbonized hickory (0.13 g) and hickory/walnut (0.03 g) nutshells (see Appendix F).

Unit 8

Unit 8 was a 1-x-1-m unit excavated to sample Feature 7, which was exposed in the east end of Trench 3. Excavation yielded 28 pieces of lithic debitage, 1 distal biface fragment, 1 unifacially modified flake, 2 ground stone fragments, 16,166.26 g of fire-cracked rocks, 1.02 g of charred plant remains, 1 faunal bone fragment, and a fragment of burned clay. Table 16 shows the vertical distribution of cultural material from Unit 8.

Feature 7

Feature 7 was a dense circular cluster of fire-cracked rocks that extended in plan 66 cm north to south by 54 cm east to west (Figure 21). In profile, the feature extended from 57 to 71 cmbs.
Figure 20
SITE 41LT56
FEATURE 5
PLAN VIEW
UNIT 7

Lithic
Burned Rock
Ground Stone

Drawn by: S. Laurence

ATKINS
Feature 7 was bisected along the east-west axis during excavation, revealing three layers of rocks in the center of the feature. Feature 7 is thought to represent an intact hearth, possibly constructed in a shallow basin. Feature 7 contained 15,921.42 g of fire-cracked rocks. A 20.5-liter soil sample was collected from amongst the feature rock for flotation. An 18.85-g light fraction sample recovered from flotation submitted to Macrobotanical Analysis contained white oak group (0.01 g) and oak (0.02 g) wood charcoal; carbonized hickory (0.06 g) and hickory/walnut (0.06 g) nutshells; 0.01 g of carbonized stem (Grass family); and 0.06 g of indeterminable botanical (see Appendix F).

Table 16: Site 41LT56, Unit 8, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Distal Biface Fragment</th>
<th>Unifacially Modified Flake</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
<th>Faunal Clay</th>
<th>Burned Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>5*</td>
<td>1*</td>
<td>-</td>
<td>1*</td>
<td>15,921.42*</td>
<td>-</td>
<td>1*</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>108.55</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>65.21</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>19.62</td>
<td>1.02</td>
<td>-</td>
<td>-</td>
</tr>
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<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>49.0</td>
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<td>2.46</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
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<td>1</td>
<td>2</td>
<td>16,166.26</td>
<td>1.02</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

* From Feature 7.

Unit 9

Unit 9 was a 1-x-1-m unit at the west end of Trench 13. Excavation exposed Feature 9 and yielded 20 pieces of lithic debitage, 1 utilized flake, 1 ground stone fragment, 8,816.38 g of fire-cracked rocks, and 0.5 g of charred plant remains. Table 17 shows the vertical distribution of artifacts from Unit 9.

Table 17: Site 41LT56, Unit 9, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6*</td>
<td>12**</td>
<td>-</td>
<td>-</td>
<td>8,373.11**</td>
<td>0.17**</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>391.25</td>
<td>0.33</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>52.02</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>8,816.38</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*Level 6 = 44-60 cmbs

**From Feature 9.
Figure 21
SITE 41LT56
FEATURE 7
PLAN VIEW AND NORTH BISECT PROFILE
UNIT 8

Drawn by: S. Laurence
Feature 9

Feature 9 was a dense circular cluster of fire-cracked rocks that extended in plan 66 cm north to south by 60 cm east to west (Figure 22). The feature extended in profile from 44 to 60 cmbs. It was constructed of a single layer of rocks resting on a level plane. A slight darkening of the soil was observed immediately north of the feature, while a lighter line of soil ran along the eastern limit of the feature to the south. No textural differences were observed. The soil changes are thought to be krotovina. Feature 9 contained 8,373.11 g of fire-cracked rocks. A 10-liter soil sample was collected from amongst the feature rocks for flotation. A 3.92-g light fraction sample recovered from flotation submitted to Macrobotanical Analysis contained oak (0.01 g), hickory (0.01 g), and hardwood (0.01 g) wood charcoal; carbonized hickory (0.02 g) and hickory/walnut family (0.01 g) nutshells; and 0.01 g of indeterminable carbonized botanical (see Appendix F).

Unit 10

Unit 10 was a 1-x-1 m unit excavated to sample Feature 18, which was exposed in Trench 24. The unit was excavated to 102 cmbs. Excavation yielded 8 piece of lithic debitage, 3 utilized flakes, 983.73 g of fire-cracked rocks, and 0.40 g of charred plant remains. Table 18 shows the vertical distribution of cultural materials from Unit 10.

Feature 18

Feature 18 was a small amorphous cluster of fire-cracked rock that extended, in plan, 20 cm north to south and 32 cm east to west (Figure 23). In profile, it extended from 76 to 102 cmbs. The feature was disturbed during trenching and what remained was too fragmentary to confidently assess its form or function. The feature consisted of 682.32 g of fire-cracked rocks. A 3.5-liter soil sample was collected from amongst the feature rocks for flotation. A 1.21-g light fraction sample was recovered from flotation but was not submitted for macrobotanical analysis.

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>3*</td>
<td>–</td>
<td>682.32*</td>
<td>–</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>3</td>
<td>148.34</td>
<td>0.22</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>–</td>
<td>153.07</td>
<td>0.18</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>3</td>
<td>983.73</td>
<td>0.40</td>
</tr>
</tbody>
</table>

* From Feature 18.

Unit 11

Unit 11 was excavated to sample Feature 16, which was exposed in the south wall of Trench 21. The unit was 1 m by 60 cm and was excavated to 150 cmbs. Excavation yielded 58 pieces of lithic...
7.5YR 4/6 strong brown fine loamy sand

10YR 4/4 dark yellowish brown loamy sand

10YR 5/4 yellowish brown loamy sand

Burned Rock

Figure 22
SITE 41LT56
FEATURE 9
PLAN VIEW
UNIT 9

Drawn by S. Laurence
Figure 23

SITE 41LT56
FEATURE 18
PLAN VIEW
UNIT 10

Drawn by: S. Laurence
debitage, 4 utilized flakes, 2 Gary dart points, 1 distal biface fragment, 1 ground stone, 3,138.69 g of fire-cracked rocks, 10.83 g of charred plant remains, and 3 pieces of burned clay. Table 19 shows the vertical distribution of these materials.

### Table 19: Site 41LT56, Unit 11, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Used Flake</th>
<th>Utilized Flake</th>
<th>Gary Dart Point</th>
<th>Distal Biface Fragment</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
<th>Burned Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>6.93</td>
<td></td>
</tr>
<tr>
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<td>2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.04</td>
<td></td>
</tr>
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<td>6.14</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.38</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>70.31</td>
<td>1.45</td>
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<tr>
<td>7</td>
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<td></td>
<td></td>
<td></td>
<td>47.02</td>
<td>0.04</td>
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</tr>
<tr>
<td>8</td>
<td>5</td>
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<td></td>
<td></td>
<td>149.16</td>
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<tr>
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<td></td>
<td>39.80</td>
<td></td>
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<tr>
<td>10</td>
<td>3*</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>2,075.62*</td>
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<tr>
<td>11</td>
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<td></td>
<td></td>
<td>190.1*</td>
<td>1*</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>2</td>
<td></td>
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<td></td>
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<td>101.23</td>
<td></td>
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<tr>
<td>13</td>
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<td>14</td>
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<td>257.15</td>
<td>0.69</td>
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<td>15</td>
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<td></td>
<td></td>
<td></td>
<td>99.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3,138.69</td>
<td>10.83</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

* From Feature 16.

**Feature 16**

Feature 16 was a small circular cluster of fire-cracked rocks, approximately 30 cm in diameter (Figure 24). The feature was encountered in the south wall of Trench 21 at 90 to 105 cmbs. It is likely that the feature was significantly disturbed during trenching. Feature form or function could not be discerned with confidence. The feature consisted of 2,265.72 g of fire-cracked rocks. A 2-liter soil sample was collected from amongst the feature rocks for flotation. A 0.38-g light fraction sample was recovered from flotation but was not submitted for macrobotanical analysis.
Trench 21

7.5YR 4/4 brown

10YR 5/4 yellowish brown

Unit 11

Root Cast
Burned Rock
Lamellae (5YR 4/4 reddish brown sandy clay loam)

Figure 24
SITE 41LT56
FEATURE 16
PLAN VIEW
UNIT 11

Drawn by S Laurence
Unit 12

Unit 12 was a 1-x-1 m unit excavated to sample Feature 13, which was associated with Anomaly 17 and exposed in the southwest corner of Trench 17. It was excavated to 120 cmbs and yielded 23 pieces of lithic debitage, 1 lithic core, 3 utilized flakes, 1 untyped dart point, 4 ground stone fragments, 5,789.22 g of fire-cracked rocks, and 1.88 g of charred plant remains. Table 20 shows the vertical distribution of these materials.

Table 20: Site 41LT56, Unit 12, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Core</th>
<th>Utilized Flake</th>
<th>Untyped Dart Point</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
<th>Charred Plant Remains (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
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<td>2</td>
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</tr>
<tr>
<td>6</td>
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<td>1.63</td>
</tr>
<tr>
<td>11</td>
<td>2*</td>
<td>-</td>
<td>1*</td>
<td>1*</td>
<td>3*</td>
<td>5,226.06*</td>
<td>0.25*</td>
</tr>
<tr>
<td>12</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>108.34*</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>5,789.22</td>
<td>1.88</td>
</tr>
</tbody>
</table>

* From Feature 13.

Feature 13

Feature 13 was a dense circular cluster of fire-cracked rocks thought to represent the remains of a mostly intact hearth (Figure 25). In plan, the feature extended 78 cm north to south by 60 cm east to west. In profile it extended from 100 to 110 cmbs. The feature consisted of a single layer of fire-cracked rocks and rested on a level plane. The feature contained 5334.40 g of fire-cracked rocks. A 7.5-liter soil sample was collected from amongst the feature rocks for flotation. A 2.46-g light fraction sample recovered from flotation and submitted to Macrobotanical Analysis contained white oak group (0.03 g), oak (0.01 g), and hardwood (0.02 g) wood charcoal; carbonized hickory/walnut (0.05 g) nutshell; and 0.02 g of indeterminate carbonized botanical (see Appendix F).
IN SITE 41 LT 56
FEATURE 13
PLAN VIEW
UNIT 12

ATKINS

Figure 25
SITE 41LT56
FEATURE 13
PLAN VIEW
UNIT 12

Drawn by: S. Laurence

Projectile Point
Silicified Wood
Possible Quartz
Hematitic Sandstone
5. NRHP Testing of Prehistoric Site 41LT56

Artifact Assemblage Analysis

Chipped Stone Tools

A total of 64 chipped stone tools were recovered from site 41LT56, including 1 arrow point, 10 dart points, 9 bifaces, 5 unifacially modified flakes, and 39 utilized flakes.

Projectile Points

Ten of the 11 projectile points recovered are temporally diagnostic and include a Scallorn arrow point along with Gary, Palmillas, and Yarbrough dart points (Figure 26). These artifacts suggest site 41LT56 resulted, in part, from multiple occupations during the Archaic and Late Prehistoric periods.

Arrow Point (n = 1)

Scallorn: One arrow point was recovered from site 41LT56 (see Figure 26, Lot 468.1). It was formed from chert and is a nearly complete Scallorn specimen, missing its distal tip from a snap fracture. The extant body is triangular with straight, slightly serrated, lateral edges and distinct well-barbed shoulders. The stem is expanding with a straight basal edge. The absence of use-wear under low-power microscopy suggests this specimen was discarded after a manufacturing failure. Its mass is 0.81 g and it extends 18.02 mm in length, 16.81 mm in width, and 2.85 mm in maximum thickness. Scallorn arrow points are found across most of Texas and date to the Late Prehistoric period, ca A.D. 700 to 1200 (Turner and Hester 1999).

Dart Points (n = 10)

Gary: All five Gary dart points recovered from 41LT56 were formed from chert (see Figure 26, lots 551.1, 552.2, 206, 513.2, and 516.1). Lots 551.1 and 552.2 are incomplete and retain bases and a portion of the blades but are missing the distal tips from snap fractures. Lots 206, 513.2, and 516.1 are complete and appear to have been reworked. Lots 206, 513.2, and 516.1 have pointed tips, triangular-shaped bodies, straight lateral edges, indistinct shoulders, and long contracting stems. Lots 206 and 513.2 have straight basal edges, while 513.2 has a convex basal edge. All three appear to have been reworked. While their stems have remained relatively unaltered, their bodies appear diminished in both width and length. Lot 206 has a mass of 1.81 g and extends 32.48 mm in length by 14.53 mm in width, with a maximum thickness of 4.19 mm. Lot 516.1 has a mass of 1.84 g and extends 35.83 mm in length, by 14.25 in width, and 4.45 mm in maximum thickness. Lot 513.2 has a mass of 3.27 g and extends 43.89 mm in length by 15.33 mm in width, with a maximum thickness of 5.57 mm. Lots 555.1 and 555.2 both have triangular-shaped bodies, indistinct shoulders, long contracting stems, and convex basal edges. While 551.1 has straight lateral edges, typical of Gary dart points, 552.2 has uncharacteristically recurved lateral edges. Neither of the incomplete points
show evidence of utilization, suggesting abandonment upon failure. Lot 551.1 has a mass of 4.13 g and extends 30.52 mm in length by 20.86 mm in width, with a maximum thickness of 6.52 mm. Lot 552.2 has a mass of 8.07 g, and extends 39.82 mm in length by 26.52 mm in width and 7.95 mm in maximum thickness. The production range for Gary dart points spans the Middle to Transitional Archaic periods, ca 2500 B.C. to A.D. 800 (Turner and Hester 1999).

Palmillas: Lot 374.1 consists of a proximal and a medial fragment from the same chert Palmillas dart point (see Figure 26). The distal tip is missing. When the fragments are properly oriented, it is possible to discern its lanceolate-shaped body, recurved lateral edges, well-barbed shoulders, expanding stem, and convex basal edge. The stem appears bulbous due to the expanding stem and convex basal edge. An absence of use-wear suggests discard upon failure due to a material flaw. Lot 374.1 has a mass of 10.82 g and extends 20.97 mm in length by 18.16 mm in width, with a maximum thickness of 3.69. Points of this type have a wide distribution across the state of Texas and have a production range spanning the Middle to Late Archaic period (Turner and Hester 1999).

Yarbrough: Two Yarbrough points were recovered (see Figure 26, lots 183 and 582.1). Lot 183 is a complete chert Yarbrough dart point. This specimen has a pointed tip, triangular-shaped body, straight lateral edges with alternating beveling on the right side, distinct shoulders, a slightly expanding stem, and a straight basal edge. The stem and basal edges have been slightly ground. Its mass is 2.84 g and it extends 33.56 mm in length by 17.43 mm in width, with a maximum thickness of 6.24 mm. Lot 582.1 is a reworked, complete, chert Yarbrough dart point. It has a pointed tip, triangular-shaped body, with one straight lateral edge and one convex lateral edge, distinct shoulders, expanding stem, and a straight basal edge. While it has largely retained the same shape and characteristics typical of Yarbrough dart points, it has lost one of its shoulders and appears diminished in overall size after having been reworked. Lot 582.1 has a mass of 3.07 g, and extends 39.48 mm in length by 13.42 mm in width, with a maximum thickness of 6.94 mm. Yarbrough dart points date to the Archaic and possibly to later times (Turner and Hester 1999).

Untyped: Lot 487.1 is a stem fragment from an untyped dart point (see Figure 26). The extant stem has parallel edges and a straight basal edge. It has a mass of 0.88 g and is 11.93 mm in length by 13.04 mm in width, with a maximum thickness of 5.54 mm. Parallel-edged stems recovered in this part of Texas date generally to the Archaic period.

Lot 562.1 is an untyped, complete, chert dart point (see Figure 24). The specimen has a pointed tip, triangular-shaped body, one straight lateral edge and one convex lateral edge, distinct shoulders, expanding stem, and a straight basal edge. Lot 562.1 has a mass of 6.91 g and extends 47.32 mm in length by 16.66 mm in width and 10.87 mm in maximum thickness.

Bifaces (n = 9)

The 41LT56 biface assemblage includes nine specimens; eight are chert biface fragments, and one is a metaquartzite specimen that is sufficiently complete to assign to a reduction stage. The
metaquartzite specimen is also the only biface that showed use-wear under low-power microscopy. The fragmentary nature of the chert specimens, coupled with their lack of use-wear, points to discard after manufacturing failures.

Lot 464.1 (Figure 27) is a complete metaquartzite Stage 2 biface with patterned wear indicating use as a multipurpose tool. It retains a moderate amount of cortex and shows minimal thinning. Lot 464.1 has a rounded distal tip, one convex and one concave lateral edge, and a convex proximal end. Use-wear consistent with adzing activities is evidenced along 24.45 mm of the convex lateral edge, while use-wear consistent with scraping on medium-hard materials is observed along 8.53 mm of the concave lateral edge. Its mass is 107.67 g, and it is 71.15 mm in length, 54.56 mm in width, and 22.55 mm in maximum thickness.

The eight remaining biface specimens are too fragmentary to assign to a reduction stage. Lot 123.1 is a medial fragment that retains no cortex (see Figure 27). It has straight lateral edges and lacks evidence of utilization, suggesting abandonment after failure. It has a mass of 29.93 g, and extends 35.52 mm in length by 46.04 mm in width and 16.54 mm in maximum thickness.

Lot 189.1 is a lateral biface fragment that retains only a single convex lateral edge with minimal cortex and no evidence of utilization. Its mass is 11.21 g, and it is 34.49 mm in length by 29.53 mm in width, with a maximum thickness of 12.23 mm.

Lot 398.1 is a completely decorticated proximal biface fragment (see Figure 27). It has convex lateral edges and a convex distal edge with no evidence of utilization. Its mass is 1.95 g. It is 16.53 mm in length by 18.48 mm in width, with a maximum thickness of 5.76 mm.

Lot 460.1 is a decorticated proximal biface fragment with straight lateral edges, a slightly convex proximal edge, and lacks use-wear (see Figure 27). It has a mass of 8.64 g, and it extends 24.98 mm in length by 32.13 mm in width, with a maximum thickness of 8.57 mm.

Lot 510.1 is a proximal biface fragment represented by a proximal corner (see Figure 27). It is decorticated and retains a contracting stem with a straight proximal edge. This specimen lacks use-wear, suggesting abandonment after failure at a snap fracture. Its mass is 0.14 g, and it extends 7.56 mm in length by 9.31 mm in width, with a maximum thickness of 2.95 mm.

Lot 517.1 is a decorticated, pointed distal biface fragment with straight lateral edges and no evidence of utilization (see Figure 27). Its mass is 0.26 g, and it extends 11.16 mm in length by 9.57 mm in width by 1.99 mm in maximum thickness.

Lot 551.2 is a completely decorticated distal biface fragment with straight lateral edges and no evidence of utilization (see Figure 27). Its mass is 5.96 g, and it extends 21.81 mm in length by 25.26 mm in width and 8.04 mm in maximum thickness.
Figure 27

SITE 41LT56
BIFACES

Drawn by: S. Laurence

L:\Projects\He1\CLIENTS\Luminant\100016087 - Kosse 9 sites testing\Report\figures\Figure 27 - 41LT56 Bifaces

CENTIMETER

0 1 2 3 4 5
Lot 579.1 is a decorticated medial biface fragment (see Figure 27). It has straight lateral edges and lacks evidence of use-wear, suggesting discard after failure. Its mass is 2.08 mm, and it extends 16.55 mm in length by 15.36 mm in width and 5.74 mm in maximum thickness.

Unifacially Modified Flakes (n = 5)

Five unifacially modified flakes were recovered from site 41LT56. All five of these artifacts appear to have been utilized. The basic attributes of these materials are presented in Table 21. The wear patterns observed are consistent with cutting, sawing, and scraping. Scraping entails holding the tool with the working edge at an approximate right angle to the direction of use. Cutting and sawing both require the tool to be held with the working edge parallel to the direction of use. Sawing generally refers to use on harder materials such as bone or wood (Keeley 1980). Wear consistent with sawing on medium-hard materials was the most common wear type observed in the unifacially modified flake assemblage.

Table 21. Site 41LT56, Unifacially Modified Flake Attributes

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Material</th>
<th>Modified Edge (mm)</th>
<th>Modified Edge Shape/Location</th>
<th>Utilization</th>
<th>Use Material</th>
<th>Form</th>
<th>Thermal Alteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Chert</td>
<td>9.40</td>
<td>Straight/lateral</td>
<td>Sawing</td>
<td>Medium hard</td>
<td>Flake Fragment</td>
<td>None</td>
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<tr>
<td>145</td>
<td>Chert</td>
<td>5.01</td>
<td>Straight/lateral</td>
<td>Sawing</td>
<td>Medium hard</td>
<td>Broken Flake</td>
<td>Intentional</td>
</tr>
<tr>
<td>449.1</td>
<td>Chert</td>
<td>5.51</td>
<td>Straight/lateral</td>
<td>Cutting</td>
<td>Medium soft</td>
<td>Broken Flake</td>
<td>None</td>
</tr>
<tr>
<td>487.2</td>
<td>Chert</td>
<td>8.44</td>
<td>Convex/distal</td>
<td>Sawing</td>
<td>Medium hard</td>
<td>Flake Fragment</td>
<td>None</td>
</tr>
<tr>
<td>524.1</td>
<td>Chert</td>
<td>6.91</td>
<td>Straight/lateral</td>
<td>ScраЬping</td>
<td>Medium hard</td>
<td>Complete</td>
<td>None</td>
</tr>
</tbody>
</table>

Utilized Flakes (n = 39)

A total of 39 pieces of lithic debitage exhibit patterned use-wear and are categorized as utilized flakes. Utilized flakes are the most common chipped stone tool type recovered at site 41LT56 and account for 61 percent of the chipped stone tool assemblage. The basic attributes of these materials are presented in Appendix B, Table B-1. Wear patterns present in the utilized flake assemblage are consistent with cutting, sawing, scraping, and planing on materials that range from soft to hard. Lots 466.1 and 537.1 are the only utilized flakes that show wear indicative of use as multipurpose tools. Wear patterns consistent with cutting are the most common and are evidenced on 15 specimens. Scraping was evidenced on 13 specimens while sawing was evidenced on 10 and planing was evidenced on 3. Observed wear was consistent with use on a wide variety of materials, ranging from hard to soft. One utilized flake is quartz arenite; the remainder are chert.
Wear patterns consistent with use on medium-hard and medium-soft materials were the most common and each were present on 17 and 14 specimens, respectively. Wear patterns consistent with use on soft materials were evidenced on 5 specimens. Wear patterns consistent with use on medium-hard to hard materials were observed on 2 specimens while wear patterns consistent with use on hard materials was noted only once.

Based on the frequency of wear patterns consistent with different material types, the 41LT56 utilized flake assemblage was used on a wide variety of materials. The paucity of artifacts used on hard and medium-hard to hard materials suggests that wood working and bone working were less common than hide working and plant processing.

Debitage

The 41LT56 debitage assemblage is comprised of 735 pieces of nondiagnostic lithic debitage and includes 249 complete flakes, 233 broken flakes, 140 flake fragments, 106 debris, and 7 pieces of microdebitage. The microdebitage was recovered during flotation, while all other lithic materials were recovered from the screens during shovel testing or hand excavation. Broken flakes and flake fragments compose 50.7 percent of the debitage assemblage, while complete flakes and debris represent 48.3 percent of the assemblage.

The vast majority of the debitage assemblage is chert, which accounts for more than 90 percent of the assemblage. Metaquartzite is the next most common debitage raw material and accounts for just under 6 percent of the assemblage. The remainder of the assemblage is made up of quartz arenite (0.95 percent), silicified wood (1.63 percent), and mudstone (0.14 percent).

Ground Stone

Thirty-four ground stone tools were recovered from the site. The majority was classified as upper hand-held stones. These are the stones that are the most easily manipulated and supply pressure during the two primary mechanical operations of pounding and rubbing. Recognizing the range of use-related activities associated with any particular tool can be difficult; however, certain key attributes help to identify the different actions (or processes) and the range of materials that produced the distinctive wear found on specific tools (see ground stone methods in Chapter 4).

Examination under 10x power binocular magnification revealed seven types of wear on one or more tools: grinding, pecking, polishing, pitting, battering, striations, and grooves (Appendix B, Table B-2). Several of the stones were heavily eroded; however, on the basis of microscopic examination and comparison with known collections from the region (Aten 1983; Aten et al. 1976), the 30 tools were assigned to seven functional categories: abrader (n = 2), anvil stone (n = 1), mano (n = 18), mano/hammerstone (n = 5), pitted mano/hammerstone (n = 1), mano/scaper (n = 1), and muller (n = 2). Four indeterminate grinding stones were also recovered.
Seven distinct wear types (grinding, polish, pecking, battering, pitting, striations, and grooves) are present in the ground stone assemblage. Grinding is the most common wear type and is present on all 34 ground stones. Polish and pecking are each present on just over half of the specimens recovered. Pitting and striations are each present on 6 specimens (representing just over 18 percent), while grooves are present on 7 specimens.

Each ground stone specimen exhibits between one and six distinct types of wear. Most specimens exhibit more than one type of wear. Only one specimen exhibits only one wear type, and only one specimen exhibits six wear types. Three wear types are present on 14 specimens, which accounts for slightly more than 40 percent of the ground stone assemblage.

In general, the 34 ground, polished, and battered stone tools found at 41LT56 appear to be multipurpose tools, and their general morphology and associated wear patterns point to their use in a diverse range of activities such as food processing, tool manufacturing and maintenance, hide processing, and the pounding and grinding of nonfood substances such as ochre.

**Ceramics**

Three undecorated body sherds and one piece of burned clay were recovered from 41LT56. Two sherds recovered from Level 7 of Shovel Test 58 were determined to be part of the same vessel, reducing the total number of sherds to two. One small sherdlet (Lot 396.1) was recovered from Level 5 of Shovel Test 264.

Microscopic examination indicates that both sherds have nontempered very fine to fine sandy pastes. The general variation in color development suggests that both sherds represent vessels fired under variable firing conditions in an atmosphere containing insufficient or reduced amounts of oxygen (Rice 1987; Shepard 1976). Both sherds were too heavily eroded to determine their overall surface treatment or thickness; however, given their nontempered pastes and overall look, both sherds closely resemble the Bear Creek Plain types found in deep East Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf Coastal Plain sites (see Aten 1983; Ellis 1992, 1995, 2002; Jelks 1965; Story 1990). This suggests that the site may have had temporal and/or regional affiliations with prehistoric sites in the Big Cypress, Sabine, Neches, and Angelina river basins (see Perttula 2008) to the east-southeast or the Mossy Grove culture area to the south-southwest (see Story 1990).

**Faunal Remains**

Eight faunal bone specimens were recovered from 41LT56. Four fragments, one of which is burned, are too fragmentary to assess either species or form with confidence. Two burned diaphyseal fragment of small to medium-sized mammals were recovered from Level 8 of Shovel Test 263 and Level 11 of Unit 4. A right pelvic fragment of a *Neotoma floridana* (eastern woodrat) was recovered from Level 10 of Unit 4. Additionally, an armadillo scute was found in Level 4 of Shovel Test 205.
SUMMARY AND RECOMMENDATIONS

Site 41LT56 is thought to have resulted from multiple occupations throughout the Archaic and Late Prehistoric periods. Diagnostic artifacts include Gary, Palmillas, and Yarbrough dart points, a Scallorn arrow point, and two ceramic sherds.

Three subsite areas were identified during the present investigation. Analyses of the chipped and ground stone tools indicate that a variety of activities, including tool manufacture and maintenance, core reduction, subsistence processing, hide working, and ochre grinding took place on-site.

The presence of fire-cracked rocks in areas 1 and 3 also indicates subsistence resources were processed on-site. Seventeen burned rock features were identified at 41LT56. Charred plant remains recovered from features 5, 7, 9, and 13 indicate they resulted in part from the processing of hickory nuts. However, the paucity of preserved subsistence and/or spent fuel remains on-site indicates all three subsite areas lack significant data resources that would warrant NRHP inclusion. For these reasons, no further work is recommended in any of the subsite areas at site 41LT56.
NRHP TESTING OF PREHISTORIC SITE 41LT310

NATURAL SETTING

Site 41LT310 is located on a toeslope just above the Steele Creek floodplain at an approximate elevation of 365 ft msl (Figure 28). The soil at the site is Edge fine sandy loam, 5 to 12 percent slopes (Griffin 1997). Shovel testing revealed a yellowish brown fine sandy loam that ranged in depth between 20 and 100 cmbs, with an average depth of 39 cmbs, above yellowish red clay. The site was vegetated with dense young oak and elm trees with a dense understory of yaupon, greenbriar, and American beautyberry. The ground surface was not visible due to the dense vegetation. The site dimensions are roughly 140 x 100 m with the long axis oriented north-south.

PREVIOUS INVESTIGATIONS

The site was initially located through shovel testing during previous intensive archeological survey (Sherman et al. 2006). A total of 21 shovel tests were excavated at that time to define the boundaries of the site, of which 8 were culturally positive. Artifacts recovered from these shovel tests consisted of 36 pieces of nondiagnostic lithic debitage and 3 charcoal fragments.

WORK ACCOMPLISHED

Positional Control

Due to the dense vegetation on-site, a 20-m control grid was established with a hand-held compass and a 30-m tape. Pin flags were placed at 20-m grid intercepts across the site. After excavation, the locations of each shovel test and the hand-excavated unit were acquired with a hand-held Trimble GPS unit that has submeter accuracy with post-processing (see Figure 28).

Shovel Testing

Shovel testing was undertaken in two phases. During the first phase, 45 shovel tests were excavated at 20-m grid intercepts across the site. During the second phase, an additional 26 shovel tests were excavated at 10-m intervals around culturally positive shovel tests. Of the 71 shovel tests excavated, 23 contained cultural material, yielding 35 pieces of lithic debitage, 3 utilized flakes, 1 ground stone fragment, 1 biface, 2 prehistoric ceramic sherds (fitters), 0.16 g of charred plant remains, and 362.67 g of fire-cracked rocks.
Figure 28
Site 41LT310
Plan Map

Prepared By: Atkins/19895
Scale: 1" = 30m
Job No.: 100016087
Date: March 8, 2011
File: N:\Clients\KL\Luminant\Kosse\100016087\geo\figs\41LT310.mxd
Lithic artifacts are by far the most common class of artifacts recovered on-site. Between one and four lithic artifacts were recovered from each shovel test positive (Figure 29) for this class of material, with an average of 1.74 and a standard deviation of 1.053. Five shovel tests (12, 13, 14, 22, 29, and 33) had lithic artifact recovery rates more than one standard deviation above the mean.

Lithic artifacts were recovered from throughout the vertical column in levels 1 through 7. The vertical distribution of lithic artifacts is presented in Table 22. Levels 2 and 3 yielded the highest concentrations of lithic artifacts, with slightly lower concentrations in levels 1 and 4. Below Level 4, lithic artifact recovery rates fall precipitously.

<table>
<thead>
<tr>
<th>10-cm Level</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Fire-cracked rocks are the second most common class of cultural material recovered on-site. A total of 362.67 g of fire-cracked rocks was recovered through shovel testing, represented by 17 individual fragments from just four shovel tests (12, 13, 29, and 41). Most of the fire-cracked rocks recovered (more than 92 percent by mass) came from Shovel Test 13 in Level 4 (see Figure 29). Fire-cracked rocks were also obtained from levels 2, 3, 6, and 7. The three fragments of fire-cracked rocks from Shovel Test 13 were also the largest, by far, fragments recovered, with an average mass of 111.683 g.

Lithic tools were recovered from five shovel tests (13, 14, 34, 40, and 54), each of which yielded a single tool. Charcoal was rare on-site and was recovered only from Shovel Test 12. Both of the ceramic sherds were recovered from Shovel Test 41 (see Figure 29).

The patterned vertical distribution of lithic artifacts and fire-cracked rocks presumably resulted from a combination of both systemic and postabandonment natural and cultural processes. The concentration of artifacts in levels 2 through 4 suggests these levels may be considered an occupational zone that was close to the original living surface. The fact that fewer artifacts were recovered from Level 1 than levels 2, 3, or 4 suggests that the site may have aggraded somewhat since its prehistoric abandonment. However, this pattern may have resulted largely from postdepositional turbation from burrowing animals and trees that can cause vertical cycling of cultural materials.
Carbon (g), contour interval = 0.05  
Ceramic, contour interval = 0.5  
Debitage, contour interval = 0.5  
Fire-cracked Rock (g), contour interval = 40  
Lithic Tools, contour interval = 0.5
The patterned horizontal distribution of cultural material on-site presumably resulted from a combination of processes both before and after the site was abandoned. However, the turbative processes identified above are more likely to favor vertical displacement of cultural materials than lateral displacement.

Shovel testing revealed the presence of a single artifact high density and diversity area in the northwest corner of the site defined by shovel tests 12, 13, 14 and 44 (see Figure 29). This area extended roughly 40 m north-south by 20 m east-west. Cultural materials recovered from this area include eight pieces of debitage, 0.16 g of carbonized plant remains, 346.66 g of fire-cracked rocks, one utilized flake, and one ground stone fragment.

Shovel testing also revealed the presence of a small lithic debitage high density area defined by shovel tests 27, 29, and 49 extending roughly 30 m east-west by 10 m north-south (see Figure 29). Cultural materials recovered from this area include six pieces of lithic debitage and 5.18 g of fire-cracked rocks. This area was not considered to be an artifact high diversity area due to the absence of lithic tools and charred plant remains.

**Hand Excavation**

A single 1-x-1-m hand-excavated unit was placed just to the east of Shovel Test 12, in order to sample the artifact high density and diversity area and attempt to locate a cultural feature. Unit 1 was excavated to an average depth of 35 cmbs (Figure 30). The A horizon was a 10YR 4/3 brown sandy loam that extended from the ground surface to roughly 15 cmbs. The E horizon was a 10YR 4/3 to 10YR 5/3 brown sand that extended to about 30 cmbs. The underlying Bt horizon was a 5YR 5/8 yellowish red that extended to an unknown depth. This location was chosen because Shovel Test 12 yielded both fire-cracked rocks and charcoal. This work yielded 19 pieces of lithic debitage and 1 biface fragment. No cultural features were identified.

**Artifact Assemblage Analysis**

**Lithic Artifacts**

**Nontools**

A total of 54 nontools were recovered during testing. The nontool assemblage is composed exclusively of lithic debitage (Table 23) and consists of 23 complete chert flakes, 15 broken chert flakes, 13 chert flake fragments, 2 complete silicified wood flakes, and 1 chert debris fragment. The hand-excavated unit yielded 14 complete chert flakes, 3 broken chert flakes, and 2 chert flake fragments. The raw materials were presumably obtained locally.
10YR 4/3 brown sandy loam, many roots

Diffuse 10YR 4/3 brown to 10YR 5/3 brown sand, few roots

5YR 5/8 yellowish red clay
Morphological variation within the debitage assemblage varies markedly from what was observed in areas 1 and 3 at site 41LT56. Table 24 compares the ratio of morphological types present in the debitage assemblage at 41LT310 with areas 1 and 3 at 41LT56.

### Table 24: Debitage Morphology Ratio from Site 41LT310 and Areas 1 and 3 at 41LT56

<table>
<thead>
<tr>
<th></th>
<th>41LT310</th>
<th>41LT56 Area 1</th>
<th>41LT56 Area 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broken Flake</td>
<td>27.78</td>
<td>34.4</td>
<td>29.63</td>
</tr>
<tr>
<td>Complete flake</td>
<td>46.30</td>
<td>32</td>
<td>27.78</td>
</tr>
<tr>
<td>Debris</td>
<td>1.85</td>
<td>16</td>
<td>20.37</td>
</tr>
<tr>
<td>Flake Fragment</td>
<td>24.07</td>
<td>17.6</td>
<td>22.22</td>
</tr>
</tbody>
</table>

Compared to areas 1 and 3 at 41LT56, site 41LT310 has a much lower percentage of debris and a much higher percentage of complete flakes to other debitage types. In contrast, the two subsite areas at 41LT56 are thought to have resulted from more-intensive occupations that included a wider variety of tasks undertaken during longer and more-frequent occupational episodes.

The nontool assemblage from 41LT310 is thought to have resulted from a narrower range of activities undertaken during fewer occupational episodes. The high ratio of complete flakes to other debitage forms with a very low ratio of debris suggests a reduction strategy focused on the unintensive reduction of cores, presumably to produce expedient flake tools.

**Tools**

**Biface (n = 1)**

Lot 58.1 (Figure 31) is a chert biface fragment that conceivably represents the base or the tip of a dart point that failed in a hinge fracture. It has a mass of 1.21 g and extends 16.35 mm in length by 16.05 mm in width and 6.12 mm in maximum thickness. This specimen lacks patterned use-wear under low-power microscopy, suggesting it was discarded following a manufacturing failure. The hinge fracture is consistent with this interpretation.
Lot 30
Mano Fragment

Lot 39
Abrader/Knife Fragment

Lot 58.1
Proximal Biface Fragment

Lot 43
Conjoining Upper Body Ceramic Exterior

CENTIMETER

0 1 2 3 4 5

Figure 31
41LT310
LITHIC TOOLS AND CERAMIC ARTIFACTS

Drawn by: S. Laurence
Utilized Flakes (n = 3)

Lot 27.1 is a broken chert flake that exhibits wear along 6.35 mm of a straight lateral edge that is consistent with cutting activities on medium-soft material. Lot 27.1 has a mass of 1.53 g and extends 15.67 mm in length by 21.23 mm in width, with a maximum thickness of 3.75 mm.

Lot 42 is a complete chert flake that exhibits wear along 8.86 mm of a convex lateral edge for planing activities, and wear along 8.77 mm of a straight lateral edge for scraping on medium-soft materials. Lot 42 has a mass of 3.44 g and extends 25.89 mm in length by 27.11 mm in width, with a maximum thickness of 4.58 mm.

Lot 51 is a complete chert flake that exhibits wear along 6.85 mm of the proximal end of the straight lateral edge consistent with planing activities on medium-soft materials, and along 5.87 mm along the medial portion of the convex lateral edge for planing on medium-hard to hard materials. It also exhibits wear along 12.96 mm of the distal portion of the straight lateral edge and for 2.23 mm around the distal tip for planing on medium-soft materials. Lot 51 has a mass of 0.52 g and extends 19.37 mm in length by 10.68 mm in width, with a maximum thickness of 1.97 mm.

Ground Stones (n = 2)

Two ground stone tools were recovered at 41LT310 (Table 25). Both are upper hand-held stones. These are the stones that are the most easily manipulated and supply pressure during the two primary mechanical operations of pounding and rubbing. Recognizing the range of use-related activities associated with any particular tool can be difficult; however, certain key attributes help to identify the different actions (or processes) and the range of materials that produced the distinctive wear found on specific tools (see ground stone methods in Chapter 4).

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Mass (g)</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
<th>Raw Material</th>
<th>Tool Type</th>
<th>Grinding</th>
<th>Polish</th>
<th>Pecking</th>
<th>Groove</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>53.67</td>
<td>53.79</td>
<td>43.57</td>
<td>18.15</td>
<td>quartz</td>
<td>mano</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>22.98</td>
<td>65.75</td>
<td>24.95</td>
<td>12.81</td>
<td>silicified arenite wood</td>
<td>abrader/knife</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Examination under 10x power binocular magnification revealed the presence of four types of wear: grinding, polishing, pecking, and grooves. On the basis of microscopic examination, the recovered tools were assigned to two functional categories: abrader/knife and mano. The wear patterns found on these two tools point to their use in a range of activities and involved the working of both hard and soft substances.

The abrader/knife fragment (see Figure 31) is a silicified wood bladelike tool that appears to have been intentionally shaped and possibly hafted. It is planoconvex in profile with one relatively flat...
side and one bowed side. The more or less flat side of the tool exhibits a series of well-worn grooves. Both surfaces have several distinct ground and highly polished areas that are concentrated on the high-relief areas. In these areas, the interstices between the grains are free of debris, smooth, and as shiny as the grains themselves, and the polish has a lustrous, greasy appearance that may have resulted from friction against a softer material such as a hide. The tool is flat on one end, while on the opposite end it has been flaked to form a more or less pointed tip. The pointed end has been heavily ground forming a blunt tip with polish on high-relief areas. The tool appears to be relatively complete as the flat end is also highly polished. The wear patterns exhibited on this tool suggest both abrasive contacts with some type of soft material and/or frictional (tribochemical) wear processes that concentrated wear in the topographic lows as well as the high-relief grains (Adams 1988, 1996; Semenov 1964; Vaughan 1975).

Lot 30 (see Figure 31) is a mano fragment thought to represent about one-quarter of what was once an oval-shaped mano made of quartz arenite. Patches of grinding are visible on portions of one plane surface, and the wear extends around the remaining edges and end of the tool. Peck marks are randomly distributed across the face and ends. The wear occurs primarily on the high-relief areas, and there is microfracturing of the interstices between the grains. This suggests that the substance(s) being ground was relatively hard.

**Thermally Altered Rocks**

The thermally altered rock assemblage is composed of cracked hematitic sandstone rock fragments that have a combined mass of 362.67 g. The origin of these materials remains uncertain, though they presumably resulted from subsistence processing and represent disarticulated cultural features. However, this hypothesis remains unconfirmed due to the absence of cultural features on-site.

**Ceramic Artifacts**

Two small, undecorated upper body sherds (see Figure 31, Lot 43) were recovered from Level 5 of Shovel Test 41. The two sherds had fresh breaks and could be conjoined to form one sherd. Microscopic examination indicates that the conjoined sherd was from a vessel made from a nontempered, very fine sandy clay. The overall arrangement and orientation of the grains observed in the paste fabric is irregular in texture. The small, closely spaced irregularities observed across the face of the cross section are generally due to the presence of larger than average sand grains and bits of crushed hematite. The sherd is relatively thin with an average thickness of 4.5 mm. Its variation in color development suggests that the sherd represents a vessel fired under relatively variable firing conditions in an atmosphere containing insufficient or reduced amounts of oxygen. Its exterior and interior surfaces are too weathered to determine the original surface finish.

Based on the observed technological attributes, the sherd closely resembles the Bear Creek Plain types found in deep east Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf.
Coastal Plain sites (see Aten 1983; Ellis 1992, 1995, 2002; Jelks 1965; Story 1990). This suggests that site 41LT310 may have had temporal and/or regional affiliations with prehistoric sites in the Big Cypress, Sabine, Neches, and Angelina river basins (see Perttula 2008) to the east-southeast or the Mossy Grove culture area to the south-southwest (see Story 1990).

SUMMARY AND DISCUSSION

The low density and diversity of cultural materials present at 41LT310 suggest it resulted from at least one short-duration occupation sometime during the Late Prehistoric period. The only temporally diagnostic artifact was a ceramic sherd with possible affiliation with Bear Creek Plain types found in deep east Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf Coastal Plain sites. The three utilized chert flakes recovered exhibit patterned wear consistent with use on medium-soft to medium-hard materials, while the wear on the distal tip of the silicified wood abrader/knife fragment is consistent with grinding activities. The presence on-site of these chipped stone tools, ground stone tools, and fire-cracked rocks suggest that subsistence resources were processed during the prehistoric occupation. However, the absence of any preserved subsistence remains or intact cultural features prevents confirmation of this conclusion. These findings indicate that significant data resources that meet the criteria warranting NRHP inclusion are not present. Therefore, no further work is recommended at site 41LT310.
NRHP TESTING OF PREHISTORIC SITE 41LT387

NATURAL SETTING

Site 41LT387 is a large subsurface prehistoric lithic artifact scatter that extends across a broad toeslope and ridge summit that trends northwest-southeast and terminates at the confluence of Cox Creek and one of its unnamed tributaries (Figure 32). The western boundary of the site is formed by the Cox Creek floodplain. The soil in the north and west portions of the site is mapped as Edge fine sandy loam, 5 to 12 percent slopes (Griffin 1997). The soil in the south and east portions of the site, which is in an open pasture, is Edge fine sandy loam, 1 to 5 percent slopes (Griffin 1997). The soil within the floodplain of Cox Creek is Nahatche loam, frequently flooded (Griffin 1997). The soil observed in shovel tests excavated to determine the site boundaries was a sandy loam that varied in hue from light yellowish brown to brown to light grayish brown and usually extended in depth to more than 1 m. A yellowish brown to strong brown to light reddish brown clay was occasionally encountered below the sandy loam. Site 41LT387 extends roughly 175 m northwest-southeast by 410 m northeast-southwest and covers an area of roughly 71,750 m² (see Figure 32). It has an average elevation of 400 ft msl.

The highest and most level portion of the site, consisting of roughly the eastern one-third, is in open pasture and vegetated primarily with grasses, bull nettle, and cacti. The more-sloped portions of the pasture were spotted with brushy vegetation. Ground surface visibility within the pasture was limited to less than 5 percent. The northern edge and western two-thirds of the site are within an oak and elm woods with a dense brush understory consisting of yaupon, American beautyberry, and briar. The ground surface was not visible in the wooded portion of the site. Overall, the site appears to have maintained good depositional integrity; however, it is likely that it has been impacted to some degree by clearing, agriculture, and erosion.

PREVIOUS INVESTIGATION

Site 41LT387 was located during previous survey within the Kosse Mine (Sherman and Watkins 2007). At that time, 113 shovel tests were excavated to determine the horizontal and vertical extent of the site. Of these shovel tests, 47 were culturally positive, yielding 191 prehistoric artifacts, 98 of which are fragments of fire-cracked rocks. Artifacts recovered from the site at that time include 1 biface fragment, 2 lithic cores, 1 ground stone fragment, 1 Gary dart point, and 1 modified flake, which was utilized and had been thermally altered, as well as 86 pieces of nondiagnostic lithic
Figure 32
Site 41LT387
Plan Map

Prepared By: PBS&J/19895
Scale: 1" = 40m
File: CLients\KL\Luminant\Kosse\100016087\geo\figs\41LT387\overview.mxd

Job No: 100016087
Date: March 8, 2011
debitage. A charcoal fragment was also collected from Shovel Test 95, which also contained 67.32 g of fire-cracked rocks.

**WORK ACCOMPLISHED**

**Positional Control**

A control grid was established with a hand-held compass and a 30-m tape. Pin flags were set at 20-m grid intercepts across the site. The positions of all shovel tests, hand-excavated units, and mechanically excavated trenches were acquired with a Trimble GeoXT GPS device that obtains submeter accuracy with post-processing (see Figure 32).

**Shovel Testing**

Shovel testing was conducted during two phases. During the first phase, 149 shovel tests were excavated at 20-m grid intercepts across the entire landform harboring the site. A total of 56 shovel tests yielded cultural remains including 98 pieces of nondiagnostic lithic debitage, 2,216.79 g of fire-cracked rocks, 2 unifacially modified flakes, 1 arrow point, 1 dart point, 1 prehistoric ceramic sherd, 1 faunal bone fragment (broken into four pieces), and 1 glass shard.

Lithic debitage was the most common material class recovered during the first phase of shovel testing, followed by fire-cracked rocks. The recovery rate for lithic debitage ranged between 1 and 6 specimens for each shovel test positive for this material class, with an average of 1.96 and a standard deviation of 1.32. Five shovel tests (4, 23, 43, 59, and 66) had debitage recovery rates more than one standard deviation above the mean.

Fire-cracked rocks were recovered from 10 shovel tests (1, 12, 15, 16, 20, 27, 42, 59, 69, and 101). The mass in grams of fire-cracked rocks recovered from each shovel test positive for this material class ranged between 15.07 g and 457.23 g with a standard deviation of 199.28 g and an average of 221.68 g. Two shovel tests (1 and 42) had fire-cracked rock recovery rates greater than one standard deviation above the mean.

During the second phase of shovel testing, an additional 56 shovel tests were excavated at 10-m intervals, along cardinal directions, around shovel tests that contained concentrations of lithic debitage, fire-cracked rocks, or that yielded diagnostic lithic tools. A total of 43 shovel tests excavated during Phase II yielded cultural materials, including 119 pieces of lithic debitage, 807.9 g of fire-cracked rocks, 1 unifacially modified flake, 2 ceramic sherds, 19.72 g of charred plant remains, 1 biface, and 1 wire nail. The distribution of cultural materials recovered from both phases of shovel testing is depicted on Figure 33.
ARTIFACT DENSITY CLINES

Arrow Point, contour interval = 0.5

Carbon (g), contour interval = 2

Dart Point, contour interval = 0.05

Debitage, contour interval = 0.5

Fire-cracked Rock (g), contour interval = 40

Lithic Tool, contour interval = 0.1

Positive Shovel Test

Negative Shovel Test

SITE 41LT387
ARTIFACT DENSITY CLINES

Figure 33

Drawn by: C. Wallace
Horizontal Distribution of Cultural Materials

The results of both phases of shovel testing revealed the presence of three artifact high density and diversity subsite areas referred to as areas 1, 2, and 3. The boundaries between subsite areas were drawn based on the distribution of lithic debitage and lithic tools across the site. Area 1 is located in the northern half of the site, extends roughly 40 m north-south by 30 m east-west, and comprises roughly 840 m². Area 2 is located immediately to the south of Area 1. Area 2 extends roughly 90 m north-south by 35 m east-west and comprises about 2,005 m². Area 3 is located to the west of Area 2 and can be contained within a 20-m-diameter area; it comprises roughly 314 m².

Cultural materials recovered from shovel testing in Area 1 include 30 pieces of nondiagnostic lithic debitage and 553.79 g of fire-cracked rocks. Cultural materials recovered from Area 2, the largest subsite area, include 130 pieces of lithic debitage, 1,743.98 g of fire-cracked rocks, 6 lithic tools, and 2 ceramic sherds. Area 3 yielded 34 pieces of nondiagnostic lithic debitage and 158.3 g of fire-cracked rocks. Table 26 below compares the subsite areas by density of lithic debitage and fire-cracked rocks. Area 1 had the lowest density of lithic debitage of all of the subsite areas, with 0.036 artifacts per square meter, and a moderate density of fire-cracked rocks with 0.659 g per square meter. Area 2 is the largest subsite area and contained the highest concentration of fire-cracked rocks with 0.791 g for each m². Debitage was moderately concentrated in Area 2, where 0.075 artifacts were recovered for each square meter. Area 3 had the lowest concentration of fire-cracked rocks, with 0.504 g for each square meter, and the greatest concentration of lithic debitage, with 0.108 artifacts for each square meter.

Table 26: Site 41LT387, Fire-cracked Rock and Lithic Debitage Density by Subsite Area

<table>
<thead>
<tr>
<th>Area</th>
<th>Fire-cracked Rock (g/m²)</th>
<th>Debitage (#/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.659</td>
<td>0.036</td>
</tr>
<tr>
<td>2</td>
<td>0.791</td>
<td>0.075</td>
</tr>
<tr>
<td>3</td>
<td>0.504</td>
<td>0.108</td>
</tr>
</tbody>
</table>

The presence of fire-cracked rocks in all three of the subsite shovel testing assemblages suggests they arose, at least in part, through subsistence processing.

Table 27 compares the ratio of complete flakes, broken flakes, flake fragments, and debris by site area. All three subsite areas had similar ratios of broken flakes to other debitage forms. Area 3 had the highest ratio of complete flakes to other debitage forms, while Area 2 had the lowest. Area 2 also had the lowest ratio of debris to other debitage forms, while areas 1 and 2 had nearly identical ratios. Area 2 had the highest ratio of flake fragments to other debitage forms, while Area 3 had the lowest.
The above patterned variability suggests that the reduction strategies employed at each of the subsite areas may also have varied. The low ratio of complete flakes to other debitage types in Area 2, along with the high ratio of flake fragments to other debitage types, is more suggestive of tool use and maintenance than primary core reduction or tool production. In contrast, the high ratio of complete flakes and debris, along with a low ratio of flake fragments in areas 1 and 3, is more suggestive of core reduction and tool production than tool use and maintenance.

**Vertical Distribution of Cultural Materials**

The three subsite areas differed with respect to the vertical distribution of cultural materials. Table 28 shows the artifact recovery rate by level from all shovel tests excavated within each of the subsite areas.

<table>
<thead>
<tr>
<th>Level</th>
<th>Area 1 Debitage</th>
<th>Area 2 Debitage</th>
<th>Area 3 Debitage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debitage Percent</td>
<td>Debitage Percent</td>
<td>Debitage Percent</td>
</tr>
<tr>
<td>1</td>
<td>- 3.33</td>
<td>9 6.92</td>
<td>- 2.94</td>
</tr>
<tr>
<td>2</td>
<td>1 6.67</td>
<td>19 14.62</td>
<td>1 8.82</td>
</tr>
<tr>
<td>3</td>
<td>2 3.33</td>
<td>9 6.92</td>
<td>3 8.82</td>
</tr>
<tr>
<td>4</td>
<td>1 3.33</td>
<td>18 13.85</td>
<td>- 8.82</td>
</tr>
<tr>
<td>5</td>
<td>1 3.33</td>
<td>14 10.77</td>
<td>4 11.76</td>
</tr>
<tr>
<td>6</td>
<td>4 13.33</td>
<td>10 7.69</td>
<td>5 14.71</td>
</tr>
<tr>
<td>7</td>
<td>7 23.33</td>
<td>11 8.46</td>
<td>4 11.76</td>
</tr>
<tr>
<td>8</td>
<td>10 33.33</td>
<td>21 16.15</td>
<td>13 38.24</td>
</tr>
<tr>
<td>9</td>
<td>1 3.33</td>
<td>10 7.69</td>
<td>2 5.88</td>
</tr>
<tr>
<td>10</td>
<td>3 10.00</td>
<td>9 6.92</td>
<td>2 5.88</td>
</tr>
</tbody>
</table>

Within Area 1, debitage was unevenly distributed within the vertical column. Although debitage was recovered from throughout the vertical column, with the exception of Level 1, in Area 1, it was concentrated in levels 7 and 8, which yielded more than 56 percent of the Area 1 shovel testing debitage assemblage. This pattern can be partially attributed to postdepositional artifact cycling due to faunal and possibly floral turbation. The concentration of debitage and fire-cracked rocks in levels 7 and 8 suggests that this portion of the site has aggraded somewhat through colluvial deposition since its prehistoric abandonment. The fact that Area 1 is located on the shoulder of the landform topographically below Area 2 is consistent with this interpretation.
Within Area 2, debitage was more evenly distributed throughout the vertical column from levels 1 through 10, where 10-cm levels with high artifact recovery rates intervened between levels with low artifact recovery rates. The patterned vertical distribution of cultural materials in Area 2 is thought to be largely attributable to postdepositional artifact cycling caused by faunal and possibly floral turbation. There is no evidence that Area 2 aggraded since it was abandoned. This interpretation is strengthened by the fact that Area 2 is also located on the topographically highest part of the site.

Within Area 3, debitage was unevenly distributed throughout the vertical column and absent from levels 1 and 4. Debitage was heavily concentrated in Level 8, which yielded more than 38 percent of the Area 3 shovel testing debitage assemblage. The fact that the Area 3 Level 8 debitage assemblage was recovered from five different shovel tests suggests the concentration is not anomalous. Area 3 is located on the shoulder of the landform harboring the site and is topographically lower than Area 2. These observations suggest that Area 3 was subjected to some colluvial deposition, in addition to faunal and floral turbation, following its prehistoric abandonment.

**Mechanical Excavation**

Thirteen backhoe trenches were excavated to prospect for features in the high artifact density areas located through shovel testing at 41LT387. Two trenches were excavated in Area 1, 10 trenches were excavated in Area 2, and 1 trench was excavated in Area 3. Mechanical excavations were halted when features were found or when trenches reached 130 cmbs. Five burned rock features were identified in Area 2 as a result of trenching. One additional feature was found during hand unit excavation. No cultural features were identified in either areas 1 or 3.

**Trench 1**

Trench 1 was excavated near the southern limit of Area 1, between shovel tests 42 and 133. The trench was oriented east to west and extends 10 m in length by 1 m in width. Trench 1 was excavated to an average depth of 130 cmbs (Appendix C, Figure C-1). One proximal dart point fragment and 1,468.9 g of fire-cracked rocks were recovered from the trench backdirt. No cultural features were encountered during excavation. The fire-cracked rocks recovered from the backdirt presumably were associated with an unidentified burned rock feature.

**Trench 2**

Trench 2 was excavated at the north end of Area 2. The trench was oriented east to west and extended from Shovel Test 105 to 139. The trench was 10 m long by 1 m wide and was excavated to an average depth of 100 cmbs (Appendix C, Figure C-2). One ground stone muller and 495.23 g of fire-cracked rocks were recovered from the trench backdirt. No cultural features were encountered during excavation.
Trench 3

Trench 3 was excavated near the center of Area 1. It extended east from Shovel Test 135 to Shovel Test 43. The trench was 10 m in length by 1 m in width and was excavated to an average depth of 130 cmbs (Appendix C, Figure C-3). No cultural features were encountered during trenching; however, 317.70 g of fire-cracked rocks was recovered from the trench backdirt.

Trench 4

Trench 4 was located between shovel tests 4 and 145 in the northern portion of Area 2. The trench extended 10 m east to west and 1 m north to south. Trench 4 was excavated to an average depth of 120 cmbs. One burned rock feature, Feature 4, was recorded in the south wall of the trench (Figure 34). Additionally, 366.47 g of fire-cracked rocks, two pieces of lithic debitage, and two ground stone tools were collected from the trench backdirt. Feature 4 was sampled through hand excavation of Unit 6 (see Feature 4 below).

Trench 5

Trench 5 was excavated on the eastern limit of Area 2, between shovel tests 1 and 152. The trench extends 10 m east to west by 1 m north to south and was excavated to an average depth of 110 cmbs. Feature 2 was recorded in the south wall of the trench (Figure 35). One piece of lithic debitage was recovered from the trench backdirt. Feature 2 was sampled through hand excavation of units 2, 3, and 4 (see Feature 2 below).

Trench 6

Trench 6 was excavated between shovel tests 148 and 198 in Area 2. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 90 cmbs. Feature 1 was recorded in the east end of the trench against the north wall (Figure 36). Additionally, six pieces of lithic debitage, one ground stone tool, and 419.12 g of fire-cracked rocks were recovered from the trench backdirt. Feature 1 was sampled through hand excavation of units 1 and 5 (see Feature 1 below).

Trench 7

Trench 7 was located in Area 2 between shovel tests 12 and 153. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 120 cmbs (Appendix C, Figure C-4). No cultural features were encountered during excavation. Three pieces of lithic debitage, one proximal biface fragment, and 203.30 g of fire-cracked rocks were collected from the trench backdirt.
10YR 7/3 pale brown sandy loam, very thickly bedded, clear and wavy boundary, no mottles, single grain, many fine roots

10YR 8/1 white sandy loam, no mottles, small hematite inclusions, single grain

Feature 4

Root

Hematite FCR

Limestone FCR

Figure 34

SITE 41LT387
FEATURE 4, TRENCH 4
SOUTH WALL PROFILE
10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, many fine roots

10YR 8/1 white sandy loam, no mottles, small hematite inclusions, single grain
I 10YR 6/3 pale brown sandy loam, many fine roots
II 10YR 7/4 very pale brown sandy loam, few fine roots
III 10YR 7/3 very pale brown compact sandy loam, few roots

Limestone FCR, Feature 1

SOUTH WALL PROFILE

Figure 36
SITE 41LT387
FEATURE 1, TRENCH 6

Drawn by: S. Laurence
7. NRHP Testing of Prehistoric Site 41LT387

Trench 8

Trench 8 was excavated between shovel tests 13 and 158 in Area 2. The trench extended 10 m east to west by 1 m north to south. Trench 8 was excavated to an average depth of 120 cmbs (Appendix C, Figure C-5). Feature 6 was recorded in the east end of the trench. Four pieces of lithic debitage, one modified flake, and 2,538.97 g of fire-cracked rocks were collected from the trench backdirt. The fire-cracked rocks recovered from the backdirt presumably were associated with Feature 6. Feature 6 was sampled through hand excavation of Unit 8 (see Feature 6 below).

Trench 9

Trench 9 was excavated between shovel tests 162 and 195 in Area 2. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 120 cmbs (Appendix C, Figure C-6). No cultural features were encountered during trenching. One piece of lithic debitage and 916.41 g of fire-cracked rocks were collected from the trench backdirt. The fire-cracked rocks recovered from the backdirt likely were associated with a small unidentified burned rock feature.

Trench 10

Trench 10 was excavated between Shovel Test 186 and 193 in Area 2. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 120 cmbs (Appendix C, Figure C-7). One chert core, one ground stone tool, and 589.86 g of fire-cracked rocks were collected from the trench backdirt. However, no cultural features were observed during excavation.

Trench 11

Trench 11 was excavated between shovel tests 23 and 184 in Area 2. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 80 cmbs (Appendix C, Figure C-8). Four pieces of lithic debitage and 1,593.22 g of fire-cracked rocks were recovered from the trench backdirt, but no cultural features were observed during excavation. The fire-cracked rocks recovered from the backdirt presumably were associated with an unidentified burned rock feature.

Trench 12

Trench 12 was excavated between shovel tests 59 and 188 in Area 3. The trench extended 10 m east to west by 1 m north to south and was excavated to an average depth of 130 cmbs (Appendix C, Figure C-19). No cultural features were encountered during excavation, and no artifacts were recovered from the backdirt.

Trench 13

Trench 13 was excavated in Area 2 east of Shovel Test 161. It extended 10 m east to west and 1 m north to south and was excavated to an average depth of 40 cmbs. Feature 5 was recorded in the
west end of the trench (Figure 37). One ground stone tool and 2,957.11 g of fire-cracked rocks were collected from the trench backdirt. The fire-cracked rocks were presumably associated with Feature 5. Feature 5 was sampled through hand excavation of Unit 7 (see Feature 5 below).

**Hand Excavation**

**Units 1 and 5 (Feature 1)**

Unit 1 was a 1-x-1-m unit excavated to sample a burned rock feature (Feature 1) exposed in the base of Trench 6 along the north wall. Unit 1 was excavated to a depth of 130 cmbs. Feature 1 did not extend beyond the north wall of the trench into Unit 1. Subsequently, Unit 5 was excavated in the base of Trench 6, adjacent to the south wall of Unit 1, to expose the feature visible in the trench floor. Unit 5 was 1 m x 50 cm and was excavated to a depth of 120 cmbs.

Unit 1 yielded 116 pieces of lithic debitage, 3 lithic cores, 1 ground stone, 3 unifaces, 2 bifaces, 0.025 of charcoal, and 4,981.36 g of fire-cracked rocks. Unit 5 yielded 10 pieces of lithic debitage, 3,368.33 g of fire-cracked rocks and 1 utilized flake. Table 29 shows the vertical distribution of the artifacts from both units 1 and 5.

Table 29: Site 41LT387, Vertical Distribution of Artifacts from Units 1 and 5

<table>
<thead>
<tr>
<th>Level</th>
<th>Unit 1</th>
<th>Unit 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debitage</td>
<td>Fire-cracked Rock (g)</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>40.91</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>25.58</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>11.97</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>514.81</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>621.18</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>529.7</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>797.82</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>591.68</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>815.44</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>873.32</td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>158.95</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>4,981.36</td>
</tr>
</tbody>
</table>

* From Feature 1.

**Feature 1**

Feature 1 was a small amorphous cluster of fire-cracked rocks approximately 30 cm in diameter in plan (Figure 38). In profile, the feature extended from 99 to 110 cmbs. Feature 1 contained
10YR 6/3 pale brown sandy loam, many fine roots

10YR 7/4 very pale brown sandy loam, few roots

10YR 6/6 brownish yellow sandy loam, very compact, small and sparse hematite inclusions, no roots
Figure 38
SITE 41LT387
FEATURE 1
PLAN VIEW AND PROFILE
UNIT 5

Burned Rock

0 40
centimeters

Unit 1
Unit 5

10YR 7/4 pale brown
mottled with
7.5YR 5/6 strong brown

PLAN VIEW

Drawn by S. Laurence
3,220.00 g of fire-cracked rocks. A 5-liter soil sample was collected from amongst the feature rocks for flotation. Flotation yielded a 3.32-g light fraction sample; however, the sample was not submitted for macrobotanical analysis. Feature form and function could not be discerned due to the small size of the feature. It is likely that the feature was significantly disturbed during trenching.

**Units 2–4 (features 2 and 3)**

**Unit 2**

Unit 2 was excavated to sample Feature 2, a buried burned rock feature exposed in the south wall of Trench 5. Unit 2 was excavated to a depth of 85 cmbs. Excavation yielded 23 pieces of lithicdebitage and 24,890.30 g of fire-cracked rocks. Table 30 shows the vertical distribution of the cultural materials.

**Table 30:** Site 41LT387, Unit 2, Vertical Distribution of Cultural Material

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Fire-cracked Rock (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>31.64</td>
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<tr>
<td>6</td>
<td>4</td>
<td>362.22</td>
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<tr>
<td>7</td>
<td>2*</td>
<td>1,276.20*</td>
</tr>
<tr>
<td>8</td>
<td>–</td>
<td>20,285.61*</td>
</tr>
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<td>9</td>
<td>2</td>
<td>2,183.71</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>440.08</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>310.84</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>24,890.30*</td>
</tr>
</tbody>
</table>

* From Feature 2.

**Unit 3**

Unit 3 was excavated adjacent to Unit 2, also to sample Feature 2. Unit 3 was excavated to a depth of 110 cmbs. Excavation yielded 1 utilized flake, 38 pieces of lithic debitage, 2 lithic cores, and 5,284.34 g of burned rocks. Table 31 shows the vertical distribution of the cultural materials.

**Unit 4**

Unit 4 was excavated adjacent to Unit 2 to further sample Feature 2. Unit 4 was excavated to a depth of 110 cmbs. Excavation yielded 30 pieces of lithic debitage, 3 ground stone tools, and 16,054.45 g of fire-cracked rocks. Table 32 shows the vertical distribution these materials.
Table 31: Site 41LT387, Unit 3, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Utilized Flake</th>
<th>Core</th>
<th>Fire-cracked Rock (g)</th>
</tr>
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<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>4</td>
<td></td>
<td></td>
<td>119.47</td>
</tr>
<tr>
<td>8</td>
<td>4*</td>
<td></td>
<td></td>
<td>4,100.00*</td>
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<tr>
<td>9</td>
<td>3*</td>
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<td></td>
<td>153.36*</td>
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<td></td>
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<td>11</td>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>38</td>
<td>1</td>
<td>2</td>
<td>5,284.34</td>
</tr>
</tbody>
</table>

* From Feature 2.

Table 32: Site 41LT387, Unit 4, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Ground Stone</th>
<th>Fire-cracked Rock (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1*</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
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<td>7.75</td>
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<tr>
<td>6</td>
<td>1*</td>
<td></td>
<td>1,826.00*</td>
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<tr>
<td>7</td>
<td>5*</td>
<td></td>
<td>1,470.89*</td>
</tr>
<tr>
<td>8</td>
<td>2*</td>
<td>2*</td>
<td>3,580.00*</td>
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<td>9</td>
<td></td>
<td></td>
<td>1,078.79</td>
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<td>10</td>
<td>6</td>
<td></td>
<td>1,402.63**</td>
</tr>
<tr>
<td>10 &amp; 11</td>
<td></td>
<td>1**</td>
<td>6,540.00**</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>3</td>
<td>16,054.45</td>
</tr>
</tbody>
</table>

* From Feature 2, ** From Feature 3.

Feature 2

Feature 2 was a large dense cluster of fire-cracked rocks that extended in plan approximately 150 cm east to west and more than 100 cm north to south (Figure 39). The southern limit of the feature was not defined during excavation. Vertically, Feature 2 extended from 70 to 85 cmbs. The feature was bisected along its east-west axis during excavation. In profile the feature appeared to be primarily a single layer of rocks resting on a fairly level plane. No differences in soil color or
Figure 39
SITE 41LT387
FEATURE 2
PLAN VIEW AND PROFILE
UNITS 2, 3, AND 4
texture were detected between the feature and the surrounding soil during excavation. Feature 2 contained 32,692.06 g of fire-cracked rocks and 15 pieces of lithic debitage. Forty liters of soil were collected from amongst the feature rocks for flotation. Flotation yielded a 59.86-g light fraction sample. The sample was submitted to Macrobotanical Analysis for identification. It yielded oak (0.04 g) and hardwood (0.02 g) wood charcoal and 0.01 g of carbonized hickory/walnut nutshell (see Appendix F).

**Feature 3**

Feature 3 was a small cluster of fire-cracked rocks located in Unit 4 beneath Feature 2. In plan, the cluster was approximately 30 cm in diameter at the densest point, with small outlying clusters to the south and northeast (Figure 40). Vertically, it extended from 90 to 100 cmbs. Feature 3 contained 7,942.63 g of fire-cracked rocks and three ground stones. Flotation samples were not collected from Feature 3. Feature 3 is likely associated with Feature 2 and may represent fire-cracked rocks that were vertically displaced from Feature 2 through postdepositional turbation. It is also possible that Feature 3 represents the remains of a hearth that was recycled and used to form the much larger Feature 2.

**Unit 6 (Feature 4)**

Unit 6 was excavated to sample Feature 4, a burned rock feature exposed in the south wall of Trench 4. Unit 6 was excavated to a depth of 120 cmbs and yielded 3 ground stone fragments, 2.71 g of charred plant remains, 2 biface fragments, 1 Trinity dart point, 62 pieces of lithic debitage, and 19,298.51 g of fire-cracked rocks. Table 33 shows the vertical distribution these materials.

<table>
<thead>
<tr>
<th>Level</th>
<th>Debitage</th>
<th>Fire-cracked Rock (g)</th>
<th>Ground Stone</th>
<th>Charred Plant Remains (g)</th>
<th>Biface Fragment</th>
<th>Dart Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>2</td>
<td>6</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>-</td>
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<td>8</td>
<td>15</td>
<td>798.09</td>
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<td>2.71</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>7*</td>
<td>17,202.87*</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>399.95</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>499.68</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>273.55</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>19,298.51</td>
<td>3</td>
<td>2.71</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

*From Feature 4.
Burned Rock

10YR 7/4 very pale brown

ATKINS

Figure 40
SITE 41LT387
FEATURE 3
PLAN VIEW
UNIT 4

Drawn by: S. Laurence
Feature 4

Feature 4 was a large dense cluster of fire-cracked rocks (Figure 41). The size and shape of Feature 4 were not defined during excavation. Only a 1-x-1-m area was sampled. In profile the feature appears to be primarily a single layer of fire-cracked rocks resting on a level plane. In profile, the excavated portion of the feature extended from 76 to 90 cmbs. No visible soil staining or changes in soil texture were observed during excavation. Feature 4 contained 17,202.87 g of fire-cracked rocks. An 8-liter soil sample was collected from amongst the feature rocks for flotation. Flotation yielded a 3.37-g light fraction sample that was submitted to Macrobotanical Analysis for identification; it yielded oak (0.01 g) and hardwood (0.02 g) wood charcoal and 0.01 g of carbonized hickory/walnut family nutshell (see Appendix F).

Unit 7 (Feature 5)

Unit 7 was excavated to expose Feature 5, a burned rock feature exposed in the floor of the west end of Trench 13. The unit was excavated to a depth of 60 cmbs and yielded 15 pieces of lithic debitage and 46,472.54 g of fire-cracked rocks. Table 34 shows the vertical distribution of the cultural materials from the unit.

Table 34: Site 41LT387, Unit 7, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level*</th>
<th>Debitage</th>
<th>Fire-cracked Rock (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5^</td>
<td>372.25^</td>
</tr>
<tr>
<td>1 and 2</td>
<td>–</td>
<td>45,540.00^</td>
</tr>
<tr>
<td>2</td>
<td>6^</td>
<td>333.11^</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>227.18</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>46,472.54</td>
</tr>
</tbody>
</table>

*Level 1 = 13 to 40 cmbs, Level 2 = 40 to 50 cmbs, Level 3 = 50 to 60 cmbs; ^ From Feature 5.

Feature 5

Feature 5 was a large dense cluster of fire-cracked rocks that, in profile, extended from 13 to 50 cmbs. Feature 5 was sampled with a 1-x-1 m unit. The feature extended beyond the limits of the unit to the north, west, and east; therefore, the size of the feature was not determined (Figure 42). The portion of Feature 5 exposed in Unit 7 was bisected along the east-west axis during excavation. In profile the excavated portion of the feature consisted of at least two layers of rocks that were sloping downward slightly to the west, which may indicate the feature was constructed in a shallow basin or on uneven terrain. No changes in soil color or texture were observed within the feature during excavation. Feature 5 contained 46,245.36 g of fire-cracked rocks. A 23-liter soil sample was collected from amongst the feature rocks for flotation. A 49.2-g light fraction sample recovered from flotation was submitted to Macrobotanical Analysis for identification. It yielded hickory/pecan
10YR 7/4 very pale brown

10YR 5/4 yellow brown silty sand and organic matter, diffuse boundary, many fine roots

10YR 5/4 yellow brown compact silty sand, very diffuse boundary, many fine and medium roots

10YR 6/4 light yellow brown very compact sand, diffuse boundary, few fine roots

10YR 7/3 very pale brown very fine very compact sand, no roots
Bisect Line

10YR 6/4 light yellowish brown

PLAN VIEW

ATKINS

Figure 42
SITE 41LT387 FEATURE 5 PLAN VIEW AND PROFILE UNIT 7

Drawn by S. Laurence

Root
Limestone
Hematite
Silicified Wood
Trench 13 Removal

centimeters
(0.01 g) and hardwood (0.02 g) wood charcoal and 0.02 g of carbonized hickory/walnut nutshell (see Appendix F).

**Unit 8 (Feature 6)**

Unit 8 was excavated to sample Feature 6, a burned rock feature exposed in the floor of the east end of Trench 8. The unit was excavated to a depth of 125 cmbs and yielded 3 ground stone tools, 1 utilized flake, 1 untyped dart point fragment, 24 pieces of lithic debitage, 3 lithic cores, and 10,598.55 g of fire-cracked rocks. Table 35 shows the vertical distribution these materials.

<table>
<thead>
<tr>
<th>Level*</th>
<th>Debitage</th>
<th>Fire-cracked Rock (g)</th>
<th>Ground Stone</th>
<th>Core</th>
<th>Utilized</th>
<th>Dart Point Fragment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5^</td>
<td>264.72^</td>
<td>-</td>
<td>-</td>
<td>1^</td>
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</tr>
<tr>
<td>1 and 2</td>
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<td>8,233.41^</td>
<td>1^</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>2</td>
<td>5^</td>
<td>491.59^</td>
<td>-</td>
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<tr>
<td>Total</td>
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<td>10,598.55</td>
<td>3</td>
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</table>

*Level 1 = 65 to 75 cmbs, Level 2 = 75 to 85 cmbs, Level 3 = 85 to 95 cmbs, Level 4 = 95 to 105 cmbs, Level 5 = 105 to 115 cmbs, Level 6 = 115 to 125 cmbs; ^ From Feature 6.

**Feature 6**

Feature 6 was a small dense cluster of fire-cracked rocks thought to be the remains of a relatively intact hearth (Figure 43). In plan, the feature was approximately 60 cm in diameter, while in profile it extended from 70 to 75 cmbs. The feature was bisected along the east-west axis during excavation revealing a single layer of rocks resting on a level plane. No evidence of soil staining or changes in soil texture were observed during excavation. The feature contained 8,989.72 g of fire-cracked rocks, one ground stone, and one utilized flake. An 11-liter soil sample was collected from amongst the feature rocks for flotation. A 5.19-g light fraction sample was recovered from flotation and was submitted to Macrobotanical Analysis for identification.

**Artifact Assemblage Analysis**

**Chipped Stone Tools**

Four projectile points, seven bifaces, six unifacially modified flakes, and five utilized flakes were recovered from site 41LT387. Three of the projectile points could be typed as a Perdiz arrow point, a Neches River dart point, and a Trinity dart point (Figure 44). The three identifiable projectile points indicate Middle to Late Archaic and Late Prehistoric occupations.
Figure 43
SITE 41LT387
FEATURE 6
PLAN VIEW AND PROFILE
UNIT 8

Drawn by: S. Laurence
Arrow Point (n = 1)

Lot 259 (see Figure 44) is a nearly complete Perdiz arrow point formed from chert. The distal tip and a portion of the base are missing. The body is triangular with straight heavily serrated lateral edges, distinct sharp barbed shoulders, and a contracting stem. Its mass is 1.81 g, and it extends 25.74 mm in length by 15.33 mm in width with a maximum thickness of 3.56 mm. Perdiz arrow points date to the Late Prehistoric, between A.D. 1200 to 1500 (Turner and Hester 1999).

Dart Points (n = 3)

Lot 260.1 is a Neches River dart point (see Figure 44) formed from chert. It has a triangular body, a pointed tip, straight lateral edges that are serrated along their lower two-thirds, beveling on one side, indistinct shoulders, a parallel-edged stem, and a rounded basal edge. Flakes have been removed across the entirety of the specimen, with additional thinning along the stem and lateral edges. Its mass is 3.36 g, and it extends 36.62 mm in length by 14.76 mm in width, with a maximum thickness of 6.13 mm. Neches River dart points date to the Middle Archaic (Turner and Hester 1999).

Lot 337.1 is a small complete silicified wood Trinity dart point (see Figure 44). It has a lanceolate-shaped body, retains some cortex, convex lateral edges with alternating beveling on the right side, indistinct shoulders, a slightly expanding stem with a slightly convex basal edge, and minimal grinding on the stem edges. A large flake has been removed across the entirety of the specimen, and minimal additional thinning is present along the lateral edges, leaving a slight medial ridge on one face. Although no use-wear was observed, the presence of beveling suggests this specimen was resharpened prior to discard. It has a mass of 4.29 g, with a length of 30.48 mm, a width of 17.81 mm, and a maximum thickness of 7.27 mm. Trinity dart points date from the Middle to Late Archaic (Turner and Hester 1999).

Lot 343.1 is the distal fragment of an untyped dart point (see Figure 44). This specimen has a pointed distal tip, slender triangular-shaped body, slightly convex lateral edges, one extant shoulder, and a contracting stem. The majority of the base and half of the body are missing. It has been modified along 13.58 mm of the broken recurved lateral edge, suggesting recycling after failure. The modified edge was utilized for planing on medium-soft materials. Its mass is 3.54 g, and it extends 49.71 mm in length by 15.26 mm in width, with a maximum thickness of 4.91 mm.

Bifaces (n = 7)

Testing at 41LT387 yielded seven chert bifaces (see Figure 44), of which three are sufficiently complete to assign to a reduction stage. Four specimens exhibit patterned use-wear under low-power microscopy.
Lot 332.2 is a nonorientable chert biface fragment (see Figure 44). It lacks patterned use-wear and was likely discarded after failure. It has a mass of 4.39 g, and it extends 25.66 mm in length by 26.14 mm in width, with a maximum thickness of 6.55 mm.

Lot 213 is a complete Stage 3 biface (see Figure 44). It has a pointed tip, lanceolate-shaped body, with one convex and one concave lateral edge, and a convex proximal edge. The distal tip shows evidence of utilization as a drill on soft to medium-soft materials. It has a mass of 8.08 g, and it extends 46.61 mm in length by 16.51 mm in width, with a maximum thickness of 11.54 mm.

Lot 266.1 is a Stage 3 proximal biface fragment. The distal half is absent due to a hinge fracture at a material flaw (see Figure 44). The specimen is completely decorticated and has slightly convex lateral edges and a convex proximal edge. No evidence of utilization was detected under low-power microscopy, suggesting discard after failure. It has a mass of 19.56 g, and it extends 38.14 mm in length by 47.59 mm in width, with a maximum thickness of 7.72 mm.

Lot 286.1 is a Stage 2 biface (see Figure 44). It has an irregularly shaped body and retains a moderate amount of cortex. It has a rounded distal tip, one concave and one convex lateral edge, and a straight proximal end. It was utilized along 4.60 mm of the concave lateral edge as a spokeshave on medium-soft to medium-hard materials. It also has polish and wear along the convex distal edge consistent with use on soft materials, such as animal hides. Its mass is 27.11 g, and it extends 56.23 mm in length by 23.13 mm in width and 18.19 mm in maximum thickness.

The three remaining bifaces were too fragmentary to assign to a reduction stage category. Lot 261.1 is a proximal fragment that retains no cortex (see Figure 44). It has convex lateral and proximal edges. This specimen exhibits wear along 12.45 mm of the broken straight distal edge consistent with scraping on soft materials, indicating it was recycled and reused after failure. It has a mass of 14.22 g, and it extends 36.51 mm in length by 29.01 mm in width, with a maximum thickness of 11.86 mm. Lot 288.1 is also a proximal fragment, with some cortex remaining (see Figure 44). It has straight lateral edges and a straight proximal edge. Evidence of utilization along 7.89 mm of a straight lateral edge is consistent with cutting soft materials. Lot 288.1 has a mass of 9.58 mm, and it extends 25.35 mm in length by 35.78 mm in width, and 11.74 mm in maximum thickness. Lot 334.1 is a completely decorticated distal biface fragment. The proximal portion is missing in a snap fracture at a material flaw (see Figure 44). It has a pointed distal tip, a triangular-shaped body, and straight lateral edges. It lacks evidence of utilization, suggesting discard after failure. It has a mass of 1.83 g and it extends 19.82 mm in length by 11.87 mm in width, with a maximum thickness of 7.29 mm.

Unifacially Modified Flakes (n = 6)

Six unifacially modified flakes were recovered. The basic attributes of these materials are recorded in Table 36. All of the unifacially modified flakes recovered from site 41LT387 exhibit patterned use-wear. One specimen shows wear indicative of use as a multipurpose tool. Wear patterns
present in this assemblage are consistent with scraping, planing, adzing, and sawing activities. For scraping and planing, the tool is held with the working edge at an approximate right angle to the direction of use. With planing, the flake edge is pushed, while with scraping, the flake edge is pulled (Keeley 1980). Cutting and sawing both require the flake to be held with the working edge parallel to the direction of use. Sawing is generally used to describe use on harder materials such as bone or wood (Keeley 1980). Adzing refers to repeated downward firm strikes against a working surface with the tool edge held at a low angle. Adzing creates a beveled working edge with a relatively low angle compared to edges created by a chopping motion. When adzing, the downward strikes are lighter and quicker than in chopping (Keeley 1980).

Table 36. Unifacially Modified Flake Attributes at Site 41LT387

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Material</th>
<th>Modified Edge (mm)</th>
<th>Modified Edge Shape/Location</th>
<th>Wear Type</th>
<th>Use Material</th>
<th>Form</th>
<th>Thermal Alteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>89.1</td>
<td>Quartz arenite</td>
<td>10.65</td>
<td>Straight/lateral</td>
<td>Scraping</td>
<td>Medium soft</td>
<td>Flake Fragment</td>
<td>None</td>
</tr>
<tr>
<td>90</td>
<td>Chert</td>
<td>25.85, 10.79</td>
<td>Slightly convex/distal, Recurved/lateral</td>
<td>Adzing, planing</td>
<td>Medium hard, soft-medium soft</td>
<td>Broken Flake</td>
<td>None</td>
</tr>
<tr>
<td>231</td>
<td>Chert</td>
<td>8.92</td>
<td>Straight/lateral</td>
<td>Sawing</td>
<td>Medium hard</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>267.1</td>
<td>Chert</td>
<td>8.71</td>
<td>Straight/lateral</td>
<td>Planing</td>
<td>Soft</td>
<td>Broken Flake</td>
<td>None</td>
</tr>
<tr>
<td>282.1</td>
<td>Chert</td>
<td>8.68</td>
<td>Convex/distal</td>
<td>Scraping</td>
<td>Medium hard</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>286.2</td>
<td>Chert</td>
<td>17.75</td>
<td>Convex/distal</td>
<td>Planing</td>
<td>Medium hard</td>
<td>Flake Fragment</td>
<td>None</td>
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</tbody>
</table>

Utilized Flakes (n = 5)

Five pieces of lithic debitage were recovered that, under low-power microscopy, exhibit patterned use-wear consistent with perforating or cutting. The basic attributes of these items are presented in Table 37. Cutting was the predominant activity and is evidenced on four of the five utilized flakes recovered. The observed patterned wear is consistent with use on soft to medium-soft materials, suggesting the utilized flakes could have been used for hide processing.

Table 37: Utilized Flake Attributes at Site 41LT387

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Material</th>
<th>Utilized Edge (mm)</th>
<th>Modified Edge Shape/Location</th>
<th>Wear Type</th>
<th>Use Material</th>
<th>Debitage Morphology</th>
<th>Thermal Alteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>181</td>
<td>Chert</td>
<td>9.44</td>
<td>Beaked/distal</td>
<td>Perforating</td>
<td>Medium soft</td>
<td>Complete</td>
<td>None</td>
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<tr>
<td>186</td>
<td>Chert</td>
<td>7.27</td>
<td>Straight/distal</td>
<td>Cutting</td>
<td>Soft</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>293.1</td>
<td>Chert</td>
<td>6.13</td>
<td>Straight/distal</td>
<td>Cutting</td>
<td>Soft</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>304.1</td>
<td>Chert</td>
<td>14.31</td>
<td>Slightly convex/distal</td>
<td>Cutting</td>
<td>Medium soft</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>342.1</td>
<td>Chert</td>
<td>12.39</td>
<td>Straight/lateral</td>
<td>Cutting</td>
<td>Medium soft</td>
<td>Complete</td>
<td>None</td>
</tr>
</tbody>
</table>
Nontools

The lithic nontool assemblage includes 557 pieces of nondiagnostic lithic debitage and 9 lithic cores. The debitage assemblage includes 119 complete flakes, 163 broken flakes, 155 flake fragments, and 120 pieces of debris. Raw material types represented in the debitage assemblage include 450 chert specimens, 74 silicified wood specimens, 29 metaquartzite specimens, and 4 quartz arenite specimens. Raw material types represented by the core assemblage include 3 chert specimens, 2 metaquartzite specimens, 1 quartz arenite specimen, and 3 silicified wood specimens.

Ground Stone Tools

Seventeen ground stone tools were recovered from 41LT387 (Table 38), including both lower stones and upper hand-held stones. Examination under 10x power binocular magnification revealed the presence of seven types of wear on one or more tools: grinding, polishing, pecking, battering, pitting, striations, and grooves.

On the basis of microscopic examination, the recovered tools were assigned to seven functional categories: abrader (n = 3), abrader/hammerstone (n = 1); muller (n = 3), mano (n = 2), mano/hammerstone (n = 5); mano/abrader (n = 1); and mano/abrader/hammerstone (n = 1). One small, polished flake (Lot 278.1) on a larger ground stone tool was too small and fragmented to assign to a specific functional category.

Abraders

Three abrader fragments were recovered. While tools assigned to this category are small enough to comfortably be held in the hand, functionally they serve as stationary platforms that absorb the pressure of rubbing. Two of the three tools were recovered from Unit 6, one from Level 6 (Lot 332.1) and one from Level 10 (Figure 45, Lot 336.2). One fragment (Lot 345.11) was recovered from Unit 8, Level 10. All were made from silicified wood. The three tools assigned to this category exhibit a variety of wear patterns, but all have at least one or more grooves cut into the surface. Wear on these tools most often results from the abrasive use of the stone to grind, smooth, shape, or sharpen a variety of implements such as grinding the base of a projectile point, straightening and polishing an arrow shaft, and/or sharpening the tip of a digging stick.

Abrader/Hammerstone

One tool (see Figure 45, Lot 316.4) was classified as an abrader/hammerstone. This tool is nearly spherical and just over 37 mm at its widest point. Grinding has rounded the stone, and it exhibits a number of linear grooves that encircle the stone. Battered or crushed areas dot its surfaces. Based on observed wear patterns, it is possible that some type of cording had been wrapped around the tool and the battered areas resulted from it banging against other hard objects. It is also possible that it served as a net weight; however, its precise function is unknown.
Table 38. Ground Stone Attributes at Site 41LT387

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Trench</th>
<th>Unit</th>
<th>Feat</th>
<th>Level</th>
<th>cmbs</th>
<th>Weight (g)</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
<th>Raw Material</th>
<th>Classification</th>
<th>Grind.</th>
<th>Polish</th>
<th>Pecking</th>
<th>Battering</th>
<th>Pitting</th>
<th>Striations</th>
<th>Groove</th>
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<td></td>
<td></td>
<td>45.72</td>
<td>46.03</td>
<td>32.58</td>
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<td>Sublitharenite</td>
<td>Muller</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>56.97</td>
<td>33.8</td>
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<td>Metaquartzite</td>
<td>Muller</td>
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<td>101.97</td>
<td>65.09</td>
<td>39.11</td>
<td>27.38</td>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
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<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
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</tr>
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</table>
SITE 41LT387
ABRADERS, ABRADER/HAMMERSTONE, AND MULLERS

ATKINS

Figure 45

CENTIMETER

0 1 2 3 4 5

Drawn by: S. Laurence
Three small ovoid-shaped mullers were recovered. These small grinding tools were distinguished from the manos in that they were manipulated with the fingers rather than the palm of the hand and employed a circular rather than a back-and-forth motion (Barr 1960; Kraybill 1977; Riddell and Pritchard 1971). All three tools have a polished surface sheen, and little microfracturing of the interstices between the grains is present. The absence of striations suggests that these tools were probably used to grind softer seeds (such as sunflower seeds) or vegetal material (such as fresh corn kernels or nutmeats) that would be less likely to produce deep striations, but would result in a rounding of individual stone grains and the eventual development of a surface sheen (see Adams 1996). It may also indicate that they were used in tandem with a softer grinding platform, such as a basket (see Smith 1986).

A muller made of metaquartzite was recovered from Trench 4 (see Figure 45, Lot 264). This small, oval-shaped stone exhibits three types of wear on multiple surfaces. Grinding is visible on the high-relief areas, and a light polish is discontinuously dispersed across the surfaces and sides of the tool. Light battering occurs on the ends and along one edge.

A small muller made of quartz arenite was recovered from Level 5 of Unit 8 (see Figure 45, Lot 346.1). The stone is roughly triangular in form, and grinding has produced three relatively flattened areas and one rounded surface. The wear is concentrated on the high-relief areas, and there are patches of polish. Peck marks are randomly distributed across the various surfaces.

The third muller is a small sublitharenite cobble recovered from Trench 2 (see Figure 45, Lot 262). It is roughly rectangular in overall form, and grinding has flattened three of the working surfaces and one end. Patches of polish occur on each surface. Peck marks are randomly distributed across all faces of the tool and the ends.

Two mano fragments were recovered. A medial fragment from a wedge-shaped mano (Figure 46, Lot 348.3) was recovered from Trench 4. This metaquartzite fragment exhibits ground areas on three surfaces. Microscopic examination of the working surface revealed that the areas of polish occur primarily on the curved surface, where heavy grinding has obliterated the interstices between the grains. The polish occurs on the high-relief grains, and the interstices between the grains are free of debris, smooth, and as shiny as the grains themselves. This type of wear results from friction against a softer material.

On the two flat surfaces, patches of grinding and polish are concentrated only on the high-relief areas. In the interstices between the grains, the scratches and cracks created by surface fatigue and abrasive wear have created a surface that is frosted in appearance. Peck marks (i.e., small random
indentations or dimples) are visible only on the flat surfaces, indicating an attempt to rejuvenate the surface in order to maintain grinding efficiency (see Adams 1988). The mixture of wear types exhibited on this stone suggests that it was a multipurpose food-processing tool used to process both relatively hard substance(s) and softer vegetal material(s).

The second mano fragment (see Figure 46, Lot 336.1) was recovered from Level 10 of Unit 6. The tool exhibits wear on multiple surfaces. It is planoconvex in profile and is made from a rather distinctive variety of silicified wood that has unusually large quartz crystals embedded in some layers. In some areas of both the flat working face and the upper more-convex surface, the large crystals are still clearly visible. In other areas, intensive grinding has leveled both the quartz crystals and the platy ridges along the high-relief areas. Polishing coats the flat plane surface and continues around the sides and one end, extending up onto portions of the convex side of the tool. The processes of surface fatigue and abrasive wear have produced a glossy polish across the high-relief areas; however, there is little microfracturing of the interstices between the grains. This suggests that the stone was primarily used to grind softer vegetal material, such as fresh corn kernels or fruits, or was used in tandem with a softer grinding platform, such as a basket (see Smith 1986). This type of sheen could also result from adding water during the grinding process (see Kraybill 1977).

Mano/Abrader

One mano/abrader fragment was recovered from Unit 7 (see Figure 46, Lot 352.1). The tool is made of quartz arenite and is missing portions of one end and one edge. It is rectangular in overall form and biplanar in cross section. Battered areas are concentrated on one surface and around the edges. Long, deep striations run the length of both surfaces. Grinding wear occurs on both plane surfaces, but is more heavily concentrated on one side. On this surface, heavy grinding has tapered one end, and microscopic examination of the ground area shows the high-relief grains to be flattened and opaque. Due to the scratches and cracks created by surface fatigue and abrasive wear, the surface has a frosted appearance. This suggests that whatever was being ground was relatively hard.

Mano/Hammerstones

Five mano/hammerstones were recovered: one from Trench 6 (Lot 265), one from Trench 10 (Lot 269.1), one from Trench 13 (Lot 271.1), and two from Unit 4 (lots 316.5 and 350.1). The wear noted on all five stones suggests they are multipurpose tools used in both grinding and pulverizing activities.

The tool recovered from Trench 6 is a half-moon-shaped stone made from sublitharenite (Figure 47, Lot 265). It is biconvex in profile, with one thinned edge and one flattened edge. The flattened edge has intensive grinding and exhibits distinct areas of polish that extend onto the mounded
surfaces. The peck marks randomly scattered across all three surfaces indicate rejuvenation of the tool during use. Battering occurs on the ends and around the thinned edge.

The tool recovered from Trench 10 is an irregular-shaped quartz arenite cobble that exhibits wear on multiple surfaces (see Figure 47, Lot 269.1). On the flat surface, grinding has leveled the grains and the interstices have been obliterated in areas. The scratches and cracks created by surface fatigue and abrasive wear give this face a frosted appearance. The highly irregular areas of the stone's mounded surface exhibit isolated patches of grinding and numerous pitted areas. Evidence of heavy battering occurs in several areas.

The mano/hammerstone (see Figure 47, Lot 271.1) recovered from Trench 13 is an irregular-shaped stone made from sublitharenite. Patches of grinding occur in two relatively flattened areas of the stone. Peck marks randomly distributed across the surfaces suggest rejuvenation of the tool. In several areas, heavy battering occurs, and numerous narrow grooves have been cut into the hard surface. This type of wear points to surface contacts that were hard-object-to-hard-object in nature.

Two mano/hammerstones were recovered from Unit 4, one from Level 8 (see Figure 47, Lot 316.5) and one from Level 10/11 (see Figure 47, Lot 350.1). The tool (Lot 316.5) recovered from Level 8 is a relatively square quartz arenite. It is thick, with one plane surface and one irregular, rounded surface. Old well-worn flake scars provide comfortable finger holds that make it easy to comfortably position the tool in the hand during use.

The grains in the high-relief areas of both surfaces exhibit grinding. The plane surface is lent a frosted appearance from the scratches and cracks created by surface fatigue and abrasive wear. Shallow, smoothed pits occur in areas, suggesting that pressure was applied in a crushing motion. On the opposite, more-rounded surface, grinding also occurs on the high-relief areas, but the pits are deeper and more consistent with pounding or battering. One relatively deep, smooth-sided pit appears to have been drilled into its surface. This could indicate that it was used to sharpen the end of an object such as a bone awl. In general, the wear patterns exhibited on this tool suggest that one side of the stone was used to crush and the other was used to pulverize.

The tool (Lot 350.1) recovered from Level 10/11 is a metaquartzite cobble that is more or less rectangular in overall form but is somewhat irregular in cross section. Wear appears on multiple areas of the stone. Battering occurs primarily on the ends, and there are a number of small pitted areas dotting the stone's surfaces. Ground and polished areas appear on numerous faces, but are most concentrated on one edge and one side of the stone. In these areas, the wear is concentrated on the high-relief areas and there is a slight polish to the grains. However, there is little microfracturing of the interstices between the grains, which suggests that this stone may have been used primarily to grind softer vegetal material, such as fresh corn kernels or fruits, or was used in tandem with a softer grinding platform, such as a basket (see Smith 1986). This type of sheen could also result from adding water during the grinding process (see Kraybill 1977).
Mano/Abrader/Hammerstone

A small chert cobbles (Figure 48, Lot 353.1) was recovered from levels (1/2) of Unit 8. This irregularly shaped tool exhibits five types of wear. Grinding has flattened one side of the tool, leveling the grains and obliterating the interstices in places. Scratches and cracks created by surface fatigue and abrasive wear give the surface a frosted appearance. The presence of peck marks indicates an attempt to rejuvenate the surface in order to maintain grinding efficiency (see Adams 1988). This wear pattern suggests that the substance(s) being ground was relatively hard. Battering is most heavily concentrated on one end, and there are numerous pitted areas dotting various areas of the tool. The most noticeable wear pattern is the presence of a series of deep, jagged grooves cut into the surface. On one face of the tool the grooves run horizontally, while on another they run vertically across the face. This type of wear results from the abrasive use of the stone to grind, smooth, shape, or sharpen a variety of implements, such as grinding the base of a projectile point. In general, the wear patterns noted on this small tool point to surface contacts that were hard-object-to-hard-object in nature.

Ground Stone Summary

Analyses of the 17 ground and battered stone tools recovered at 41LT387 identified a variety of tool types that had been used in a range of pounding and/or grinding operations. Most appear to be multipurpose tools, and their general morphology and associated wear patterns point to their use in a range of activities such as the processing of both hard and soft vegetal material and tool manufacturing and maintenance.

Ceramic Artifacts

Two undecorated body sherds were recovered from 41LT387 (Figure 49). One sherd (Lot 150) was recovered from Level 8 of Shovel Test 105, and the other (Lot 168) was recovered from Level 9 of Shovel Test 138.

Microscopic examination indicates that both sherds had nontempered very fine sandy pastes. The overall arrangement and orientation of the grains observed in the paste fabric of each sherd was fine in texture. The small, closely spaced irregularities observed across the face of the cross section were generally due to the presence of larger than average sand grains or carbonized pieces of vegetal material. Variation in color development suggests that both sherds represent vessels fired under variable firing conditions in an atmosphere containing insufficient or reduced amounts of oxygen. The interior of one sherd (Lot 150) had been smudged. This distinctive variant of open-air firing results from an extreme reducing atmosphere wherein carbon is deposited on the surface and in the pores of the vessel producing a dark gray to black finish (Ellis 1992, 1995; Hamilton 1988; Rice 1987:158; Shepard 1976:88-90).
Cross Section

Plane Surface

Lot 353.1
Both sherds were well made. Their exterior and interior surfaces had been floated, but left unburnished. Sherd thickness was relatively uniform and averaged 5.4 mm on one sherd (Lot 168) and 5.8 mm on the other (Lot 150).

The observed technological attributes on both sherds closely resemble the Bear Creek Plain types found in deep east Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf Coastal Plain sites (see Aten 1983; Ellis 1992, 1995, 2002; Jelks 1965; Story 1990). This suggests that the site may have had temporal and/or regional affiliations with prehistoric sites in the Big Cypress, Sabine, Neches, and Angelina river basins (see Perttula 2008) to the east-southeast or the Mossy Grove culture area to the south-southwest (see Story 1990).

DISCUSSION AND RECOMMENDATIONS

Site 41LT387 is thought to have resulted from multiple occupations during the Middle to Late Archaic and Late Prehistoric periods. Diagnostic artifacts include Neches River and Trinity dart points, a Perdiz arrow point, and two ceramic sherds. The Perdiz arrow point and the two ceramic sherds indicate the site was occupied during the Late Prehistoric period. Both the Neches River and the Trinity dart points date from the Middle to the Late Archaic (Turner and Hester 1999). Neches River dart points are common across East Texas, while Trinity dart points are common in the Dallas area and extend into east Texas. This observation suggests these two points likely represent separate occupations during this period.

Three subsite areas were identified during the current investigation based on the distribution of artifacts across the site. Assemblage variability between the subsite areas suggests their origins were also variable. Area 2 appears to have resulted more from tool use and maintenance, while areas 1 and 3 appear to have resulted more from core reduction and tool production. All of the ground stone artifacts recovered on-site came from Area 2, along with one dart point, one dart point tip, and both of the ceramic sherds. These observations suggest that (1) Area 2 resulted from multiple occupations during the Middle to Late Archaic and the Late Prehistoric periods, and (2) Area 2 resulted from a wider variety of activities than the other two subsite areas. Wear on the ground stone and flaked tool assemblages suggests both plants and animals were processed on-site.

The presence of fire-cracked rocks in all three subsite areas suggests further that subsistence resources were processed on-site with fire in all areas but was most intensive in Area 2, where six burned rock features were identified. Charred plant remains recovered from features 2, 4, and 5 indicate at least in part the processing of hickory nuts. However, the lack of identified cultural features in areas 1 and 3 and the paucity of preserved subsistence and/or spent fuel remains on-site indicates all three subsite areas lack significant data resources that would warrant NRHP inclusion. For these reasons, no further work is recommended at site 41LT387.
NRHP TESTING OF PREHISTORIC SITE 41LT397

NATURAL SETTING

Site 41LT397 is located on a toeslope (Figure 50) above Cox Creek. The main channel of the creek is about 200 m west of the site's center. Its elevation is about 371 ft msl. The soil on-site is Edge fine sandy loam, 1 to 5 percent slopes (Griffin 1997). The site is in a dense hardwood forest with a dense brushy understory. Ground surface visibility ranged between 0 and 15 percent due to the vegetation.

PREVIOUS INVESTIGATION

The site was initially located through shovel testing during previous intensive archeological survey (Sherman and Watkins 2007) when 19 shovel tests were excavated to determine the site's extent. Four shovel tests were culturally positive, yielding four pieces of silicified wood debitage, four pieces of chert debitage, one piece of metaquartzite debitage, and four fragments of fire-cracked rock. Artifacts were recovered from levels 1 (0 to 10 cmbs), 2 (10 to 20 cmbs), and 4 through 6 (30 to 60 cmbs). Based on the distribution of positive shovel tests and the shape of the landform, the site area was estimated to be approximately 70 m northwest-southeast by 30 m northeast-southwest.

WORK ACCOMPLISHED

Positional Control

A control grid was established using a hand-held compass and a 30-m tape. Pin flags were placed at 20-m grid intercepts. Shovel tests were excavated adjacent to the pin flags. The locations of all shovel tests, backhoe trenches, and the hand-excavated unit were captured with a Trimble GeoXT GPS.

Shovel Testing

Shovel testing was undertaken during two phases. Initially, 40 shovel tests were excavated at 20-m grid intercepts across the site. Of these shovel tests, 10 yielded lithic artifacts only, and 1 yielded both lithic artifacts and fire-cracked rocks. Subsequently, an additional 32 shovel tests were excavated at 10-m intervals around the 11 positive tests. Of these latter tests, 8 yielded lithic artifacts only, while 1 yielded only fire-cracked rocks.
Shovel testing during both phases yielded 33 lithic artifacts and 503.43 g of fire-cracked rocks (Figure 51). Between 1 and 5 lithic artifacts were recovered from each shovel test positive for lithic artifacts, with an average of 1.74 and a standard deviation of 1.28. Three shovel tests (23, 25, and 26) yielded lithic artifact totals above one standard deviation from the mean. Fire-cracked rocks were recovered from two shovel tests (2 and 60) but were concentrated in Shovel Test 2, from where 437.7 g of fire-cracked rocks was recovered. Lithic tools (two biface fragments) were recovered from shovel tests 23 and 30.

Shovel testing revealed the presence of a single artifact high density and diversity area defined by shovel tests 23, 25, 26, 30, 38, 49, 50, and 54 that extends roughly 40 m east-west by 25 m north-south. Both of the bifaces recovered through shovel testing, along with the vast majority of the fire-cracked rocks and one of only two lithic cores, were recovered from this area. Additionally, all three of the shovel tests that yielded debitage concentrations were excavated within this site area.

The vertical distribution of cultural materials recovered through shovel testing is presented in Table 39 below. Lithic artifacts were fairly evenly distributed throughout the vertical column but were somewhat concentrated in levels 2 and 3. The patterned vertical distribution of lithic artifacts is suggestive of artifact cycling, which may largely be attributable to floral and faunal turbation. Fire-cracked rocks were recovered from levels 4 and 5 from two shovel tests. The paucity of this material class on-site limits interpretation to general statements.

<table>
<thead>
<tr>
<th>10-cm Level</th>
<th>Lithic Artifacts</th>
<th>Percentage</th>
<th>Fire-cracked Rock (g)</th>
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<td>1</td>
<td>4</td>
<td>12.12</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>24.24</td>
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<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>4</td>
<td>12.12</td>
<td>65.73</td>
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<td>5</td>
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<td>3.03</td>
<td>437.70</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>12.12</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>6.06</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
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<td>3.03</td>
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</tr>
<tr>
<td>9</td>
<td>2</td>
<td>6.06</td>
<td>-</td>
</tr>
</tbody>
</table>

**Hand Excavation**

A single 1-x-1-m unit was excavated to sample the artifact high density and diversity area between shovel tests 2 and 23. This work yielded 18 pieces of nondiagnostic lithic debitage, 1 ground stone artifact, 1 unifacially modified flake, and 225.69 g of fire-cracked rocks. The vertical distribution of cultural materials recovered from Unit 1 are listed in Table 40. Unit 1 (Figure 52) was excavated to
Figure 51

SITE 41LT397
ARTIFACT DENSITY CLINES

- Positive Shovel Test
- Negative Shovel Test

ATKINS

Drawn by: C. Wallace
I 10YR 4/3 brown sandy loam, root mass
II 10YR 4/6 dark yellowish brown sandy loam
III 10YR 6/4 light yellowish brown sand
IV 10YR 6/6 light yellowish brown mottled with 5YR 4/6 yellowish red and 10YR 6/4 light yellowish brown sandy clay
8. NRHP Testing of Prehistoric Site 41LT397

an average depth of 65 cmbs. The A horizon was a 10YR 4/3 brown sandy loam that extended from the ground surface to an average depth of 12 cmbs. The E1 horizon extended from the base of the above to an average depth of 50 cmbs and was a 10YR 4/6 dark yellowish brown sandy loam. The E2 horizon extended from the base of the above to an average depth of 60 cmbs and was a 10YR 6/4 light yellowish brown sand. The Bt horizon extended from the base of the above to an unknown depth and was a 10YR 6/6 light yellowish brown mottled with a 5YR 4/6 yellowish red and 10YR 6/4 yellowish brown sandy clay.

Table 40: Site 41LT397, Unit 1, Vertical Distribution of Cultural Materials

<table>
<thead>
<tr>
<th>Level</th>
<th>Fire-Cracked</th>
<th>Ground Stone</th>
<th>Unifacially Modified Flake</th>
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</thead>
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<tr>
<td></td>
<td>Debitage</td>
<td>Rock</td>
<td>Stone</td>
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<tr>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
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<td>23.44</td>
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<td>7</td>
<td>1</td>
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</table>

Artifact Assemblage Analysis

Shovel testing resulted in the recovery of 33 lithic artifacts and 729.12 g fire-cracked rock. The fire-cracked rock assemblage was composed almost entirely of hematitic sandstone (n = 21). A single fragment of quartz arenite fire-cracked rock was also recovered. The fire-cracked rocks presumably were deposited as a result of subsistence processing. Fire-cracked rocks were relatively rare compared to the other prehistoric sites tested, and no evidence of intact cultural features was recovered. The lithic artifact assemblage includes 2 chipped stone tools, 31 nontools, and 1 ground stone tool.

Chipped Stone Artifacts

Two lithic tools were recovered, both of which (lots 7.1 and 16) are chert biface fragments. Both specimens were too fragmentary to assign to a reduction stage. Lot 7.1 is a medial fragment that apparently failed in a snap fracture at a material flaw. It retains no cortex and is well thinned across its entirety. Evidence of alternating beveling on the right sides is observed on the straight lateral edges. There is no evidence of utilization, suggesting abandonment upon breaking. Lot 7.1 weighs 0.33 g and measures 7.46 mm in length by 12.7 mm in width with a maximum thickness of 3.17 mm. Lot 16 is a proximal biface fragment that retains some cortex, has straight lateral edges, and is broken at a material flaw. There is no evidence of utilization, suggesting abandonment upon breaking. Lot 16 weighs 6.59 g and is 35.05 mm in length by 16.2 mm in width with a maximum thickness of 11.74.
Lot 36.1 is a unifacially modified chert flake fragment that exhibits intentional flaking along 8.67 mm on the straight lateral edge and also shows wear indicative of cutting activities on medium soft material. Its mass is 0.57 g and extends 12.54 mm in length by 14.1 mm in width with a maximum thickness of 2.88 mm.

The nontool assemblage includes 1 chert core, 1 silicified wood core, 5 complete chert flakes, 7 chert flake fragments, 1 quartz arenite flake fragment, 2 metaquartzite flake fragments, 11 broken chert flakes, 2 metaquartzite broken flakes, and 1 piece of chert debris. The tool assemblage consists of two chert biface fragments.

Table 41 provides a breakdown of the chipped stone artifacts by raw material type. Chert was the most common lithic raw material type used by the prehistoric occupants of site 41LT397 and accounts for nearly 82 percent of the lithic assemblage, including both of the tools. Slightly more than 12 percent of the lithic assemblage is metaquartzite. Quartz arenite and silicified wood are each represented by a single artifact. Both biface fragments, all of the complete flakes and debris, as well as 70 percent of the flake fragments and over 80 percent of the broken flakes are chert.

Table 41: Site 41LT397 Chipped Lithic Artifacts by Raw Material

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<th>Broken</th>
<th>Complete</th>
<th>Flake</th>
<th>Debris</th>
<th>Biface</th>
<th>Percentage</th>
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<td>Flake</td>
<td>Fragment</td>
<td>Debris</td>
<td>Fragment</td>
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<td>Chert</td>
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<td>11</td>
<td>5</td>
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<td>2</td>
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<tr>
<td>Metaquartzite</td>
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<td>-</td>
<td>2</td>
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<td>-</td>
<td>-</td>
<td>1</td>
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<tr>
<td>Silicified Wood</td>
<td>1</td>
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<tr>
<td>Total</td>
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<td>10</td>
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<td>39.39</td>
<td>15.15</td>
<td>30.30</td>
<td>3.03</td>
<td>6.06</td>
</tr>
</tbody>
</table>

**Ground Stone Tools**

One small, triangular-shaped muller (Figure 53, Lot 34.1) was recovered from Level 5 of Unit 1. This upper hand-held stone is easily manipulated and supplies pressure during the two primary mechanical operations of pounding and rubbing. Examination under 10x power binocular magnification revealed the presence of three types of wear: grinding, polishing, and battering.

The tool is 55.35 mm in length by 41.2 mm in width and 39.07 mm in thickness. A small portion of one edge is missing. Battering occurs along one side and on one end. Grinding and polish occur on all surfaces, but there is little microfracturing of the interstices between the grains. Surface fatigue and abrasive wear have produced a glossy polish across high-relief areas. This suggests that the stone may have been used primarily to grind softer vegetal material, such as fresh corn kernels or fruits, or was used in tandem with a softer grinding platform, such as a basket (see Smith 1986).
Figure 53
SITE 41LT397
GROUND STONE

Lot 34.1
Muller
This type of sheen could also result from the addition of water during the grinding process (see Kraybill 1977).

DISCUSSION AND RECOMMENDATIONS

Site 41LT397 is thought to have resulted from at least one short-duration occupation sometime during the Prehistoric period. The presence of lithic debitage suggests lithic tools were used, produced, or maintained on-site. The presence of fire-cracked rocks and ground stones suggests also that subsistence resources were processed on-site. However, due to the absence of preserved cultural features on-site, these conclusions remain unconfirmed. The absence of intact cultural features as well as preserved subsistence and/or spent fuel remains indicates the site lacks significant data resources that would warrant NRHP inclusion. For these reasons, no further work is recommended at site 41LT397.
NRHP TESTING AT PREHISTORIC SITE 41LT415

NATURAL SETTING

Site 41LT415 is located on the crest of a shoulderslope (Figure 54) above Cox Creek at an approximate elevation of 390 ft msl. The creek is roughly 100 m east. The site was originally located through shovel testing during previous intensive survey (Sherman and Watkins 2007). The soil on-site is Silawa fine sandy loam, 4 to 12 percent slope (Griffin 1997). Sandy loam extended to an average depth of approximately 80 cmbs. In seven of the shovel tests excavated during the initial visit to the site, a strong brown to reddish clay was encountered around 60 cmbs. The site's boundaries extend 120 m northeast-southwest by 60 m northwest-southeast. A gravel well pad road, heading north by northwest, is located about 100 m to the west of the site and a pipeline corridor runs east-west along the northern half of the site.

The vegetation consists of oak and elm trees with a dense brushy understory of greenbriar and yaupon. Ground surface visibility was about 5 percent over most of the site. Visibility along the grassy pipeline corridor ranged between 25 and 50 percent.

PREVIOUS INVESTIGATION

A total of 13 shovel tests were excavated when the site was originally recorded (Sherman and Watkins 2007) to define its limits. Four tests were culturally positive, yielding four pieces of nondiagnostic lithic debitage and one hematitic ground stone. Artifacts were recovered from levels 2 (10 to 20 cmbs), 3 (20 to 30 cmbs), 6 (50 to 60 cmbs), and 7 (60 to 70 cmbs). Based on the distribution of positive shovel tests and the shape of the landform, 41LT415 was estimated to extend 120 m northeast-southwest by 60 m northwest-southeast.

WORK ACCOMPLISHED

Positional Control

A 20-m grid was established using a hand-held compass and a 30-m tape. Pin flags were set at 20-m grid intercepts. Shovel test locations were captured with a Trimble™ Geo XT GPS device.
Figure 54
Site 41LT415
Plan Map

Prepared By: Atkins/19895
Job No.: 100016087
Date: March 8, 2011
File: N:\Clients\KL\Luminant\Kosse\100016087\geo\figs\41LT415.mxd

- Site Boundary
- 10ft Topographic Contour
- Positive Shovel Test
- Negative Shovel Test

0 20 Meters

ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST9, ST10, ST11, ST12, ST13, ST14, ST15, ST16

Pipeline Right-of-Way

ATKINS
Shovel Testing

During the current investigation, 12 shovel tests were excavated at a 20-m grid intercepts across the site. Only Shovel Test 1 contained cultural material, a Yarbrough dart point from Level 7 (60 to 70 cmbs). Four additional shovel tests were excavated at 10-m intervals around the positive test. All 4 of these tests were culturally sterile. No artifact high density and diversity areas were identified through shovel testing. For this reason no trenching or hand excavation was conducted.

Artifact Assemblage Analysis

The single artifact (Lot 6) recovered during testing is a complete metaquartzite Yarbrough dart point (Figure 55). It has a pointed distal tip, a slender triangular-shaped body, straight lateral edges with alternating beveling on the left side, indistinct shoulders, and an expanding stem with a rounded, slightly convex basal edge. Its mass is 5.49 g, and it extends 45.47 mm in length by 22.26 mm in width, with a maximum thickness of 8.15 mm. Yarbrough dart points date to the Archaic and are found in east central Texas (Perino 1968; Turner and Hester 1999).

DISCUSSION AND RECOMMENDATIONS

The small size and the ephemeral nature of the cultural deposits on-site suggest it resulted from a short-duration occupation. The presence of the Yarbrough dart point indicates at least one occupation during the Late Archaic to Late Prehistoric period. The absence of cultural features and subsistence remains as well as the low density of cultural materials on-site indicates that significant data resources that warrant NRHP inclusion are not present. For this reason, no further work is recommended at site 41LT415.
Lot 6
Yarbrough Dart Point

CENTIMETER
0 1 2 3 4 5

Figure 55
41LT415
YARBROUGH DART POINT
NRHP TESTING OF PREHISTORIC SITE 41LT422

NATURAL SETTING

Site 41LT422 is located on a toeslope above Cox Creek at an approximate elevation of 360 ft msl. Cox Creek lies approximately 200 m to the southwest. The soil on-site is Silawa fine sandy loam, 5 to 12 percent slopes (Griffin 1997). The soil is a deep yellowish brown sandy loam that extends more than 1 m in depth above sandy clay. Just prior to the initiation of NRHP testing, three bulldozed paths were cut along the site’s northern, southern, and eastern limits (Figure 56). Vegetation at the site included oak and elm trees and a dense yaupon and briar understory. The ground surface visibility was less than 10 percent due to leaf litter, except in the bulldozed areas where the ground surface was completely visible.

PREVIOUS INVESTIGATIONS

The site was initially located through shovel testing during previous intensive archeological survey (Sherman and Watkins 2007). Twelve shovel tests were excavated at that time to define the boundaries of the site. Four of those shovel tests were culturally positive and yielded eight pieces of nondiagnostic lithic debitage. Artifacts were recovered from levels 2 (10 to 20 cmbs) and levels 7–10 (60 to 100 cmbs). Based on the distribution of positive shovel tests, the site area was estimated to be 115 m northeast-southwest by 35 m northwest-southeast.

WORK ACCOMPLISHED

Positional Control

A control grid was established on-site using a 30-m tape and a hand-held compass. Pin flags were set at 20-m grid intercepts across the site, and an arbitrary datum was established at N200/E200. All shovel tests were tied to the grid using a Trimble GeoXT GPS. Data acquired with the GPS was downloaded and post-processed to achieve submeter accuracy.

Shovel Testing

Shovel testing was undertaken in two phases. During the first phase, 36 shovel tests were excavated at 20-m grid intercepts across the site, with some set slightly off grid to avoid dense vegetation, fallen trees, and areas impacted by heavy machinery. Twelve shovel tests were culturally positive,
each yielding between one and two artifacts or pieces of fire-cracked rock. Three of the shovel tests that yielded two artifacts or pieces of fire-cracked rock (20, 21, and 22) were adjacent to each other and suggested the possible presence of an artifact high density and diversity area.

During the second phase of shovel testing, eight additional shovel tests were excavated, of which three (37, 40, and 41) were culturally positive. Shovel tests 37 and 41 each yielded a single artifact, while Shovel Test 40 yielded four artifacts and a single piece of fire-cracked rock, making it the densest shovel test excavated on-site (Figure 57). However, due to the fact that the shovel tests closest to Shovel Test 40 each contained two or fewer artifacts, this part of the site was not considered an artifact high density and diversity area. No artifact high density and diversity areas were recognized as a result of shovel testing. For this reason, no hand excavation or mechanical trenching was conducted on-site.

Cultural materials were fairly evenly distributed throughout the vertical column, with slight concentrations in levels 7 and 8 (60 to 80 cmbs), from where just under 40 percent of the assemblage of cultural materials was recovered. Table 42 lists the vertical distribution of these materials.

<table>
<thead>
<tr>
<th>Level</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>4.17</td>
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<tr>
<td>2</td>
<td>2</td>
<td>8.33</td>
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<td>3</td>
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<td>1</td>
<td>4.17</td>
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<tr>
<td>6</td>
<td>3</td>
<td>12.50</td>
</tr>
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<td>7</td>
<td>4</td>
<td>16.67</td>
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<tr>
<td>8</td>
<td>6</td>
<td>25.00</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>12.50</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>

The patterned vertical distribution of cultural materials is thought to have arisen more through postdepositional artifact cycling, attributable to various sources of floral and faunal turbation, rather than aggradation of the landform harboring the site.
Figure 57

SITE 41LT422
ARTIFACT DENSITY CLINES

- Positive Shovel Test
- Negative Shovel Test
Artifact Assemblage Analysis

The prehistoric artifact assemblage consists of 24 prehistoric artifacts including 18 nontool lithics, 2 lithic tools (1 chipped and 1 ground), and 4 thermally altered rock fragments. The 4 thermally altered rocks include 2 hematitic sandstone fire-cracked rocks (78.75 g), 1 quartz arenite fire-cracked rock (10.14 g), and 1 hematitic sandstone burned rock (14.49 g).

The nontool lithic assemblage includes 17 pieces of unmodified debitage and 1 core. All nontool lithic artifacts were formed from locally available chert gravels. Four nontool lithic artifacts exhibited signs of thermal alteration of which three showed signs of intentional thermal alteration. The single lithic core recovered was exhausted and exhibited unidirectional negative percussion.

Lot 18 (Figure 58) is the lone chipped stone tool recovered. It is a medial metaquartzite biface fragment that failed in snap fractures due to material flaws. Due to the fragmentary nature of this specimen, it was not assigned to a reduction stage. It is well thinned across its entirety and lacks cortex. The straight lateral edges are heavily serrated. There is no evidence of utilization, suggesting abandonment upon failure. Its mass is 0.38 g, and it extends 12.34 mm in length by 8.75 mm in width, with a maximum thickness of 3.31 mm.

The second lithic tool is a silicified wood abrader fragment (Figure 58, Lot 8) that was recovered from Level 6 of Shovel Test 16. This irregular-shaped tool is 81.2 mm in length by 73.73 mm in width and 43.16 mm in thickness. Examination under 10x power binocular magnification revealed the presence of three types of wear: grinding, polishing, and grooves. Its wear patterns suggest that it may have been a hide-processing stone.

Grinding and polish occur on all surfaces, but there is little microfracturing of the interstices between the grains. The stone is missing large portions of its upper convex surface; however, the remnants of several ground and polished grooves are still visible. One end and the opposite relatively flat surface also exhibit grinding, but in these areas, the polish is much more lustrous and occurs on the high-relief grains, and the interstices between the grains are free of debris, smooth, and as lustrous as the grains themselves. Experimental evidence indicates that this wear pattern, when accompanied by a noticeably greasy sheen, is common on hide-processing stones due to adhesive and tribochemical wear processes that concentrate wear in the topographic lows as well as the high-relief grains (see Adams 1988, 1996). Further, we know from ethnographic evidence that nonflaked tools were frequently used to process hides. For example, the Apache used a sharp-edged stone to deflesh the hide. The hide was then stretched out to dry. If it was uneven, it was worked with a rough stone to smooth out the irregularities (Opler 1941). The Apache also used rough stones to rework or resoften prepared buckskin (Opler 1941), and the Comanche used nonflaked stones during brain tanning (Wallace and Hoebel 1952).
Lot 18
Medial Biface Fragment

Lot 8
Abrader Fragment

CENTIMETER
0 1 2 3 4 5

Figure 58
SITE 41LT422
ARTIFACTS

Drawn by: S. Laurence
DISCUSSION AND RECOMMENDATIONS

The presence of lithic debitage and tools suggests that the tools themselves were either produced, utilized, or retouched on-site sometime during the prehistoric period. The presence of both ground stones and fire-cracked rocks suggests further that subsistence processing occurred on-site. The absence of spent fuel remains or charred subsistence remains in the shovel testing assemblage, however, suggests interpretable intact cultural features have not been preserved on-site. The low density of cultural materials on-site indicates it resulted from a short-duration occupation. These finding suggest further that site 41LT422 does not harbor significant data that meets the criteria warranting NRHP inclusion. No further investigation is recommended.
NRHP TESTING OF HISTORIC SITE 41LT424

SETTING

Site 41LT424 is a surface/subsurface historic site located in a pasture on a broad shoulderslope at an approximate elevation of 438 ft msl (Figure 59). An unnamed tributary to Cox Creek is located 75 m to the northwest, while Cox Creek is 350 m to the southwest. The soil on-site is Edge fine sandy loam, 1 to 5 percent slopes (Griffin 1997). Shovel testing exposed brown to pale brown sandy loam generally extending from 5 to 80 cmbs in depth above a brownish yellow to strong brown sandy clay Bt horizon. The Bt horizon was encountered at the surface in shovel tests 7, 50, 52, and 58. The average depth to clay of positive shovel tests, where the Bt horizon was encountered, was slightly more than 30 cmbs. A large eroded area, where hematitic sandstone bedrock and Bt horizon clay is exposed, is located in the southwestern portion of the site. The eroded area is roughly 70 m north-south by 100 m east-west. A push pile and a depression are located near the center of the site. The depression is roughly 5.5 m in diameter and 0.6 m deep. The push pile is about 10 m to the north of the depression and is about 1.2 m high and 11 m in diameter.

A roughly 35-m-diameter outcrop of kaolinite occurs within the southwest portion of the eroded area. The kaolinite outcrops below a stratum of hematitic sandstone (Figure 60) roughly 95 m to the southwest of the site’s center. Two historic kilns dating to the mid to late nineteenth century (sites 41LT198, the Kimik Kiln, and 41LT11, the Johnson-Knox-Fowler Pottery Kiln) are located nearby, and their proximity to this outcrop of the main ingredient of potter’s clay strongly suggests local potters exploited this resource during the second half of the nineteenth century. For this reason, the outcrop of kaolinite and the entire eroded area are considered to be part of site 41LT424.

The site is in an open pasture and vegetated primarily with short grasses. Little to no vegetation is present within the eroded area. The pasture is spotted with cacti, mesquite, and blackberry. The ground surface was about 25 percent visible within the pasture.

PREVIOUS INVESTIGATIONS

Site 41LT424 was initially located during previous survey within the Kosse Mine (Sherman and Watkins 2007). During initial recordation, the site was subjected to a surface inspection. Within the pasture, a diffuse scatter of ceramic sherds, glass fragments, and unidentifiable metal artifacts was
Figure 59
Site 41LT424
Plan Map

Prepared By: 19995
Job No.: 100016087
Date: March 10, 2011

File: N:\Clients\KL\Luminant\Kosse\100016087\geo\figs\41LT424.mxd
Figure 60
SITE 41LT424
KAOLINITE OUTCROP
observed. None of the artifacts observed in the pasture were recovered. A large scatter of historic artifacts was also observed within the eroded area. A representative sample of the materials observed within the eroded area was recovered, consisting of 21 stoneware sherds, 5 ironstone sherds, 3 fragments of colorless glass, 1 fragment of purple glass, 1 fragment of olive green glass, 1 fragment of light purple glass, 1 fragment of light green glass, 2 fragments of light aqua glass, 1 fragment of deep aqua glass, 2 fragments of dark olive glass, 1 fragment of dark brown glass, 1 blue glass bottle, 3 snuff bottles, 1 cast iron plow fragment, 1 cast iron cog fragment, 1 manufactured brick, 1 indeterminate brass object, and 1.44 shotgun shell.

A total of 17 shovel tests were excavated to determine the horizontal and vertical extent of the subsurface artifact scatter. Of these, 8 were culturally positive, yielding 222 historic artifacts. Of these, 202 are glass or ceramic artifacts. The subsurface assemblage consisted of 40 stoneware sherds, 2 ironstone sherds, 2 whiteware sherds, 55 fragments of amber glass, 31 fragments of colorless glass, 29 fragments of light blue glass, 18 fragments of light amber glass, 15 fragments of aqua glass, 5 fragments of dark amber glass, 4 fragments of brown glass, and 1 fragment of light aqua opalescent glass; in addition, 3 unidentified nails, 2 cut nails, 2 unidentified iron fragments, 2 barbed wire fragments, 1 threaded bolt, 1 wire nail, 1 iron fastener, 1 iron fence staple, 6 rubber shoe sole fragments, and 1 piece of hematite that may have been fire cracked were recovered.

The vast majority of the artifacts recovered from site 41LT424 during its initial recordation came from Shovel Test 5, which was excavated adjacent to the deep depression. A concentration of barbed wire fragments, nail fragments, and unidentifiable metal fragments was observed in Shovel Test 5 but not collected. Levels 3 and 4 were almost completely composed of barbed wire bails. Shovel tests 1 and 8 excavated on top of the push pile contained a concentration of artifacts, though significantly fewer than Shovel Test 5. The very high concentration of artifacts in Shovel Test 5 suggests it was excavated within a trash pit.

**WORK ACCOMPLISHED**

Prior to NRHP testing, a small stand of oak and elm trees near the center of the site was cleared, and the entire site was mowed.

**Positional Control**

A 20-m control grid was established with a total station, and all shovel tests, trenches, and hand-excavated units were tied to the grid with the total station (see Figure 59). The control grid consisted of four adjoining blocks that comprised an area of roughly 7,360 m². The site datum was established at N500/E500. Grid intercepts were marked with wooden stakes. Along the site perimeter, where space would not allow for a 20-m intercept (for example adjacent the edge of the eroded area), 10-m intercepts were used. A 30-m tape was used to place 10-m grid intercepts within the grid established by the total station.
Shovel Testing

Shovel testing was conducted at 20-m grid intercepts across the site. Areas where this testing yielded high artifact density and/or diversity were subjected to intensive shovel testing at 10-m grid intercepts. A total of 61 shovel tests were excavated to determine the vertical and horizontal limits of the site. Of these shovel test, 21 were culturally positive yielding 98 artifacts consisting of 35 metal artifacts, 34 glass shards, 12 stoneware sherds, 3 ironstone sherds, 5 mortar fragments, 5 hand-made brick fragments, 2 Prosser buttons, and 2 faunal bone fragments. Shovel testing showed iron to be concentrated in a roughly 50 m north-south by 30 m east-west area located near the center of the site (Figure 61). Ceramic artifacts were also concentrated in the same general vicinity in an area that extended roughly 25 m north-south by 30 m east-west. Mortar was recovered from two shovel tests (10 and 12). Faunal remains were also recovered only from two shovel tests (12 and 30).

Magnetometer Survey

A magnetometer survey was conducted on-site 41LT424 on August 11, 2010. Based on the presence of what appears to be a mined outcrop of kaolinite, a ceramic assemblage dominated by stoneware similar to the wares present at the nearby kiln site 41LT11, and a previous owner who was associated with 41LT11, site 41LT424 is thought to be associated with a local ceramic industry. The magnetometer survey was conducted in an attempt to locate a ceramic kiln.

When a material containing magnetite (for example hearth rocks or clay) is heated, especially past the Curie point, many of the magnetic domains within the material realign and become oriented with magnetic north. In a magnetometer survey, this heated material (from hearths, pottery, bricks, kilns, etc.) will stand out against the surrounding unheated material whose magnetic domains are randomly oriented (Breiner 1999:46). It was predicted that if any portion of a historic kiln was present and intact at site 41LT424, it would be highly magnetic and readily detectable as a large dipolar anomaly with the negative pole north of the positive pole.

Atkins utilized a Geometrics, Inc. G-858 Magmapper with dual sensors configured. The G-858 automatically stored and output each sensor reading. This survey was conducted within the metric control (see Figure 59). The operator walked parallel north-south transects holding the sensors approximately 0.4 m above the ground. The sensors were mounted 1 m apart on a sensor staff, allowing for one transect to cover a 2-m-wide swath. In continuous mode, the G-858 recorded data at 0.10-second intervals using reference points marked at 20-m intervals. The readings and positions were stored sequentially with a time stamp.

At the completion of the magnetometer survey, the raw data was processed using MagMap2000 software to remove any spikes in the data. The processed data was then imported into a Microsoft® Excel spreadsheet containing a mathematical filter to remove diurnal fluctuations. Any total field value differing by greater than 0.5 nT from the average of either the preceding or following three
Figure 61
SITE 41LT424
ARTIFACT DENSITY CLINES

- Positive Shovel Test
○ Negative Shovel Test

Ceramic, contour interval = 0.5
Iron, contour interval = 0.5
Faunal, contour interval = 0.2
Mortar, contour interval = 0.5

Drawn by C. Wallace
recorded values was considered part of an anomaly. The difference between anomalous values and the ambient magnetic field was then substituted for the actual total-field value recorded by the magnetometer. Magnetic values not meeting this criterion were considered part of the magnetic background or ambient level. The difference between two adjacent readings (a number very close to zero) was substituted for the magnetic total-field readings in these cases. This algorithm results in a data set in which abnormally high and low magnetic values (anomalies) center around a zero background level. The resulting data set represents the magnetic total-field amplitude relative to the ambient magnetic field. When this method is employed, relatively long term trends in the magnetic data amplitude, such as those caused by diurnal variations or geologic gradients, are filtered out of the data set, leaving only local magnetic anomalies.

Following the application of the filter to remove any low-frequency diurnal variations, digital terrain-modeling software was used to map the data. The magnetometer data is illustrated as a contour map, a shaded-relief map, and as a grayscale image map (Figure 62). The contour map was created using Bentley’s GEOPAK® and depicts the anomalies as a series of color-coded contour lines. The data was contoured using a 5-nT interval with the red lines indicating positive total-field values exceeding the local (ambient) 0-nT amplitude of the earth’s magnetic field, and blue lines indicating negative amplitudes. The contour map allowed for the measurement of the peak amplitudes, inflection points, and declinations of the dipolar anomalies. The shaded relief and grayscale image maps were created using Surfer (Golden Software®) and are used to illustrate sitewide patterns of anomaly distribution.

A total of 30 dipolar anomalies were identified as being potentially associated with a historic feature such as a kiln or structural remains (Table 43). All but two of these anomalies were sampled through either hand excavation or mechanical excavation.

**Hand Excavation**

Two magnetic anomalies were sampled with one 1-x-1-m unit each. Anomaly 1 had the largest amplitude aside from the two anomalies associated with the depression (anomalies 12 and 13) and was therefore thought to have the highest potential to have been caused by the presence of a ceramic kiln. Anomaly 2 was a low-amplitude anomaly located in an area with limestone blocks on the surface surrounded by other low-amplitude anomalies and was thought to have the highest potential to be caused by a kiln-related structure. All sediment removed by hand excavation was screened using ¼-inch (0.635-cm)-mesh hardware cloth.
### Table 43. Site 41LT424 Dipolar Magnetic Anomalies

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Distance Between Poles</th>
<th>Declination</th>
<th>Amplitude (nT)</th>
<th>Associated Trench or Unit</th>
<th>Notes</th>
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<tbody>
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<td>1</td>
<td>1.18 m</td>
<td>1.2° east</td>
<td>-520/575</td>
<td>Unit 1</td>
<td>Feature 1</td>
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<td>2</td>
<td>0.61 m</td>
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<td>Feature 2</td>
</tr>
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<td>0.7 m</td>
<td>1° west</td>
<td>-190/295</td>
<td>Trench 14</td>
<td>Feature 2</td>
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</tr>
<tr>
<td>5</td>
<td>0.49 m</td>
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<td>-35/65</td>
<td>Trench 8</td>
<td>Feature 2</td>
</tr>
<tr>
<td>6</td>
<td>0.61 m</td>
<td>0°</td>
<td>-130/90</td>
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<td>7</td>
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<td>0.3° west</td>
<td>-190/135</td>
<td>Trench 6</td>
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<td>9</td>
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<td>0.4° east</td>
<td>-55/75</td>
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<td>10</td>
<td>0.64 m</td>
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<td>-150/165</td>
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<td>Feature 2</td>
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<td>-1070/2070</td>
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<td>Feature 3</td>
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<td>13</td>
<td>0.7 m</td>
<td>0°</td>
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<td>15</td>
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<td>0.8° east</td>
<td>-160/110</td>
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<tr>
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<td>-105/180</td>
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<tr>
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<tr>
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</tr>
<tr>
<td>22</td>
<td>0.8 m</td>
<td>0.2° east</td>
<td>-140/40</td>
<td>Trench 16</td>
<td>Feature 3</td>
</tr>
<tr>
<td>23</td>
<td>0.93 m</td>
<td>1.6° east</td>
<td>-35/90</td>
<td>Trench 17</td>
<td>Feature 3</td>
</tr>
<tr>
<td>24</td>
<td>0.71 m</td>
<td>5.4° west</td>
<td>-125/50</td>
<td>Trench 24</td>
<td>Feature 3</td>
</tr>
<tr>
<td>25</td>
<td>0.61 m</td>
<td>1° west</td>
<td>-45/40</td>
<td>Trench 25</td>
<td>Feature 3</td>
</tr>
<tr>
<td>26</td>
<td>0.62 m</td>
<td>0.8° east</td>
<td>-50/55</td>
<td>Trench 26</td>
<td>Feature 3</td>
</tr>
<tr>
<td>27</td>
<td>0.91 m</td>
<td>1.5° east</td>
<td>-475/380</td>
<td>Trench 27</td>
<td>Feature 3</td>
</tr>
<tr>
<td>28</td>
<td>1.1 m</td>
<td>66.8° east</td>
<td>-235/220</td>
<td>Trench 31</td>
<td>Feature 3</td>
</tr>
<tr>
<td>29</td>
<td>1.67 m</td>
<td>37.3° west</td>
<td>-330/290</td>
<td>Trench 32</td>
<td>Feature 3</td>
</tr>
<tr>
<td>30</td>
<td>1.32 m</td>
<td>46.7° west</td>
<td>-125-375</td>
<td>Not Tested</td>
<td>Modern baling wire on surface</td>
</tr>
</tbody>
</table>

**Unit 1, Feature 1, Anomaly 1**

Unit 1 was a 1-x-1-m unit excavated to determine the source of Anomaly 1 and was centered over the inflection point of the anomaly. The unit was excavated to a depth of 120 cmbs. Excavation revealed Feature 1, the remains of a deep trash pit dug into the clay Bt horizon, extending to a depth of roughly 115 cmbs. A profile of the south wall is provided on Figure 63. The artifacts recovered from Unit 1 are listed in Table 44.
Anomaly

I

10YR 6/6 dark brownish yellow silty clay, thinly bedded, clear wavy boundary, no mottles, blocky angular, medium, strong, firm

II

10YR 4/3 brown fine sandy loam, thickly bedded, clear boundary, no mottles, blocky subangular, fine, moderate, friable

III

10YR 5/6 yellowish brown sandy loam, medium bedded, clear broken boundary, no mottles, blocky subangular, medium, weak, friable, some charcoal flecks and chunks

IV

10YR 5/4 yellowish brown mottled with 10YR 5/2 dark grayish brown sandy loam, medium bedded, clear wavy boundary, many faint mottles, blocky subangular, medium, moderate, firm, some charcoal flecks and chunks

V

10YR 5/4 yellowish brown sandy loam mottled with 10YR 6/2 light brownish gray, 10YR 8/1 white, and 7.5YR 5/8 strong brown clay, thickly bedded, clear smooth boundary, many coarse distinct mottles, blocky subangular, medium, moderate, firm, many charcoal flecks and chunks

VI

10YR 6/6 brownish yellow sandy loam mottled with 10YR 8/1 white clay, thickly bedded, abrupt smooth boundary, many distinct medium mottles, blocky subangular, medium, moderate, firm

VII

10YR 8/1 white clay mottled with 5YR 5/8 yellowish red clay, unknown boundary, many coarse prominent mottles, blocky subangular, medium, strong, firm
Table 44. Site 41LT424 Unit 1 Cultural Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass Watch Gear</td>
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<td></td>
</tr>
<tr>
<td>Brass Rivet</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Handmade Brick</td>
<td>–</td>
<td>35.37</td>
</tr>
<tr>
<td>Machine-made Brick</td>
<td>–</td>
<td>9.39</td>
</tr>
<tr>
<td>Prehistoric Ceramic</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Copper Battery Post</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Faunal Remains</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Bottle Glass</td>
<td>269</td>
<td></td>
</tr>
<tr>
<td>Chimney Lamp Glass</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Snuff Bottle Glass</td>
<td>68</td>
<td></td>
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<tr>
<td>Vessel Glass</td>
<td>158</td>
<td></td>
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<td>Window Glass</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Wire</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Barbed Wire</td>
<td>304</td>
<td></td>
</tr>
<tr>
<td>Fence Staple</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Fork</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Horse Bit</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron, Indeterminate</td>
<td>256</td>
<td></td>
</tr>
<tr>
<td>Cut Nail</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Wire Nail</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Ironstone</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Melted Lead</td>
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<td></td>
</tr>
<tr>
<td>Mortar</td>
<td>–</td>
<td>15.15</td>
</tr>
<tr>
<td>Plastic Comb</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Porcelain</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Thermally Altered Quartz Arenite</td>
<td>–</td>
<td>238.38</td>
</tr>
<tr>
<td>Stoneware</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Beneath a thin stratum of displaced 10YR 6/6 brownish yellow silty clay, Unit 1 contained several strata of disturbed sediment that appear to represent two distinct deposits. The uppermost deposit, Zone A (approximately 8 to 55 cmbs) consisted of a 10YR 4/3 brown fine sandy loam overlying and truncating a 10YR 5/6 yellowish brown sandy loam, which overlays a 10YR 5/4 yellowish brown sandy loam mottled with 10YR 5/2 dark grayish brown sandy loam. Zone A was marked by a dense concentration of barbed wire and chicken wire between 30 and 45 cmbs along with numerous snuff bottles and snuff bottle fragments. The lower deposit, Zone B (approximately 55 and 115 cmbs), consisted of a 10YR 5/4 yellowish brown sandy loam mottled with 10YR 6/2 light brownish gray, 10YR 8/1 white, and 7.5YR 5/8 strong brown clay overlying a 10YR 6/6 brownish yellow sandy loam mottled with 10YR 8/1 white clay. The clay Bt horizon was found below Zone B and rose to form a shelf in the northeastern portion of Unit 1 at approximately 70 cmbs. Zone B was
marked by a decreased artifact density, the replacement of barbed wire and chicken wire with nails as the most common metal artifact, the relative absence of snuff bottle fragments, and the presence of 22 burned artifacts. Several burned hematitic sandstone and limestone cobbles were found at the bottom of Zone B. While charcoal flecks and chunks were found from 20 to 110 cmbs, they were most densely concentrated in Zone B, between approximately 65 and 100 cmbs.

No temporal distinction was drawn between the artifacts recovered from zones A and B. The differential deposition may be the result of two depositional episodes spaced close in time, and/or the deposit of material from two locations on the property, possibly from separate land-clearing episodes.

Unit 2, Feature 2, Anomaly 2

Unit 2 was a 1-x-1-m unit excavated to identify the source of Anomaly 2. Excavation showed Anomaly 2 to be associated with Feature 2, a small push pile. The unit was centered over the positive pole of Anomaly 2, at the top of a slight rise amidst several large, irregularly shaped limestone blocks, and was excavated to a depth of 58 cmbs. A profile of the north wall is provided on Figure 64. The artifacts recovered from Unit 2 are listed in Table 45.

Excavations in Unit 2 revealed that Feature 2 represents the remains of a small push pile composed mostly of a dense collection of limestone blocks and cobbles. Intermixed with the limestone, within a 10YR 5/3 brown sandy loam, were a collection of historic artifacts and hematitic sandstone blocks and cobbles. The concentration of limestone terminated at approximately 43 cmbs. A dense concentration of mortar fragments was located at and immediately below this transition. The sediment at the bottom of Feature 2, from approximately 43 to 48 cmbs, consisted of pockets of 10YR 5/3 brown sandy loam, 10YR 4/4 dark yellowish brown sandy loam, and 10YR 7/4 very pale brown sandy loam. Below the feature fill, at approximately 48 cmbs, the sediment transitioned to a 7.5YR 5/6 strong brown clay mottled with 2.5YR 4/6 red clay.

The mass of the rocks excavated from Unit 2 is presented by level in Table 46. Approximately 70 to 75 percent of the rocks comprising Feature 2 was limestone, while the remaining were hematitic sandstone. Approximately 25 percent of the stones within Feature 2 appeared to have been burned. The burned rocks were found intermixed with unburned rocks, suggesting secondary deposition of these materials. The positions of the rocks did not indicate any clear pattern or orientation, and the artifacts found amongst them did not reveal any temporal or functional trends.
I  10YR 5/3 brown sandy loam, thickly bedded, clear wavy boundary, no mottles, blocky angular, moderate, firm
II  10YR 4/4 dark yellowish brown sandy loam, thinly bedded, clear broken boundary, no mottles, blocky subangular, fine, very friable
III  10YR 7/4 very pale brown sandy loam, thinly bedded, clear wavy boundary, no mottles, blocky subangular, medium, moderate, firm
III  7.5YR 5/6 strong brown clay mottled with 2.5YR 4/6 red clay, unknown boundary, many distinct mottles, blocky subangular, medium, strong, firm

Limestone
Hematitic Sandstone

Figure 64
SITE 41LT424
FEATURE 2, UNIT 2
NORTH WALL PROFILE

Drawn by S. Laurence
Table 45. Site 41LT424 Unit 2 Cultural Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass Pencil Rear Tube</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Brass Washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Handmade Brick</td>
<td>–</td>
<td>748.59</td>
</tr>
<tr>
<td>Machine-made Brick</td>
<td>–</td>
<td>100.39</td>
</tr>
<tr>
<td>Burned Clay</td>
<td>–</td>
<td>3.2</td>
</tr>
<tr>
<td>Faunal Remains</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Bottle Glass</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Chimney Lamp Glass</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Vessel Glass</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Window Glass</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Barbed Wire</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron Buckle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fence Staple</td>
<td>3</td>
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<tr>
<td>Iron, Indeterminate</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Insulator Screw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cut Nail</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Wire Nail</td>
<td>4</td>
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<td></td>
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<tr>
<td>Lead Shot</td>
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<td></td>
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<tr>
<td>Mortar</td>
<td>–</td>
<td>869.49</td>
</tr>
<tr>
<td>Porcelain Insulator</td>
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<td></td>
</tr>
<tr>
<td>Porcelain</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Semiporcelain</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Shell Button</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Stoneware</td>
<td>3</td>
<td></td>
</tr>
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Table 46: Site 41LT424, Unit 2, Rock Mass by Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.75</td>
</tr>
<tr>
<td>2</td>
<td>32.25</td>
</tr>
<tr>
<td>3</td>
<td>71</td>
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<tr>
<td>4</td>
<td>34.29</td>
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<tr>
<td>5</td>
<td>23.5</td>
</tr>
<tr>
<td>Total</td>
<td>177.75</td>
</tr>
</tbody>
</table>
Mechanical Excavation

A backhoe with a smooth blade affixed to the bucket was used to excavate 31 (see Figure 59) backhoe trenches on-site 41LT424 to sample magnetic anomalies and to prospect for features. The trenches were excavated until the top of the Bt horizon was encountered. After excavation, the walls of each trench were troweled smooth in an effort to identify cultural features. Three historic features were identified as a result of this work.

A representative sample of the cultural materials observed in each trench was documented and photographed. Artifacts with the potential to yield additional information through analysis were recovered.

**Trench 1, Feature 3, Anomaly 12**

Feature 3 was expressed on the surface by a deep depression, approximately 5.5 m in diameter and 0.6 m deep. Trench 1 was excavated to sample the depression and associated large magnetic anomaly (Anomaly 12). Trench 1 was excavated across the lowest point in the depression and was approximately 5 m long and 1.2 m wide. It was excavated to a maximum depth of 120 cmbs. The south wall was exposed to a maximum depth of 128 cmbs during wall cleaning. The clay Bt horizon was observed at approximately 124 cmbs at the center of the pit, sloping up to 40 cm at the eastern edge and 70 cm at the western edge of the depression. A profile of the south wall is provided on Figure 65.

Feature 3 represents the remains of a deep trash pit dug approximately 115 cm into the clay Bt horizon. The feature fill consisted of five distinct depositional zones. The lowest was a 10YR 8/3 very pale brown sandy clay, overlain by a stratum of loose 10YR 6/6 brownish yellow sandy loam, partially overlain by a stratum of loose 10YR 5/6 yellowish brown sandy loam mottled with 2.5YR 5.8 yellowish red clay, overlain by a stratum of loose 10YR 6/4 light yellowish brown sandy loam. The surface stratum was a loose 10YR 5/3 brown sandy loam. Many artifacts were observed throughout Feature 3, though there were several pockets containing higher artifact concentrations.

A representative sample of the artifacts observed in Trench 1 was recorded. These materials are listed in Table 47.

Excavation of Trench 1 confirmed that Feature 3 represents the remains of a large trash pit. This feature contained a wide array of artifact types including numerous large artifacts such as a pair of leaf springs. Much like Feature 1, Feature 3 appears to be composed of several distinct deposits, likely resulting from distinct depositional events spaced close in time and/or the deposit of materials from different locations on the property, possibly from separate land-clearing episodes.
I 10YR 5/3 brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, many small roots
II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain
III 10YR 5/6 yellowish brown sandy loam mottled with 2.5YR 5/8 yellowish red clay, thinly bedded, clear and broken boundary, few fine faint mottles
IV 10YR 6/6 brownish yellow sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, some roots, concentration of cultural materials
V 10YR 8/3 very pale brown sandy clay, medium bedded, clear and broken boundary, no mottles, granular, fine, friable
VI 10YR 7/3 pale brown sandy clay mottled with 2.5YR 6/8 and 10YR 6/8 brownish yellow clay, many coarse distinct mottles, blocky subangular, coarse

**Hematitic Sandstone**

**Artifact Concentration**

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**Figure 65**

**SITE 41LT424**

**FEATURE 3, ANOMALY 12, TRENCH 1**

**SOUTH WALL PROFILE**

Drawn by: S. Laurence
Table 47: Site 41LT424, Trench 1, Representative Artifacts

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;CA Benton&quot; Machine-made Brick</td>
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</tr>
<tr>
<td>&quot;Groesbeck&quot; Machine-made Brick</td>
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</tr>
<tr>
<td>Faunal Remains</td>
<td>13</td>
</tr>
<tr>
<td>Snuff Bottle</td>
<td>5</td>
</tr>
<tr>
<td>Glass</td>
<td>28</td>
</tr>
<tr>
<td>Ironstone</td>
<td>5</td>
</tr>
<tr>
<td>Stoneware</td>
<td>11</td>
</tr>
<tr>
<td>Semiporcelain</td>
<td>2</td>
</tr>
<tr>
<td>Porcelain Doll Arm</td>
<td>1</td>
</tr>
<tr>
<td>Iron Harness</td>
<td>1</td>
</tr>
<tr>
<td>Iron Tractor Wrench</td>
<td>1</td>
</tr>
<tr>
<td>Iron, Indeterminate</td>
<td>10</td>
</tr>
<tr>
<td>Spring Leaf Suspension</td>
<td>2</td>
</tr>
<tr>
<td>Coil Spring</td>
<td>2</td>
</tr>
<tr>
<td>Tin Bowl</td>
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<td>Tin Cup</td>
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<tr>
<td>Axle</td>
<td>1</td>
</tr>
<tr>
<td>Iron Wheel</td>
<td>2</td>
</tr>
<tr>
<td>Plow Share</td>
<td>1</td>
</tr>
<tr>
<td>Plow Sweep</td>
<td>1</td>
</tr>
<tr>
<td>Metal Handle</td>
<td>1</td>
</tr>
<tr>
<td>Tobacco Tin</td>
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</tr>
<tr>
<td>Concrete Disk</td>
<td>2</td>
</tr>
</tbody>
</table>

Trench 2, Feature 4, Anomaly 7

Feature 4 was expressed on the surface by a mound approximately 11 m in diameter and 1.2 m high. Trench 2 was excavated to sample the mound and identify the source of an associated magnetic anomaly (Anomaly 7). Trench 2 was placed across the highest point of the mound and was approximately 4.7 m long and 1.2 m wide. It was excavated to a maximum depth of 120 cmbs, approximately 10 cm below the surrounding ground surface. The east wall was exposed to a maximum depth of 130 cmbs during wall cleaning. A profile of the east wall is provided on Figure 66.

Feature 4 represents the remains of a large push pile. The feature sediment consists of three distinct depositional zones overlaying an undisturbed 10YR 7/3 very pale brown sandy loam. The lowest feature stratum was a 10YR 5/4 yellow brown fine sandy loam. This stratum was overlain by a stratum of 10YR 6/3 pale brown fine sandy loam with many large rodent disturbances. The surface stratum was a 10YR 6/4 light yellowish brown fine sandy loam. Artifacts were observed...
10YR 6/4 light yellowish brown fine sandy loam, medium bedded, gradual wavy boundary, no mottles, single grain

10YR 6/3 pale brown mottled with (A) 10YR 4/3 brown and (B) 10YR 5/4 yellowish brown fine sandy loam, thickly bedded, clear, irregular boundary, few coarse distinct mottles, single grain

10YR 5/4 yellowish brown fine sandy loam, thickly bedded, clear smooth boundary, no mottles, single grain

10YR 7/3 very pale brown sandy loam, unknown boundary, single grain
throughout Feature 4 without any noticeable concentrations. Feature 4 contained significantly fewer and smaller artifacts than Feature 3 and likely represents the backdirt pile from the original excavation of the pit at Feature 3.

The representative sample of artifacts recorded from Trench 2 consisted of 1 machine-made brick fragment impressed with a five-point star, 1 plow share fragment, 1 iron handle fragment, 1 iron bolt, 1 iron ring, 1 tin bucket fragment, 1 wheel or barrel fragment, 9 stoneware sherds, 3 ironstone sherds, 3 porcelain sherds, 2 snuff bottle fragments, 7 glass shards, and 2 faunal fragments.

**Trench 3**

Trench 3 was excavated to identify the source of Anomaly 11 and was approximately 3.7 m long and 1.2 m wide. It was excavated to an average depth of approximately 45 cmbs, where the clay Bt horizon was exposed. Two small fragments of modern baling wire were found on the surface at the location of the positive peak of the magnetic anomaly and represent the anomaly's source. A fragment of an unmarked machine-made brick was observed within the trench. A profile of the east wall is provided on Figure D-1 in Appendix D.

**Trench 4**

Trench 4 was excavated to identify the source of Anomaly 10 and was approximately 3.7 m long and 1.2 m wide. It was excavated to an average depth of approximately 35 cmbs, where the clay Bt horizon was exposed. No cultural features were identified within Trench 4. A profile of the east wall is provided on Figure D-2 in Appendix D. The source of Anomaly 10 was not identified.

**Trench 5**

Trench 5 was excavated to identify the source of Anomaly 9 and was approximately 3.7 m long by 1.5 m wide. It was excavated to an average depth of approximately 48 cmbs, where the clay Bt horizon was exposed. Two unidentified metal fragments were located within the trench at approximately 35 cmbs and represent the source of the anomaly. A profile of the east wall is provided on Figure D-3 in Appendix D.

**Trench 6**

Trench 6 was excavated to identify the source of Anomaly 8 and was approximately 3.9 m long by 1.9 m wide. It was excavated to an average depth of approximately 44 cmbs where the clay Bt horizon was exposed. A profile of the south wall is provided on Figure D-4 in Appendix D. The representative sample of artifacts recorded from Trench 6 consisted of 1 machine-made brick fragment, 1 glass shard, 6 stoneware sherds, 3 ironstone sherds, 1 indeterminate metal fragment, and 1 faunal bone fragment. A collection of disarticulated burned limestone was observed between 25 and 35 cmbs. The metal object located within this trench represents the source of the anomaly.
**Trench 7**

Trench 7 was excavated to identify the source of Anomaly 6 and was approximately 4.4 m long by 1.7 m wide. It was excavated to a maximum depth of 120 cmbs where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-5 in Appendix D. The representative sample of artifacts recorded from Trench 7 consisted of 1 tangle of barbed wire, 4 indeterminate flat iron fragments, 1 tin bucket fragment, 1 cut nail, 3 machine-made “CA Benton” brick fragments, 2 unmarked machine-made brick fragments, 3 snuff bottle fragments, 6 glass shards, 11 ironstone sherds, and 8 stoneware sherds. The metal objects located within this trench represent the source of the anomaly.

**Trench 8**

Trench 8 was excavated to identify the source of Anomaly 5 and was approximately 3.5 m long by 1.6 m wide. It was excavated to an average depth of approximately 36 cmbs, where the clay Bt horizon was exposed. Two 10-cm-long iron bolts were located within the trench and represent the source of the anomaly. One of the bolts had a square head, while the other had a round head. A profile of the east wall is provided on Figure D-6 in Appendix D.

**Trench 9**

Trench 9 was excavated to prospect for features adjacent to an apparent row of limestone blocks and was approximately 2.8 m long by 1.5 m wide. It was excavated to an average depth of approximately 46 cmbs where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-7 in Appendix D. The representative sample of artifacts recorded from Trench 9 consisted of three ironstone sherds, four machine-made “CA Benton” brick fragments, and two unmarked machine-made brick fragments. The bricks were found disarticulated and intermixed with the limestone blocks and possible mortar fragments to approximately 10 cmbs.

**Trench 10**

Trench 10 was excavated to identify the source of Anomaly 4 and was approximately 4 m long by 1.5 m wide. It was excavated to an average depth of about 60 cmbs, where the clay Bt horizon was exposed. Trench 10 was excavated approximately 1 m east of Unit 2. While limestone and mortar fragments were found in this trench, the quantity was significantly less than that found in Unit 2, suggesting, that Feature 2 does not extend to Trench 10. A profile of the west wall is provided on Figure D-8 in Appendix D. The representative sample of artifacts recorded from Trench 10 consisted of four machine-made brick fragments stamped with a five-point star, five “CA Benton” machine-made brick fragments, five unmarked machine-made brick fragments, one iron rod, and three ironstone sherds. The machine-made bricks were distributed from 1 to 10 cmbs, and the limestone and mortar fragments were distributed from 1 to 35 cmbs. The metal object located within this trench represents the source of the anomaly.
Trench 11

Trench 11 was excavated to identify the source of Anomaly 28 and was approximately 4 m long by 1.4 m wide. It was excavated to an average depth of about 22 cmbs, where the clay Bt horizon was exposed. A profile of the west wall is provided on Figure D-9 in Appendix D. The representative sample of artifacts recorded from Trench 11 consisted of one ironstone sherd, one glass shard, and one indeterminate iron fragment. The metal object located within this trench represents the source of the anomaly.

Trench 12

Trench 12 was excavated to identify the source of Anomaly 20 and was approximately 3.7 m long by 1.5 m wide. It was excavated to an average depth of about 25 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-10 in Appendix D. The representative sample of artifacts recorded from Trench 12 consisted of one ironstone sherd, seven glass shards, and one cut nail. The metal object located within this trench represents the source of the anomaly.

Trench 13

Trench 13 was excavated to identify the source of Anomaly 27 and was approximately 3.1 m long by 0.9 m wide. It was excavated to an average depth of 20 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-11 in Appendix D. The representative sample of artifacts recorded from Trench 13 consisted of 18 tin roof fragments, 2 plow share fragments, 1 iron pulley plate, 1 iron strap, 1 indeterminate iron fragment, 1 machine-made brick fragment, 2 ironstone sherds, and 1 indeterminate glass shard. The tin roof fragments were identified on the ground surface and just below the surface. The metal objects located on the surface and within this trench represent the source of the anomaly.

Trench 14

Trench 14 was excavated to identify the source of Anomaly 3 and was approximately 2.4 m long by 2 m wide. It was excavated to an average depth of 16 cmbs where the clay Bt horizon was exposed. A profile of the west wall is provided on Figure D-12 in Appendix D. The representative sample of artifacts recorded from Trench 14 consisted of one plow moldboard, three snuff bottle fragments, and three ironstone fragments. The metal object located within this trench represents the source of the anomaly.

Trench 15

Trench 15 was excavated to identify the source of Anomaly 21 and was approximately 3.8 m long by 1.4 m wide. It was excavated to an average depth of 67 cmbs, where the clay Bt horizon was exposed. A profile of the west wall is provided on Figure D-13 in Appendix D. The representative
sample of artifacts recorded from Trench 15 consisted of 47 faunal bone fragments, 1 plow share fragment, 2 iron plates, 3 iron bars, 2 iron rods, 1 nail, 1 brass harmonica reed, 2 machine-made brick fragments, 1 shell button, 1 brass .22 rimfire cartridge case, 24 ironstone sherds, 16 stoneware sherds, 13 glass shards, and 8 snuff bottle fragments. The metal objects located within this trench represent the source of the anomaly.

Though there was a high density of artifacts observed in this trench, they were not considered to be part of a feature. The artifacts were widely distributed throughout the trench, and there was no evidence of a feature outline within Trench 15.

**Trench 16**

Trench 16 was excavated to identify the source of Anomaly 22 and was approximately 3.8 m long by 1.6 m wide. It was excavated to an average depth of 28 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-14 in Appendix D. The representative sample of artifacts recorded from Trench 16 consisted of one iron disk fragment, one indeterminate iron fragment, four ironstone sherds, one stoneware butter churn lid fragment, and two glass shards. The metal objects recovered from this trench were located approximately 1 cmbs and represent the source of the anomaly.

**Trench 17**

Trench 17 was excavated to identify the source of Anomaly 23 and was approximately 2.7 m long by 1.2 m wide. It was excavated to an average depth of 22 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-15 in Appendix D. The representative sample of artifacts recorded from Trench 17 consisted of one iron tree harness fragment, two indeterminate iron fragments, one machine-made brick fragment, and one stoneware sherd. The metal objects recovered from this trench represent the source of the anomaly.

**Trench 18**

Trench 18 was excavated to identify the source of Anomaly 16 and was approximately 3.8 m long by 1.6 m wide. It was excavated to an average depth of 31 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-16 in Appendix D. The representative sample of artifacts recorded from Trench 18 consisted of one cast iron stove fragment (probable door), four indeterminate iron objects (probable plow or cultivator parts), two stoneware sherds, and one glass shard. The metal objects recovered from this trench represent the source of the anomaly.

**Trench 19**

Trench 19 was excavated to identify the source of Anomaly 19 and was approximately 2.8 m long by 2.2 m wide. It was excavated to an average depth of 35 cmbs, where the clay Bt horizon was exposed.
exposed. No cultural features were identified within Trench 19; however, a coil of modern baling wire was located on the surface nearby. A profile of the east wall is provided on Figure D-17 in Appendix D.

**Trench 20**

Trench 20 was excavated to identify the source of Anomaly 18 and was approximately 3.1 m long by 1.8 m wide. It was excavated to an average depth of 38 cmbs, where the clay Bt horizon was exposed. No cultural features were identified within Trench 20. A profile of the east wall is provided on Figure D-18 in Appendix D. The source of Anomaly 20 was not identified.

**Trench 21**

Trench 21 was excavated to identify the source of Anomaly 13 and was approximately 4.1 m long by 1.3 m wide. It was excavated to an average depth of 47 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-19 in Appendix D. The representative sample of artifacts recorded from Trench 21 consisted of six stoneware sherds, one semiporcelain sherd, one ironstone sherd, six glass shards, and one large iron object (possible rail or track). The metal object recovered from this trench represents the source of the anomaly.

**Trench 22, Feature 5, Anomaly 14**

Trench 22 was excavated to identify the source of Anomaly 14 and was approximately 5.5 m long by 1.7 m wide. It was excavated to an average depth of 68 cmbs where the clay Bt horizon was exposed. Feature 5, a trash pit, was identified at the conformation of the E and Bt soil horizons. The backhoe was used to excavate the portion of the feature exposed in the trench to afford a profile view in the west wall of the trench (Figure 67). In profile, the feature was shown to extend to a maximum depth of 114 cmbs.

Excavation of Trench 22 showed Feature 5 to be the remains of a shallow trash pit dug approximately 46 cm into the clay Bt horizon. At the top of the Bt horizon, the exposed portion of the trash pit extended approximately 1 m north to south and 1.2 m east to west. The center of this feature was located approximately 30 cm south of the inflection point of Anomaly 14. The feature fill consisted of four sediment types. The bottom of the feature was filled with a 10YR 6/6 brownish yellow clay mottled with 2.5YR 5/8 yellowish red and 10YR 7/1 gray. This stratum was overlaid with a 10YR 5/8 yellowish brown sandy clay that was truncated by a 10YR 6/4 light yellowish brown sandy loam, which was partially overlain by a 10YR 7/3 very pale brown sandy clay mottled with 2.5YR 5/8 yellowish red sandy clay. Artifacts occurred throughout the feature mixed with hematitic sandstone blocks; the majority of the artifacts came from the clay-dominated fill at the bottom of the feature.
10YR 6/3 pale brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain

10YR 5/4 yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain

10YR 7/3 very pale brown mottled with 2.5YR 5/8 yellowish red sandy clay, thinly bedded, clear broken boundary, granular, firm, friable

10YR 6/4 light yellowish brown sandy loam, medium bedded, clear broken boundary, no mottles, single grain

10YR 5/8 yellowish brown sandy clay, medium bedded, clear broken boundary, no mottles, granular, fine, friable

10YR 6/6 brownish yellow mottled with 2.5YR 5/8 yellowish red and 10YR 7/1 light gray clay, unknown boundary, many coarse prominent mottles, blocky angular, coarse, firm
The representative sample of artifacts recorded from Trench 22 consisted of 1 plow share fragment, 1 plow chisel, 1 plow sweep, 1 indeterminate plow fragment, 2 cast iron stove legs, 1 indeterminate cast iron stove fragment, 1 cast iron pot fragment, 2 iron pipe fragments, 4 indeterminate iron objects or fragments, 17 stoneware sherds, 9 ironstone sherds, 7 glass shards, and 1 brass balloon-head centerfire cartridge case.

Feature 5 was filled with artifacts from a mix of functional groups suggesting that it represents a general domestic dump, much like features 1 and 3, only smaller.

**Trench 23**

Trench 23 was excavated to identify the source of Anomaly 15 and was approximately 3.8 m long by 2.2 m wide. It was excavated to an average depth of 38 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-20 in Appendix D. The representative sample of artifacts recorded from Trench 23 consisted of one unidentified metal object (possibly representing seat frame from a truck), two barbed wire fragments, five nails, eight stoneware sherds, one porcelain sherd, six ironstone sherds, and two glass shards. The metal "frame" was located approximately 20 cmbs and represents the primary source of the anomaly.

**Trench 24**

Trench 24 was excavated to identify the source of Anomaly 24 and was approximately 4.4 m long by 2 m wide. It was excavated to an average depth of 35 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-21 in Appendix D. The representative sample of artifacts recorded from Trench 24 consisted of one iron rod, one iron ring, five ironstone sherds, and one glass shard. The metal objects came from approximately 30 cmbs and represent the source of the anomaly.

**Trench 25**

Trench 25 was excavated to identify the source of Anomaly 25 and was approximately 4.1 m long by 2.4 m wide. It was excavated to an average depth of 33 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-22 in Appendix D. The representative sample of artifacts recorded from Trench 25 consisted of one iron rod fragment and seven barbed wire fragments. These materials were recovered from approximately 10 cmbs and represent the source of the anomaly.

**Trench 26**

Trench 26 was excavated to identify the source of Anomaly 26 and was approximately 3.6 m long by 2 m wide. It was excavated to an average depth of 39 cmbs, where the clay Bt horizon was exposed. A profile of the west wall is provided on Figure D-23 in Appendix D. The representative sample of artifacts recorded from Trench 26 consisted of one machine-made brick fragment, two
barbed wire fragments, one iron bolt, three indeterminate iron fragments, one porcelain sherd, two ironstone sherds, four stoneware sherds, six glass shards, one glass jar lid liner fragment, and two faunal fragments. The metal objects recovered from this trench represent the source of the anomaly.

**Trench 27**

Trench 27 was excavated to prospect for features west of Feature 2/Unit 2 and was approximately 5.6 m long by 1.5 m wide. It was excavated to an average depth of 26 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-24 in Appendix D. The representative sample of artifacts recorded from Trench 27 consisted of four machine-made brick fragments stamped with "CA Benton," one unmarked machine-made brick fragment, one ironstone sherd, and four glass shards.

Trench 27 was excavated approximately 50 cm west of Unit 2 (oriented north-south). While fragments of limestone were found in the top 20 cm of sediment within this trench, the quantity was significantly less than that found in Unit 2, suggesting that Feature 2 does not extend to Trench 27.

**Trench 28**

Trench 28 was excavated to prospect for features west of Feature 2/Unit 2 and was approximately 6 m long by 1 m wide. It was excavated to an average depth of 24 cmbs, where the clay Bt horizon was exposed. A profile of the east wall is provided on Figure D-25 in Appendix D. A possible layer of lime was observed at the interface between the A horizon and the Bt horizon.

**Trench 29, Feature 1**

Trench 29 was excavated in an attempt to define the limits of Feature 1 and was approximately 3.6 m long by 1 m wide. It was excavated to an average depth of approximately 90 cmbs, where the clay Bt horizon was exposed. A profile of the south wall is provided on Figure 68. The representative sample of artifacts recorded from Trench 28 consisted of 1 indeterminate brass object, 1 iron hoe blade, 1 cast iron toy train, 3 nails, 2 wire fragments, 1 iron hinge fragment, 1 front axle, 5 indeterminate iron objects or fragments, 1 machine-made brick fragment, 63 porcelain or ironstone sherds, 3 stoneware sherds, 20 glass shards, and 2 glass jar lid liner fragments.

Trench 29 was excavated approximately 1 m south of Unit 1 (oriented east-west). Feature 1 was exposed along the length of Trench 29 to a depth of approximately 90 cmbs, approximately 30 cm shallower than the depth of the feature in Unit 1. Fewer artifacts were observed in Trench 29 than in Unit 1, and no barbed wire or chicken wire was found within this trench. Based on the observed artifacts and soil, the remains of Feature 1 within Trench 29 appear to correspond to Zone B.
IOYR 4/3 brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, small and medium roots

IOYR 5/4 yellowish brown sandy loam, medium bedded, broken boundary, no mottles, single grain, charcoal flecks, roots

IOYR 5/8 yellowish brown mottled with 5YR 5/8 yellowish red and IOYR 8/1 white clay, unknown boundary, many coarse distinct mottles, blocky, coarse, roots
identified within Unit 1 (see Figure 63). The presence of Feature 1 along this trench indicates that the feature continues to extend farther south, terminating between this trench and Trench 14 (see Figure 59).

**Trench 30**

Trench 30 was excavated in an effort to identify the limits of Feature 1 and was approximately 2.8 m long by 1.2 m wide. It was excavated to an average depth of 33 cmbs, where the clay Bt horizon was exposed. A profile of the south wall is provided on Figure D-26 in Appendix D. Trench 30 was excavated approximately 1 m north of Unit 1 (oriented east-west). No artifacts or trace of Feature 1 were located within Trench 30. The absence of Feature 1 within this trench indicates that the northern boundary of this feature lies between Unit 1 and Trench 30 (see Figure 59).

**Trench 31**

Trench 31 was excavated to identify the source of Anomaly 29 and was approximately 3.8 m long by 1.6 m wide. It was excavated to an average depth of 20 cmbs, where the clay Bt horizon was exposed. No cultural features were identified within Trench 31. A profile of the east wall is provided on Figure D-27 in Appendix D. The source of Anomaly 31 was not identified.

**Artifact Assemblage Analysis**

This section presents a description and analysis of the artifacts recovered from site 41LT424 during NRHP testing investigations. In summary, 2,071 specimens and samples were collected during archeological excavations. Of these, a total of 1,937 specimens were identified as artifacts, while 134 were considered ecofacts. The majority of the artifacts (n = 1,933; 98 percent) are associated with the nineteenth-century and early-twentieth-century occupation of the site. The remaining artifacts consist of prehistoric ceramic sherds (n = 4; less than 1 percent) and a number of artifacts of unidentified temporal affiliation, such as stone and clay (n = 20; less than 1 percent). Artifacts unassociated with a particular era are believed to date to the historic occupation of the site due to context. Therefore, these specimens are discussed with the other historic artifacts, while the prehistoric artifacts are discussed at the beginning of this section.

A total of 134 specimens recovered from site 41LT424 are classified as ecofacts. All of these are believed to date to the historic occupation. These include food residue (n = 124; 93 percent), such as faunal bone fragments and eggshells, and charcoal samples (n = 10; 7 percent).

**Prehistoric Artifacts**

Four small body sherds and two fragments of burned clay were recovered from 41LT424. The burned clay fragments (Lot 58.23) were recovered from Level 4 of Unit 2, and the four sherds (Lot 53.1) were recovered from Level 2 of Unit 1.
All four sherds had fresh breaks and were determined to be from the same vessel. Microscopic examination indicates that the conjoined sherd was from a vessel made from a nontempered very fine sandy clay. The overall arrangement and orientation of the grains observed in the paste fabric was fine in texture. Variation in color development suggests that the conjoined sherds represent a vessel fired under relatively variable firing conditions in an atmosphere containing reduced amounts of oxygen. Its exterior and interior surfaces were too weathered to determine its original surface finish. The sherd is relatively thin, but is too fragmented to obtain an accurate thickness measurement.

Based on observed technological attributes, the sherd closely resemble the Bear Creek Plain types found in deep East Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf Coastal Plain sites (see Aten 1983; Ellis 1992, 1995, 2002; Jelks 1965; Story 1990). This suggests that the prehistoric component at site 41LT424 may have had temporal and/or regional affiliations with prehistoric sites in the Big Cypress, Sabine, Neches, and Angelina river basins (see Perttula 2008) to the east-southeast or the Mossy Grove culture area to the south-southwest (see Story 1990). The presence of a small number of prehistoric ceramic sherds indicates ephemeral prehistoric activity at the site. Thus, there appears to have been no significant prehistoric occupation of site 41LT424.

**Historic Artifacts**

A total of 1,933 historic artifacts were recovered from site 41LT424. These artifacts were categorized by function and placed in 10 functional groups. Table 48 presents the functional groups and the total number of artifacts assigned to each group. The historic artifact assemblage is discussed within the framework of these artifact groups. When possible, contextual interpretations concerning how the material remains may have been used are offered. A representative sample of the temporally diagnostic artifacts recovered from site 41LT424 is presented on Figure 69. A representative sample of other artifacts recovered is presented on Figure 70.

**Activities (n = 5, less than 1 percent)**

The Activities Group includes items that may have been utilized by multiple occupants at the site during various pursuits. This group consists of a total of five recovered artifacts and two artifacts that were recorded but not collected. The seven specimens fall within three artifact classes composed of musical instruments, writing implements, and tools. Recovered activities-related artifacts include one jaw harp, one harmonica reed, one pencil rear tube, one tractor wrench, and one unidentified tool handle. Observed artifacts include a pulley plate and a bucket. No specimens within this group exhibited evidence of thermal alteration.

**Musical Instruments**

A jaw harp is a musical instrument that consists of a flexible metal tongue attached to a frame. The tongue is placed in the performer’s mouth and plucked with the finger to produce a note. A single
A harmonica consists of a plastic or metal housing and multiple reeds. A single brass harmonica reed was identified at site 41LT424. Harmonicas and other similar instruments were developed in the early nineteenth century and are therefore not temporally sensitive.
70.26 Medicine Bottle Neck with Patent Finish
70.25 Medicine Bottle Neck with Double Ring Finish

70.19 Bottle Base

62.1 Bristol Glaze Stoneware Butter churn Lid with Impressed Capacity Mark

58.22 Two-hole Dish Shell Button
75.12 Two-hole Disc Shell Button
50.1 Two-hole Oval Eye Prosser Button
44.1 Four-hole Piecrust Prosser Button

76.1 Bristol Glaze with Cobalt
73.2 Spongeware

75.7 Balloon-head Cartridge Case
61.14 .22 Rim-fire Case
56.11 Lead Shot

CENTIMETER

0 1 2 3 4 5

ATKINS

Figure 70
SITE 41LT424
REPRESENTATIVE ARTIFACTS

Drawn by: S. Laurence
Writing Implements

A pencil rear tube is a brass tube by which an eraser is attached to a wooden pencil. The first United States patent for a pencil with combined eraser was issued in 1858 to Hymen Lipman (U.S. Patent No. 19,783). The rear tube fragment collected from site 41LT424 resembles a modern pencil tube and most likely dates to the twentieth century.

Tools

Tractor wrenches were furnished by manufacturers for mechanical use on their tractor equipment. The nearly complete tractor wrench recovered from site 41LT424 is “S-shaped” of cast ferrous metal. The artifact was corroded, and no manufacturer information could be identified. Tractor wrenches most likely date to after the invention of reliable, internal-combustion engines during the early twentieth century.

One other tool collected from the site consists of a ferrous metal handle with a contoured grip. The diagnostic end of the tool is missing, and the function of the tool is unknown. This artifact is not temporally indicative.

Two tools observed at the site include a pulley plate and a tin bucket. The pulley plate consisted of a cast ferrous alloy mount used to house the drum of a pulley. The bucket was constructed of ferrous metal plated with tin alloy. These items may date from the nineteenth century or twentieth century; therefore they are not considered temporally diagnostic.

Summary

The artifacts assigned to the Activities Group are consistent with a domestic occupation dating from the nineteenth century and extending into the early twentieth century. The jaw harp and harmonica are associated with leisure-time activities, while the pencil tube suggests writing or drawing related to correspondence, schooling, or similar undertakings. Tools recovered from the site imply general activities including maintenance and repair related to small machinery.

Agriculture (n = 337, 17 percent)

The Agriculture Group includes items pertaining to animal husbandry and farming. Collected objects relating to animal husbandry at site 41LT424 include 1 iron bit fragment, 1 iron harness, 18 iron staples, and 305 fragments of iron barbed wire. Collected objects related to farming include 12 fragments of iron wire. No collected specimens within this group exhibited evidence of burning. In addition, more than 15 items related to the Agriculture Group were observed but not collected at the site. These include numerous barbed wire fragments, numerous chicken wire fragments, and 1 fragment of a tree harness within the animal husbandry subcategory. Items observed relating to farming include 2 axle fragments, 2 spring leaf suspension fragments, numerous wire fragments, 1
hoe fragment, 2 iron wheel fragments, more than 8 plow fragments, and 1 fragment of a barrel strap.

**Animal Husbandry**

The bit fragment consists of a curved mouthpiece and one intact cheek or shank. Bits are pieces of horse tack used within the bridle. The identified fragment is known as a curb bit, which is used for Western-style equestrian activities. The harness consists of two iron terrets attached to an iron support for a saddle pad placed around the girth of a draft animal, such as a horse, and would have been used to guide the reins from the bridle to an operator behind the horse. Harnesses allow a horse, donkey, mule, etc. to pull various animal-drawn vehicles, such as wagons, carriages, or plows. The ferrous metal tree harness identified at the site consists of one arm with a swivel guide. It would have been used to distribute the load of an animal-driven vehicle between two draft animals. The 18 staples are all fence staples, and the 305 collected barbed wire pieces and numerous observed pieces are all the modern type, consisting of two twisted wires and four prongs. Barbed wire in conjunction with fence staples and observed chicken wire indicates the presence of fencing. The predominant use for any type of fencing would have been for agricultural purposes, such as the containment of livestock, as suggested by the presence of chicken wire. Barbed wire was first sold in Texas in 1875 and quickly became a predominant type of fencing. The other items have long periods of production during the nineteenth and twentieth centuries and are not considered temporally diagnostic.

**Farming**

Fragments of iron wire are assumed to represent various agricultural activities including baling hay. Wire recovered and observed from site 41LT424 was fragmentary and consisted of narrow gauges or rusted iron alloy. Observed farming artifacts at the site include two spring leaf suspension fragments, two ferrous metal axle fragments, and two ferrous metal wheel fragments, which could have been parts of wagons or carts used during agricultural pursuits. Farming tools include more than eight observed pieces of animal-drawn plow parts, such as one mold board, one chisel, one sweep, three shares, and other fragments. A manual agricultural tool was also observed in the form of a ferrous metal hoe fragment. A single fragment of barrel strapping was identified, which likely would have been used for agricultural storage.

**Summary**

While the Agriculture artifact assemblage is not particularly temporally sensitive, the use contexts of the artifacts are consistent with a late-nineteenth- to early-twentieth-century farmstead occupation. The Agriculture artifacts, such as the horse bit, harness, fence staples, barbed wire, baling wire, and other observed artifacts, all might have been used in animal husbandry and farming activities during that time period.
Architecture \( (n = 464, 24 \text{ percent}) \)

The Architecture Group includes structural materials (brick, mortar, window glass, limestone blocks, hematitic sandstone blocks, and metal roofing), construction hardware (nails, bolts, and washers), and interior finishing items (electric insulators). No specimens within this group exhibited evidence of burning.

Structural Materials

Bricks: The 73 brick fragments recovered from site 41LT424 include handmade and machine-made varieties. Handmade brick fragments total 40 specimens (5,578.95 g), and range in color from red \((n = 2)\), reddish brown \((n = 18)\), reddish yellow \((n = 14)\), to pink \((n = 6)\). Machine-made brick fragments total 33 specimens (3,680.78 g), and range in color from light reddish brown \((n = 9)\), red \((n = 21)\) to reddish yellow \((n = 3)\). No surface treatments were observed on brick specimens, and no evidence of burning was recorded.

A total of three collected machine-made brick fragments retained impressed makers’ marks; these are a representative sample the marked bricks observed at 41LT424. Lot 70.54 was impressed with the letters “GROES...,” which represents Groesbeck. Bricks stamped with Groesbeck were manufactured by the Groesbeck Brick Company located in Limestone County after 1916 (Steinbomer 1982). Lot 71.4 was impressed with a five-point star. This mark was used by the Texas Press Brick Company of Ferris, Texas, in Ellis County from 1909 to 1926 (Steinbomer 1982). The third impressed brick (Lot 74.5) reads “CA BENTON.” This mark is attributed to the Corsicana Brick Company of Navarro County Texas from 1912 to 1934 (Steinbomer 1982).

Mortar: Mortar recovered from the site consists of a soft, white, sandy paste. A total of 215 specimens were collected, totaling 910.82 g. All recovered mortar was highly fragmented and displayed no evidence of burning.

Window Glass: Window glass belongs to the structural materials subcategory of the Architecture Group. A total of 14 flat glass shards representing window pane fragments were recovered. Nine aqua-tint shards and 5 colorless shards were recovered from site 41LT424. Recovery of flat glass less than 3.2 mm in width suggests that at least one structure at the site contained paned windows.

Cut Blocks: Numerous hematitic sandstone blocks and limestone blocks were observed at the site. These blocks exhibited cut and tool marks indicating they had been intentionally shaped. These blocks were complete, fragmentary, and varied in dimensions. About 25 percent of the observed cut stone blocks exhibited evidence of burning.

Metal Roofing: Numerous ferrous metal sheets plated with tin were observed at the site. It is likely that these sheets represent portions of roofs to structures such as sheds or porches.
Construction Hardware

Nails: A total of 156 nail fragments were assigned to the Construction Hardware subcategory of the Architecture Group. Nails recovered from site 41LT424 were fragmentary and heavily rusted, which prohibited identification of any characteristics other than basic manufacturing techniques. Cut nails \( (n = 106) \) are the most prevalent, while wire nails \( (n = 50) \) represent roughly one-third of the assemblage.

Miscellaneous: A single brass washer was recovered from the site, which is assumed to represent a portion of the architectural component. Three ferrous metal bolts were also observed at the site. These items were presumably utilized in architectural contexts. Washers and bolts are not considered temporally diagnostic and could date to either the historic or modern era.

Interior Finishing Items

Electric insulators are considered interior finishing items to varying types of structures. Four fragments of a single porcelain knob insulator in addition to the insulator screw were recovered from site 41LT424. Knob insulators were used for electrical wiring within buildings. Before 1935, only 2.3 percent of rural Texas had access to electricity from a generating plant. However, the Emergency Relief Act of 1935 provided funding for electrification, and by 1965 only 2 percent of Texas farms remained without electricity (Davis 2011). It is likely that the electric insulator dates from sometime after 1935.

Summary

Temporally diagnostic architectural remains at site 41LT424 have production date ranges that span from 1790 to the present. The predominance of handmade bricks as well as marked bricks produced as late as 1934 indicates significant building activities prior to the turn of the nineteenth century, with improvements, repairs, or additions into the first half of the twentieth century (Steinbomer 1982). Also, nails recovered from the site are mostly cut, suggesting construction activities were initiated prior to circa 1900 (Edwards and Wells 1993). The presence of a single insulator suggests the electrification of at least one structure at the site, which most likely occurred after 1935 but before 1965. The Architecture Group suggests building activities began prior to 1900 and most likely continued into at least the first half of the twentieth century.

Arms \( (n = 4, \text{ less than 1 percent}) \)

The Arms Group includes artifacts involved with the utilization and/or production of munitions. Artifacts assigned to the Arms Group include two cartridge cases, one projectile, and one fragment of manufacturing residue. No specimens within this group exhibited evidence of burning.
Cartridge Cases

Cartridge cases recovered from site 41LT424 consist of rimfire (n = 1) and centerfire (n = 1) cases. The single rimfire case is a spent .22 caliber short cartridge made of brass. Rimfire .22 caliber cases have been in production since 1857; however, a headstamp of a diamond dates from 1898 to 1935. This type of mark was used by the Western Cartridge Company founded in 1898, until its merger with the Winchester Repeating Arms Company in 1935 (Barnes 2000). The single centerfire case is a spent .41 caliber cartridge made of brass. The case is a folded, balloon-head type, which was produced between 1868 and circa 1900 (Barnes 2000). No headstamp is present on the centerfire cartridge.

Projectiles

The only type of projectile recovered from the site is a single piece of lead shot. The intact pellet is 3.95 mm in diameter and has a mass of 0.36 g, which is consistent with size 1 birdshot. This type of shot became obsolete sometime around the turn of the century and was no longer offered in the Sears and Roebuck Catalog of 1903 (Sears 1969).

Manufacturing Debris

Manufacturing debris related to personal production of lead bullets or pellets includes melted lead, sprue, or slag. Evidence of bullet production at site 41LT424 is limited to the recovery of one fragment of melted lead, which is not temporally indicative.

Summary

While the Arms Group artifacts recovered from the site suggest production ranges between 1868 to 1935, it is likely that significant time passed between the date of production, purchase, use, and discard. These materials conceivably were deposited at 41LT424 during the period from the mid-nineteenth century into the first half of the twentieth century.

Clothing (n = 6, less than 1 percent)

Artifacts attributed to the Clothing Group include clothing fasteners, such as buttons, rivets, and buckles. Two button fragments and two complete buttons (representing four buttons), one rivet, and one buckle were recovered from site 41LT424. No specimens within this group exhibited evidence of burning.

Buttons

Button materials include Prosser (n = 2) and shell (n = 2). Prosser buttons include a four-hole piecrust button with a lustrous sheen, and a two-hole oval-eyed button. Shell button fragments exhibited a two-hole fish-eye design and a two-hole dish shape. Shell and Prosser buttons were
traditionally used on inexpensive dresses and underwear, and remained popular until the advent of Bakelite around 1909 (Pool 1991). Button sizes are within 12 to 16 linges, which is considered small and consistent with use on shirts, dresses, and underwear.

**Rivets**

A single clothing rivet was recovered from the site. It consisted of a copper alloy head and post. Rivets are traditionally used to reinforce the seams on work clothes, such as jeans or overalls. Rivets were first patented in this fashion by Jacob Davis and Levi Strauss in 1873 (U.S. Patent No. 139,121). Rivets continue to be used in this function.

**Buckles**

The single buckle recovered from site 41LT424 is ferrous alloy in composition. The buckle consists of a cast rectangular frame and single bar with a wire tongue attached to the center. The buckle was attributed to the Clothing Group due to its size and likely association with work clothes.

**Summary**

Artifacts attributed to the Clothing Group predominantly date from the mid-nineteenth century through the early twentieth century. Although some items, such as rivets and buckles, are still commonly used today, it is likely they also date to this time period. Thus, the majority of items associated with the Clothing Group point to use beginning prior to 1909.

**Household (n = 11, less than 1 percent)**

This group includes items that are commonly found within a domicile and are considered to have been utilized by multiple occupants at the site. Artifacts recovered belonging to the Household Group at site 41LT424 include furniture parts, lighting items, batteries, and domestic accessories. No specimens within this group exhibited evidence of burning.

**Furniture**

In addition to various cast iron stove parts observed at the site, two cast iron legs were collected, which likely represent a portion of a wood-burning stove. The legs exhibit a decorative curvature with embossed scrolling designs. Cast iron wood-burning stoves were commonly used during the nineteenth century and early twentieth century and remain in use today.

A single ferrous metal handle, possibly plated with nickel or tin, was also observed at the site. It is composed of two lugs and a stationary bail, which would have functioned as a pull for an item such as a drawer.
Lighting Items

Lighting items recovered from the site consist of glass chimney lamp fragments. A total of seven colorless shards were recovered, one of which consists of a chimney base with a beaded edge. All chimney lamp glass is presumably associated with kerosene lanterns, which required drafting in order to burn. Kerosene lanterns were most common between 1860 and 1880 (Spillman 1983).

Batteries

A single copper battery post with copper wire wrapped around the stem was identified at the site. Since the commercial success of modern batteries following their invention in 1887 (Gassner 1887), batteries have been a common source of electricity for many households.

Domestic Accessory

A single part from internal clockworks was recovered from the site. The thin brass plate is circular with a central hole from which a small rectangular notch is cut. This artifact is not considered temporally diagnostic due to the long production period of mechanical clocks.

Summary

Overall, few household items were recovered at site 41LT424. The presence of lantern glass and stove fragments provide evidence for a primary domestic occupation during the late nineteenth century and twentieth century. The rest of the household assemblage, while not temporally indicative, suggests a small domestic occupation.

Kitchen (n = 727, 37 percent)

The Kitchen Group includes subcategories of artifacts related to food preparation, storage, and consumption. These artifacts include ceramic vessel fragments, glass container fragments, and metal utensils. A total of 36 specimens within this group exhibited evidence of burning.

Ceramics

A total of 153 ceramic sherds belonging to the Kitchen Group were recovered. The ware types present include ironstone (n = 68), semiporcelain (n = 10), porcelain (n = 8), and stoneware (n = 67). These specimens represent vessels designed for use as tableware and storageware. Decoration is evident on 38 sherds, and 8 sherds have makers' marks. Although some sherds lack decoration, it is possible that they represent blank portions of decorated vessels. Four ceramic sherds exhibited evidence of burning.

Refined Earthenware and Porcelain: Ironstone sherds occur with the greatest frequency at site 41LT424. Of the 68 recovered sherds, 54 are undecorated, 14 are decorated, and 7 are marked.
Decorative techniques include decalcomania and molding (n = 3), decalcomania/molding/gilding (n = 1), hand-painting (n = 1), molding (n = 8), and spongeware (n = 1). Multiple vessel forms are represented, such as fragments of cups (n = 10), lids (n = 3), pestles (n = 6), and indeterminate tableware types (n = 10). Flatware is represented by fragments of plates (n = 7) and indeterminate tableware types. The remaining 37 sherds could not be confidently assigned to either vessel category or form. Ironstone sherds from these vessel categories comprised 16 rim sherds, 2 rim/body and base sherds, 6 rim/body sherds, 30 body sherds, 11 base sherds, 1 handle sherd, and 2 lid sherds.

Semiporcelain sherds are the third most frequently occurring type at the site. Of the 10 semiporcelain sherds recovered, 7 are decorated and 3 are undecorated. Decorative techniques include decalcomania (n = 1), decalcomania/molding (n = 3), and molding (n = 3). Semiporcelain hollowware vessel forms include fragments of bowls (n = 3), cups (n = 1), lids (n = 1), and indeterminate tableware forms (n = 1). Flatware vessel forms include indeterminate tableware forms. The remaining 3 sherds could not be definitely assigned to either vessel category or form. The vessel categories are represented by ceramic sherds from various vessel parts, such as rims (n = 6), bodies (n = 3), and bases (n = 1).

Eight porcelain sherds are within the Kitchen Group ceramic assemblage. This ware type accounts for the lowest amount of ceramic sherds recovered from site 41LT424. Decorated porcelain sherds (n = 4) include decalcomania (n = 1), gilded (n = 1), and molded (n = 2) designs. One porcelain sherd retained a maker's mark. No hollowware porcelain vessels were recovered; however, one flatware sherd of indeterminate tableware was recovered. The remaining 7 sherds could not be assigned to either vessel category or form. The vessel categories are represented by sherds from various vessel parts and include rims (n = 1), bodies (n = 5), and bases (n = 2).

**Decorations:** Decorative techniques can be temporally sensitive. Certain types of decoration have periods of popularity that are well established, although there is some variability from region to region. Five different techniques of decorations are present in the refined earthenware and porcelain assemblages (Table 49). These techniques were found alone or in various combinations on 25 ironstone, semiporcelain, and porcelain sherds. Refined earthenware and porcelain are discussed together because many of the same decorative techniques were used on both ceramic types.

**Decalcomania:** Two sherds exhibited exclusively decalcomania decoration. Both sherds have indeterminate floral motifs. The porcelain rim sherd, however, has orange flowers, while the semiporcelain body sherd has green leaves.

**Gilded:** A single sherd was decorated solely with a gilded band. This porcelain base sherd exhibited a thin gold leaf band around the exterior base.
Table 49. Site 41LT424 Kitchen Group Refined Earthenware and Porcelain Decorations

<table>
<thead>
<tr>
<th>Decorations</th>
<th>Ironstone</th>
<th>Semiporcelain</th>
<th>Porcelain</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decalcomania</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Gilded</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hand-Painted</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Molded</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Spongeware</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Decalcomania and Molded</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Decalcomania, Molded, and Gilded</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Undecorated</td>
<td>54</td>
<td>3</td>
<td>4</td>
<td>61</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>10</td>
<td>8</td>
<td>86</td>
</tr>
</tbody>
</table>

**Hand Painted:** One ironstone sherd was decorated exclusively with a hand-painted design. A brown indeterminate floral motif decorated the exterior of a body sherd.

**Molded:** A total of 13 ceramic sherds are decorated with molding only. Molded decorations are present on ironstone (n = 8), semiporcelain (n = 3), and porcelain sherds (n = 2). Molding is expressed in several styles of embossed and impressed designs, including floral (n = 3), banding (n = 4), scalloped rim and banding (n = 1), dots and banding (n = 1), facets (n = 1), columns (n = 1), and unidentifiable motifs (n = 2).

**Spongeware:** A single ironstone sherd was identified as spongeware. The rim sherd was sponged with blue paint on a white background on the exterior and interior of the vessel.

**Multiple Techniques:** A total of six sherds are decorated with molding and decalcomania. The three ironstone rim sherds are likely from the same plate, which exhibited a scalloped rim with an indeterminate floral design in silver on the interior. The three semiporcelain rim sherds are likely from the same bowl, which displayed a scalloped rim with a central indeterminate floral design in green on the interior.

A single ironstone sherd is decorated with molding, decalcomania, and gilding. The rim/body/base sherd is from a small plate with a scalloped rim bordered by a gold band above a green and pink floral decal.

**Makers' Marks:** Complete and fragmentary makers’ marks are present on seven of the ironstone and one of the porcelain sherds, representing six individual marks (Table 50). All of the makers’ marks are transfer-print marks that appear on the exterior surface of base fragments. Marks in this assemblage display the British Royal Coat of Arms (n = 1), the German Coat of Arms (n = 1), shield devices (n = 1), unknown motifs (n = 2), or text only (n = 1). The only observed colors include black (n = 2), dark green (n = 1), and green (n = 3). Three makers’ marks could be attributed to particular manufacturers. The remaining three makers’ marks were too incomplete for identification. Each
identified mark originated in a different country including America \((n = 1)\), Germany \((n = 1)\), and England \((n = 1)\).

Table 50. Temporal Data on Identified Ceramic Makers Marks from 41LT424

<table>
<thead>
<tr>
<th>Recovered and Suggested Mark</th>
<th>Manufacturer</th>
<th>Country of Origin</th>
<th>Date</th>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;...r Laughlin / Hudson&quot;</td>
<td>Homer Laughlin.</td>
<td>America</td>
<td>Circa 1900</td>
<td>Lehner 1988</td>
<td>1</td>
</tr>
<tr>
<td>&quot;HL / Homer Laughlin / Hudson&quot;</td>
<td>(cursive script)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;...H. Grindley / England&quot;</td>
<td>W.H. Grindley &amp; Co.</td>
<td>Great Britain</td>
<td>1891 to 1925</td>
<td>Birks 2011</td>
<td>1</td>
</tr>
<tr>
<td>&quot;W.H. Grindley &amp; Co. / England.&quot;</td>
<td>(British Royal Coat of Arms)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;C.T.&quot;</td>
<td>C. Tielsch and Co</td>
<td>Germany (now Poland)</td>
<td>1875 to 1934</td>
<td>Kovel and Kovel 1986</td>
<td>1</td>
</tr>
</tbody>
</table>

Stoneware: Stoneware, found in utilitarian forms, is the second most frequent ware type recovered from site 41LT424 \((n = 67)\). Stoneware hollowware vessel forms include fragments of bowls \((n = 4)\), butter churn lids \((n = 3)\), crocks \((n = 4)\), jugs \((n = 12)\), lids \((n = 2)\), and indeterminate hollowware storageware \((n = 26)\). The remaining 16 sherds and sherdlets could not be confidently assigned to either vessel or form categories. Stoneware fragments recovered at the site include 5 lid sherds, 8 rim sherds, 1 rim/handle/body sherd, 2 handle sherds, 43 body sherds, 4 base sherds, and 4 sherdlets. Stoneware is frequently treated with a glaze or slip but is less commonly decorated. At site 41LT424, six variations of glazes and/or slips are exhibited. These include Albany-like slip, Bristol glaze, Rhenish-like glaze, salt glaze, and two indeterminate slip glazes. Unglazed vessels, known as bisque, are also present within the assemblage (Table 51). A total of 12 stoneware sherds are decorated; 1 has a maker's mark, and the remaining 54 sherds are undecorated and unmarked.

Surface Treatment: The most common surface treatment to stoneware consists of variations of an Albany-like slip glaze \((n = 47)\), followed closely by variations of Bristol Glaze \((n = 43)\). Slip glazing of the interior and exterior of a vessel with Albany-like slip generally predates 1890 (Greer 1981). A total of seven sherds from the site exhibit this form of slip. Two split sherds retain only an external Albany-like slip. Albany-like slip glazes were commonly present on the interior only of vessels. A single sherd displayed an unidentified pale red slip glazed exterior with an Albany-like interior, while two sherds displayed an unidentified very pale brown slip glazed exterior with an Albany-like interior. Two sherds with unglazed exteriors were also found in conjunction with Albany-like slipped interiors.
Variations of Bristol glazes include use of this glaze alone or in combination with Albany-like slips. Bristol glazes were commonly seen on the exterior of vessels with an Albany-like interior from 1880 to around 1915 (Greer 1981). A total of 26 stoneware sherds were treated in this manner. After 1915, Bristol glazes were commonly used alone on stoneware vessels. Fourteen sherds were glazed internally and externally with a Bristol glaze. Additionally, two split sherds retain only an external Bristol glaze. One sherd of Bristol glazed stoneware also exhibited an Albany-like slip dip. Albany-type slip glazes at the shoulder, mouth, neck, and interior were popular prior to 1920 (Greer 1981).

Salt glaze is the third most frequently occurring surface treatment in the stoneware assemblage. Seven sherds exhibit a salt glazed exterior. Five of these sherds are internally Albany-like slipped, and two sherds were left unglazed, or bisque.

Two Rhenish-like slip glazed sherds, a variation of traditional salt glazing, were recovered from the site; they exhibit a brown color under a colorless, textured glaze.

**Decorations:** Twelve of the 67 stoneware sherds recovered from site 41LT424 display evidence of decoration. Decorative techniques include molding (n = 8), hand painting (n = 3), and incising (n = 1). Different manners of molded designs are the predominant type of decoration, which consists of annular grooves around the exterior (n = 7) and molded grooves on a handle (n = 1). Molded decorations appeared on variations of salt glazed, Albany-like slipped, and Bristol glazed
sherds. Hand-painted designs were found on three sherds in unknown cobalt blue motifs exclusively on Bristol glazed exteriors. An incised line is located on the exterior of a Bristol and Albany-like sherd. None of these decorations are considered more temporally diagnostic than the surface treatment itself.

**Maker's Mark:** Only one maker's mark was identified within the stoneware assemblage. The mark consists of an impressed “3” on the surface of a Bristol glazed butter churn lid. This number represents a vessel capacity mark. It is likely that the churn held a volume of 3 pints, quarts, or gallons.

**Glass**

Kitchen container glass (n = 573) includes fragments of vessel glass (n = 209), bottles (n = 346), jars (n = 11), jar lid liners (n = 4), and unknown container glass (n = 3). Numerous artifact forms of each vessel type were identified, and include rim shards, body shards, base shards, and complete containers (Table 52). A total of 32 glass shards exhibit evidence of burning. Multiple attributes of glass containers can be temporally indicative and may include color, technological characteristics, decorations, and manufacturing marks.

<table>
<thead>
<tr>
<th>Category</th>
<th>Artifact Form</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle</td>
<td>Rim Shard</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Body/Rim/Base Shard</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Body/Base Shard</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Body Shard</td>
<td>195</td>
</tr>
<tr>
<td></td>
<td>Base Shard</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Complete</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>346</td>
</tr>
<tr>
<td>Jar</td>
<td>Rim Shard</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Body Shard</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Base Shard</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>11</td>
</tr>
<tr>
<td>Jar Lid Liner</td>
<td>Rim Shard</td>
<td>4</td>
</tr>
<tr>
<td>Vessel</td>
<td>Rim Shard</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Body Shard</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>Base Shard</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>209</td>
</tr>
<tr>
<td>Unknown</td>
<td>Shardlet</td>
<td>3</td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td>573</td>
</tr>
</tbody>
</table>

**Color:** Colors in the glass assemblage include amber, aquamarine, aqua-tint, colorless, dark amber, green-tint, light yellow amber, olive, and opaline (Table 53). Solarized glass, or sun-colored
amethyst glass, is a subcategory of colorless glass. The glass assemblage includes 11 shards of solarized glass. Of these colors, the most temporally indicative are solarized glass—which dates from around 1890 to 1920, and the various shades of amber glass—which generally predate 1920 (Lindsey 2011a).

Table 53. Glass Container Colors Present at 41LT424

<table>
<thead>
<tr>
<th>Category</th>
<th>Artifact Color</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle</td>
<td>Amber</td>
<td>295</td>
</tr>
<tr>
<td></td>
<td>Aquamarine</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Aqua Tint</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Colorless</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>(Solarized)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Dark Amber</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Light Yellow Amber</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Olive</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>346</td>
</tr>
<tr>
<td>Jar</td>
<td>Aquamarine</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Aqua Tint</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Colorless</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(Solarized)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>11</td>
</tr>
<tr>
<td>Jar Lid Liner</td>
<td>Opaline</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4</td>
</tr>
<tr>
<td>Vessel</td>
<td>Aquamarine</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Aqua Tint</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Colorless</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>(Solarized)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Green Tint</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>209</td>
</tr>
<tr>
<td>Unknown</td>
<td>Amber</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Grand Total</td>
<td>570</td>
</tr>
</tbody>
</table>

**Technological Attributes:** Technological attributes of historic glass containers encompass a wide variety of characteristics, and in many cases, relate closely to the manner in which the container was produced. Temporally indicative features include bubbles, suction scars, and finishes.

**Bubbles:** Air bubble inclusions were observed in 374 shards of container glass, accounting for 65 percent of the sample. These inclusions are the result of irregularities in the production process, which were all but successfully eliminated by 1920 (Polak 2000).
**Suction Scars:** Evidence of suction scars is present on four bottle bases and one jar base. Suction scars are characteristic marks produced by the Owens Automatic Bottle Making Machine. Bottles produced with suction scars generally postdate 1910 and predate 1947 (Lindsey 2011b).

**Finishes:** A total of 18 rim specimens from bottles and jars retained portions of the finishes, of which only 14 are identifiable. Five different finishes are present within the assemblage, while only two methods of production were noted. The finishes include bead \((n = 1)\), patent \((n = 1)\), brandy \((n = 3)\), double ring \((n = 5)\), oil \((n = 1)\), and external continuous thread \((n = 3)\). All of these types are present on bottles, with the exception of the external continuous threads, which are present on jars. These finishes are not temporally sensitive as most were used from the nineteenth century to the twentieth century, including the external continuous thread, which dates from the early twentieth century to the present day.

The two methods of finish production present at the site include applied finishes \((n = 1)\) and machine-made finishes \((n = 17)\). One example of an applied finish was exhibited on an unidentifiable rim finish. Although the finish is unknown, this specimen likely dates to before 1915 (Lindsey 2011c). Conversely the 16 fully machine-made finishes postdate 1905 and most likely 1915 (Lindsey 2011c).

**Decorations:** A total of 93 glass shards exhibited molded characteristics other than makers' marks, which can be considered decorative elements. Decorative treatments to glass containers within the Kitchen Group include molding \((n = 7)\), embossing \((n = 81)\), and pressing \((n = 4)\). Types of embossing present in this assemblage include text \((n = 72)\), floral designs \((n = 3)\), and indeterminate motifs \((n = 7)\). A detailed list of bottle embossing is presented in Table 54. Molded specimens have panels \((n = 6)\) or scalloped rims \((n = 1)\). pressed glass decorations include panels \((n = 1)\), facets \((n = 1)\), and linear patterns \((n = 2)\). Temporally indicative decorations from the site include embossed texts, which date from 1900 to 1929.

**Makers' Marks:** Within the glass assemblage at site 41LT424, 16 makers' marks were found on the bases of glass bottles and jars and along the outside rim of jar lid liners. A total of 11 individual marks are present, but only 6 marks could be attributed to specific manufacturers (Table 55). These marks date from 1894 to 1980. The earliest production dates have a mean of 1908, mode of 1916, and a median of 1911. The latest production dates have a mean of 1936, mode of 1929, and a median of 1929. Therefore, it is likely that the makers' marks from the site date from the beginning of the nineteenth century to around 1929.
### Table 54: Decorative Embossing on Glass Containers from 41LT424

<table>
<thead>
<tr>
<th>Object Form</th>
<th>Embossed Element</th>
<th>Year</th>
<th>Count</th>
<th>MNV*</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle</td>
<td>&quot;FULL QUART&quot;</td>
<td></td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jar</td>
<td>&quot;...ASO...&quot;; and motif</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...BOTTLE&quot;; &quot;...1914&quot;; &quot;...OTEC...&quot;; &quot;...PTED&quot;</td>
<td></td>
<td>20</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...EW P...&quot;; &quot;ADO...&quot;; &quot;...TIVE...&quot;; &quot;...JULY&quot;</td>
<td></td>
<td>10</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...N...&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...OUNCES&quot; and &quot;...S.A.&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...R...&quot;; &quot;...S.C...&quot;; &quot;...ORK...&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jar</td>
<td>&quot;S KERR GLASS MA...&quot;, &quot;PAT AU 3...&quot;</td>
<td>1915</td>
<td>1</td>
<td>1</td>
<td>U.S. Patent No. 1,152,107</td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...S...&quot;</td>
<td></td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Vessel</td>
<td>&quot;...S...&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...THE WO...&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...E&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jar</td>
<td>&quot;3&quot; for 3 quarts</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jar</td>
<td>&quot;5&quot; for 5 quarts</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;COCA COLA BOTTLING CO. LAWTON, OKLA., &quot;ON&quot;; &quot;E3&quot;</td>
<td>1900-1919</td>
<td>1</td>
<td>1</td>
<td>Antique Bottle Collector's Haven 2011</td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;GROVES TASTELESS CHILL TONIC PREP'D BY PARIS MEDICINE CO ST LOUIS&quot;</td>
<td>1916-1929</td>
<td>4</td>
<td>2</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;McCORMIC &amp; CO. EXTRACTS SPICES &amp; ETC. BALTO, MD.&quot; on front panel</td>
<td>1911-1929</td>
<td>1</td>
<td>1</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Vessel</td>
<td>possible &quot;8&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Indeterminate floral design</td>
<td></td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Indeterminate floral design and &quot;Paul Jane&quot;</td>
<td></td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...BALT...&quot; possibly for Baltimore</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;...ONE&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>&quot;DR W B CALDWELL'S SYRUP PEPSIN...&quot;</td>
<td>1916-1929</td>
<td>5</td>
<td>1</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>Indeterminate embossing</td>
<td></td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Indeterminate embossing &quot;...R...&quot; or &quot;...H...&quot;</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>81</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>

*Minimum number of vessels

### Metal Utensils

One piece of metal cutlery was collected from site 41LT424 belonging to the Kitchen Group. It consists of an iron alloy and pewter fork. The fork consists of three tines and a flat, integral bolster with one intact pewter mount. The mount would have attached scaling of wood, bone, horn, or other such material to the handle with the aid of at least two pinholes, which served as rivets. Composite cutlery of this style dates from 1850 to at least the 1880s (Noël Hume 1980).
**Table 55: Makers’ Marks on Glass Containers from 41LT424**

<table>
<thead>
<tr>
<th>Object Form</th>
<th>Marker’s Mark on Base</th>
<th>Maker</th>
<th>Year</th>
<th>Shard Count</th>
<th>MNI*</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottle</td>
<td>Embossed “987” in diamond</td>
<td>Unknown</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed “LAWTON”</td>
<td>Unknown</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed “i” inside diamond</td>
<td>Illinois Glass Company</td>
<td>1916–1929</td>
<td>10</td>
<td>4</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed “09” and “O” inside square</td>
<td>Owens Bottle Company</td>
<td>1911–1929</td>
<td>1</td>
<td>1</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed with “A.B. CO.” and “A15”</td>
<td>American Bottle Company</td>
<td>1905–1929</td>
<td>1</td>
<td>1</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed with “D68” in diamond and “1”</td>
<td>Unknown</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed “N” in square</td>
<td>Obear-Nester Glass Company</td>
<td>1894–1980</td>
<td>1</td>
<td>1</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td>Bottle</td>
<td>Embossed “...C...”</td>
<td>Unknown</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Jar Lid</td>
<td>Embossed “P C”</td>
<td>Unknown</td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Liner</td>
<td>Embossed “GENUINE BOYD MASON CAP”</td>
<td>Illinois Glass Company</td>
<td>c. 1900</td>
<td>3</td>
<td>3</td>
<td>Toulouse 1971</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>22</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

*MNI = minimum number of vessels

**Summary**

The kitchen material suggests that the primary domestic occupation of site 41LT424 dated from the late nineteenth into the mid-twentieth century. Diagnostic ceramic materials imply that the site could have been occupied as early as 1842 based on the presence of ironstone and some salt glazed stoneware. The lack of contemporaneous and earlier wares, however, suggests a later date as evidenced by dated makers’ marks from 1875 to 1934, as well as a predominance of decorations that postdate 1890. Decorative varieties encountered on ceramic wares, such as decal ware, are consistent with occupation into the 1930s, as are stoneware glazes, which were produced until the 1940s. Glass containers at the site are also consistent with an occupation dating to before the turn of the nineteenth century and continuing into the 1930s, as evidenced by diagnostic colors that date from 1880 to 1920, finish types that date predominantly after 1905, and decorative embossing that dates from 1900 to 1929. The majority of the makers’ marks on glass containers also date from around 1900 to 1929. The single piece of cutlery recovered from the site could have been manufactured as early as 1850, but was in production into at least the 1880s. The Kitchen Group appears to represent occupation from around the end of the nineteenth century into the 1930s.
**Personal**

Three artifacts recovered from site 41LT424 were placed within the Personal Group. There is one personal hygiene item and two toys. Only one artifact from the Personal Group exhibited evidence of burning.

The single hygiene item is a plastic hair comb. The comb is made from an unidentified black plastic with thin teeth. Plastics were produced as early as the nineteenth century and remain in production today. Consequently, the comb is not considered to be temporally sensitive.

The toy assemblage is represented by a porcelain doll arm and a fragment from a die-cast toy train. The porcelain doll arm is glazed and appears to have been burned. The train fragment is die cast of iron alloy. While both types of toys remain in production, porcelain dolls have been produced since the early 1800s and die-cast toys have been produced since the early 1900s.

Artifacts recovered from site 41LT424 within the Personal Group are not considered temporally sensitive. They are not, however, inconsistent with a late-nineteenth- to early-twentieth-century domestic occupation. Toys at the site suggest the presence of one or more children during this time period. The Personal Group suggests familial occupation of 41LT424 during the nineteenth and twentieth centuries.

**Tobacco**

The Tobacco Group contains artifacts related to tobacco and the consumption of tobacco products. At site 41LT424, snuff bottles were recovered within this category, and a single ferrous metal tobacco tin was observed but not collected. A total of 75 specimens of amber glass were identified as snuff bottles or snuff bottle fragments. Four complete bottles were recovered along with rim shards (n = 1), rim/body/base shards (n = 66), and base shards (n = 4). No decoration was evident; however, all the bottles and shards contained bubbles. Other technological attributes include suction scars on three of the complete bottles. Only five of the intact rims could be identified as machine-made bead finishes. Makers’ marks were present on 15 base fragments and three complete snuff bottles. The marks consist of a series of two to three raised circles. Varying numbers of dots commonly occur on the bases of snuff bottles; however, the significance of the various forms is unknown. Within the Tobacco Group assemblage, no artifacts show evidence of burning.

In summary, the only tobacco-related products recovered from site 41LT424 were snuff bottles dating from after 1905 to circa 1920. This possibly indicates tobacco consumption at the site during the early twentieth century.

**Unknown**

A total of 281 historic metal artifacts recovered from site 41LT424 were categorized as unknown or were too fragmentary to confidently assign to a functional group. Additionally, 18 pieces of
thermally altered rock and 2 pieces of burned clay were assigned to the Unknown Group due to their unidentified function.

A total of 280 unidentified iron alloy fragments were recovered. This total includes 266 unidentified objects, and 14 objects that are too rusted and fragmentary to identify. One brass object also remains unidentified.

Thermally altered rocks recovered from the site consist of fire-cracked hematitic sandstone (n = 10, 78.44 g) and fire-cracked sandstone (n = 6, 238.38 g). Pieces of hematitic sandstone range in color from brown, reddish brown, to dark reddish brown, while the sandstone is a reddish yellow.

Two pieces of burned clay were recovered. The burned clay is a very pale brown and has a mass of 3.2.

The 301 artifacts within the Unknown Group could not be assigned to particular functional groups either due to incompleteness or absence of identifying characteristics. The presence of these materials at 41LT424 is, however, not inconsistent with a residential/agricultural occupation dating to the later nineteenth to early twentieth century.

**Faunal Remains**

A total of 123 faunal specimens were recovered from three shovel tests, two test units, and five backhoe trenches at site 41LT424. The condition of preservation is generally fair. Although the faunal assemblage exhibits extensive predepositional and postdepositional breakage, degradation from burning, erosion, and animal gnawing was fairly limited.

One specimen could not be identified at any taxonomic level. The remaining 122 remains included 96 mammalian bones, 14 remains attributable to birds, 11 bones that could only be identified as vertebrate, and one mussel shell fragment.

Of the 96 mammalian bones, 2 (2.1 percent) are attributed to large mammals. One of these was a cattle (*Bos taurus*) bone and one could not be identified more specifically, but is likely attributable to cattle, or possibly horse or large swine. No other large mammal is likely to have been associated with a late-nineteenth- to early-twentieth-century historic occupation in this area.

Eighty-four of the mammal bones (87.5 percent) are attributed to medium-sized mammals. Of these, 15 are swine (*Sus scrofa*) bones and 3 are medium-sized artiodactyls. The remaining 69 medium-sized mammal bones are also likely attributable to pigs, but given the historic context, they could easily be from sheep, goat, dog, white-tailed deer, or young cattle or horse.

The remaining 10 mammalian bones include 3 small to medium-sized mammals, 2 bones attributable to small mammals, 1 rodent bone, and 4 bones identified only as mammalian. The 14 specimens attributable to birds include 2 cranial fragments from a chicken (*Galus galus*) and 12
specimens attributable to birds include 2 cranial fragments from a chicken (*Galus galus*) and 12 specimens attributable to medium-sized or medium-to-large birds that could not be identified more specifically. This size range might include chicken, turkey, duck, or other waterfowl.

Only limited evidence of cultural modification was apparent on the assemblage. One bone from Lot 56.16, a longbone diaphyseal fragment from a medium-sized mammal, exhibited evidence of sawing. Because of the small area of modification, it could not be determined whether the sawing was done with a hand saw or a larger commercial saw. Only six specimens exhibited evidence of burning. Fifteen of the large or medium-sized mammal longbones show predepositional spiral fracturing, suggesting intentional breakage. Rodent gnawing was observed on only one bone in the assemblage. No other animal gnawing was observed.

Regarding procurement practices, the presence of elements of a carcass such as cranial and foot bones not normally transported any distance suggest that swine was probably butchered at the site. Swine bones recovered included cranial and foot bones, suggesting that entire carcasses were probably procured at the site or nearby and brought to the site and processed there.

The assemblage represents at least one cattle and three swine individuals. The single cattle bone exhibited fused epiphysis, indicating an adult individual. Based on the condition of the teeth recovered, at least three swine individuals are represented including a young juvenile about 6 to 10 months old, an older juvenile about 1.5 to 2 years old, and an adult about 3 to 5 years old.

**Excavation Results Summary**

The cultural materials observed and recovered on-site represent a historic farmstead occupation dating from the late nineteenth century into the early twentieth century. The Architecture Group indicates building activities began prior to the turn of the twentieth century and continued into the 1930s or 1940s. Artifacts from the Activities, Arms, Clothing, Household, Kitchen, Personal, and Tobacco groups are consistent with a residential occupation of multiple individuals, including children, likely beginning prior to 1900 and continuing to around 1930.

Excavation at 41LT424 demonstrated that intact structural remains have not been preserved on-site. This work did, however, identify discrete trash pit and push pile features that are thought to have arisen following the abandonment and destruction of a late-nineteenth- to early-twentieth-century farmstead. The soils across the site (clearly visible in profiles of trenches 8, 21, 23, and 29) are disturbed.

Features 1, 3, and 5 appear to be domestic dumps from the late nineteenth or early twentieth century. Although the precise limits of Feature 1 remain unknown, based on its appearance in adjacent units, trenches, and shovel tests, it is probably 5 to 6 m in diameter. Feature 3 was 5.5 m in diameter, and Feature 5 was 1 to 1.2 m in diameter. All three trash pit features were excavated into the Bt horizon and extended to the same approximate depth (114 to 124 cmbs).
Features 2 and 4 appear to be push piles from the late nineteenth or early twentieth century. Feature 4 likely resulted from the creation of the Feature 3 trash pit, while Feature 2 potentially resulted from the destruction of a small lime-production operation. While the limestone blocks observed on-site do appear to have been intentionally shaped and altered, they are not in a form suitable for use as building material. The presence of mortar not in a building context as well as the possible layer of lime (in nearby Trench 28) suggests that the limestone was brought to the site for lime production. Though fragments of limestone were found elsewhere at the site, the main concentration is located in the vicinity of Feature 2, suggesting that this was likely the original location of the lime-production operation, though it has since been destroyed and disarticulated.

Due to the lack of evidence of a large structure, site 41LT424 likely represents a small-scale family lime kiln that produced lime for local agricultural, and possibly immediate, needs only. The material present does not suggest the presence of a standing kiln, but rather the production of lime using the "heap method." In this method, alternating layers of limestone and coal (or other available fuel) were laid down over a layer or two of cordwood mixed with kindling. Once the heap was complete, it was covered with earth (Figure 71), with an opening left at the top for the carbon dioxide to escape, and the kindling was lit. The heap was left to burn until all of the limestone was burned (Hearne Democrat 1920:6; Pennsylvania State College 1913:281-283).

The site is located adjacent to a large outcrop of kaolinite that may have been a raw material source for a local nineteenth-century ceramic industry. The kaolinite outcrops on a broad gently sloping ridge above Cox Creek. It occurs below a stratum of hematitic sandstone. Although the outcrop is heavily eroded, the erosion does not appear to be associated with a creek or even an ephemeral drainage. The severity of the erosion in the vicinity of the kaolinite is thought to have been fostered by historic land-use practices, specifically clay mining.
Three ceramic kilns dating to the mid- to the late nineteenth century have been recorded within 10 km of 41LT424. Approximately 1 km northeast of the site is 41LT11, known as the Johnson-Knox-Fowler Pottery Kiln. This kiln was operational from around 1856 to 1910 or shortly thereafter.

Lee Kimik operated a kiln on Heads Creek (41LT198) during the period between 1875 and 1883 (Sherman et al. 2006). The Kimik Kiln is located about 10 km to the south of site 41LT424. Another nearby kiln was located at site 41LT441, near the town of Oletha, Texas, in the northeast corner of the Kosse Mine. According to records on file at TARL, two other kiln sites have been recorded in Limestone County, including 41LT122 (which operated from the 1850s to around 1870) and 41LT267 (which operated from 1870 to 1910). None of these sites have been intensively studied.

NRHP testing did not obtain any conclusive evidence of presumed kaolinite mining at 41LT424; however, the site's proximity to three known ceramic manufacturing sites (41LT11, 41LT198, and 41LT441), a ceramic artifact assemblage containing a high concentration of ware types produced locally, and a large outcrop of kaolinite all point to a connection to a local ceramic industry.

**ARCHIVAL RESEARCH**

**Methods**

Archival research was conducted to determine site 41LT424's relationship to a local ceramic-production industry, including whether it was a source of clay for local ceramic manufacturers, and to determine who owned and/or occupied the property during the historic period. Historians also sought to identify what role the site may have played in local community development. This research was accomplished through additional primary source research into the associated land parcel's history. Specifically, project historians conducted additional deed, probate, and vital records (birth, death, marriage, etc.) research at the Limestone County Courthouse in Groesbeck, Texas, completed intensive, year-by-year ad valorem tax research at the Texas State Library in Austin for the time periods suggested by the deed and archeological record, and supplemented the previous census research as needed. Historians also consulted previous studies concerning the ceramic production industry in Limestone County in order to identify potential connections between the owners of the apparent kaolin quarry at site 41LT424 and local independent kiln operations in the area. Historians used this research to determine whether historic owners/occupants of the property were significant to local or regional history. Finally, historians used all of the materials gathered during this effort to develop a general historic background that provides contextual information relevant to the site and a site-specific history detailing the property's historic owners and potential occupants, both of which are included in subsequent sections of this chapter.

The archival research obtained evidence that the parcel containing site 41LT424 maintained connections to the regional pottery-manufacturing industry beginning as early as the 1860s that
extended through the industry's decline in the county during the 1920s and 1930s. Additionally, several of the historic owners may have occupied the parcel throughout its history, and there is evidence of a tenant occupation that may have extended through the early twentieth century. Though historians did not uncover concrete archival evidence regarding the scale and character of the quarry operation, interrelationships among owners of the subject property and individuals known to have been involved in ceramic manufacture in conjunction with deed, tax, and census evidence provided confirmation that site 41LT424 likely served as a clay source for several distinct kiln operations in Limestone County. The ceramic-production industry, which was significant both locally and regionally, served as an important supplement to the county's predominant agricultural sector and represented a significant factor in the county's early economic development.

**History of Site 41LT424**

Site 41LT424 is located west of the small farming community of Oletha in Limestone County, Texas. Archeological evidence indicates that it may have served as a kaolin clay-quarrying site, and that other industrial activity, including lime production, may have occurred there during the historic period. Archival research supports the archeological evidence and suggests the property may have had connections with the regional pottery-making industry as early as 1860. Commercial pottery manufacture in Limestone County continued from circa 1859 through circa 1930, and sources indicate that the possible quarry site could have been in use throughout this period. The archival information also implies that several of the property owners and/or their associated tenants could have resided on the property throughout its history. Together, the archival and archeological evidence provides further insight into the history of the broader farming community that included the villages of Oletha and nearby Pottersville, including the social and economic relationships that existed between historic community members, and contributes to the understanding of early industrial development in the region.

The archival research also revealed that the individuals who owned the possible quarry site and those associated with several local independent kiln operations may have maintained economic and possibly personal relationships with each other. This evidence indicates the possible quarry could have supplied more than one commercial pottery manufacture operation during the late nineteenth and early twentieth centuries. Additionally, at least one owner of the property containing site 41LT424, Joseph Allman, controlled and may have operated the quarry site and a nearby kiln (41LT441) at the same time during the late nineteenth century. The tract containing site 41LT424 was part of his homestead and farm from 1881 through his death in 1911, and kaolin quarrying likely served as an important supplement to his agricultural income during at least some portion of this period.

The current 77.6-acre tract containing site 41LT424 is located within the original H. Billington Survey (Abstract 77) in Limestone County, Texas. Billington patented his Robertson third-class headright (268 acres) on January 15, 1859 (Texas General Land Office [GLO] Records, Limestone
County Abstract 77). The State of Texas issued third-class headrights to individuals who arrived in Texas between October 1, 1837, and January 1, 1840. Typically, heads of families were granted 640 acres, and single men received 320 acres (GLO n.d.). It is unclear why Billington only received 268 acres, and though it was common practice to patent portions of the same grant in different geographic areas, GLO records indicate that Billington was not issued any other surveys in the state. The small size of his survey suggests he was single when he received it.

Historians were unable to find an entry for Billington in the 1850 Robertson or Limestone County census records, but by 1860, Hardy Billington (35) lived in Robertson County. Billington, who resided in the Owensville post office precinct, was a farmer who owned $1,462 in real estate and maintained a $950 personal estate. His household included his wife Eliza J. (28), their children Emmerson W. (11), James S. (8), Tumper [sic] (5), and William T. (3), and William Holder, a 19-year-old farm laborer. Associated slave schedules from 1860 indicate that Billington did not render taxes on any enslaved persons. The subject property containing site 41LT424 is located on the boundary of Robertson and Limestone counties, which was not well-defined during the period. As a result, it is possible, though unlikely, that Billington lived on his survey. Nevertheless, review of contemporary tax records indicates his tenure of occupation would have been brief.

By 1870, J.L. and L.V. Billington appear as the property's owners in a conveyance of the tract to Limestone County resident Benjamin Lewis (Limestone County Deed Records A:419). It is unclear how the Billingtons were related to Hardy Billington or whether they purchased or inherited the property, but tax records indicate the parcel was only associated with the Billington family until 1862 at the latest. J.L. and L.V. Billington appear as residents of the Springfield post office precinct in Limestone County in the 1860 census records. In that year, J.L. (31) worked as a farmer. He owned $3,200 worth of real estate and had a personal estate valued at $3,500, which, according to contemporary slave schedules, included an 11-year-old enslaved girl. The household included his wife L.V. (26), their children Isabel (7), Albert (3), and M.D. (1), and Tabetha Billington (66), whose age suggests she was J.L. Billington's mother. Though it is possible that the Billingtons resided on the subject tract at this time, their occupation would have been short. Benjamin Lewis, the grantee in the 1870 transaction, appears as the parcel's owner in Limestone County tax rolls beginning in 1862. However, historians were unable to locate the property in the 1859, 1860, or 1861 tax rolls, insinuating the conveyance could have occurred earlier. It appears the 1870 deed was recorded as a formality for the public record so that Benjamin Lewis could sell the property.

In the 1862 Limestone County ad valorem tax rolls, the value of the 268-acre Billington Survey was assessed at $1,000. The tract was the only property Benjamin Lewis owned. The property's value remained the same in 1863 and 1864; however, its value dropped substantially in 1865 to $500. This decrease in value was likely reflective of the general depreciation in property values that occurred throughout the county and state after the Civil War and not indicative of alterations to or destruction of improvements on the parcel. Neither the Billington Survey nor Lewis appears in the 1866 or 1867 tax rolls. Lewis appears as the owner of the survey once again in 1868 when the...
The property was valued at $536. In 1869, its value was listed as $500, and it remained his only landholdings throughout the period. As a result, it is possible Lewis lived on the property during the 1860s. He rendered taxes on livestock in each year, suggesting the survey contained both his home and farmstead.

The 1870 transfer of the property to Lewis indicates he paid $1,000 for the tract (Limestone County Deed Records A:419). Though he likely purchased the property prior to 1870, $1,000 was a significant sum during the period. The high price and the parcel’s continuously high value in the tax rolls throughout the 1860s indicate it contained improvements and/or that it was already in use as a quarry during this early period. Commercial pottery-making enterprises existed in Limestone County as early as 1859 (Kotter et al. 1988), and pottery manufacture was already a well-established industry in the vicinity of the subject site by the time of the 1870 conveyance.

Census data confirm that Lewis could have lived on the parcel as early as 1860 and provide additional evidence that the subject property may have been in use as a quarry during the early period of pottery manufacture in the region. In 1860, Benjamin Lewis (55) and his family appear in the Limestone County census records living on the boundary between the Willow Creek and Springfield post office precincts. Willow Creek was a small farming community located near and to the south of site 41LT424. Presently, it is located immediately across the Robertson County line (U.S. Geological Survey [USGS] 1966). Lewis was enumerated as a farmer with $1,500 in real estate and a personal estate valued at $700. Lewis’s household included his wife, listed only as F. (49), and their six children Jno. (19), Henry (17), M. (14), A. (11), S. (10), and SAML. (7). The family lived near that of Alberry Johnson, whose occupation is indexed as “potter.” The Lewis and Johnson families were enumerated on sequential census pages, indicating they lived in the same general area, and their geographic proximity provides plausibility to the possibility of an economic relationship between the two men.

Alberry Johnson established the first known kiln in Limestone County (41LT122) in 1859 along the Springfield and Pottersville Road at Dooley Creek. Like other local and regional potters, the Johnson kiln was of the groundhog variety popular in the southern United States during the late nineteenth century. Johnson operated his kiln and potter’s shop for approximately 10 years (until circa 1869) before conveying it and his equipment to William Curtis Knox (Kotter et al. 1988). This conveyance correlates in time with Lewis’s transfer of the property containing site 41LT424 in 1870.

Benjamin Lewis sold the property 1 month after the official conveyance from the Billingtons was entered into the deed record, and the tract’s value had increased substantially. T.C. Moore paid $10,000 for the 268-acre parcel, 10 times the purchase price recorded in the 1870 deed and significantly more than the property’s assessed value in contemporary tax records (Limestone County Deed Records A:421). This high value indicates the property contained significant improvements or maintained associations with an important industry, such as pottery manufacture.
The 1870 census records provide additional evidence that the property was in use as a quarry during this period and that it may have supplied raw materials to more than one facility. In that year, Benjamin Lewis appears in the Limestone County census living near known Oletha-area resident H.H. Stephenson in the Eutaw post office precinct. Stephenson owned and occupied a parcel containing the kiln recorded at site 41LT441 from circa 1865 through his death in 1890 (Dixon et al. 2010; Limestone County Probate Minutes F:320). Though the specific dates that the kiln operated are unknown, it may have been in operation during the period when Lewis and Stephenson lived in close proximity to each other.

Lewis and his family also lived near (two households from) Wm. C. Knox. As previously referenced, Knox purchased the Alberry Johnson kiln (41LT122) around the same time. After acquiring the kiln, Knox moved the associated equipment to what became known as the “Old Potter’s Shop” approximately 2 miles northwest of the present town of Oletha (41LT11) and approximately 1.25 miles northeast of site 41LT424 (see Figure 2). Though the exact date of this transaction is unknown, Knox’s wife Minerva and son Charles were buried in the associated Potter’s Shop Cemetery in 1871, suggesting it occurred before that time. Knox eventually sold the property to John Fowler. Fowler, followed by his son, operated the potter’s shop through circa 1912. During its association with Fowler, the shop was one of the largest in Texas, employing up to 60 workers (Kotter et al. 1988). It is possible that the potential quarry site recorded at site 41LT424 supplied raw materials for one or both operations.

The 1870 census records list Knox’s occupation as “potter,” and he lived one household from the Jas. L. Stone family, whom records indicate became the chief artisan at Knox’s large-scale pottery-making operation (Kotter et al. 1988). Stone’s occupation is listed as “laborer” in the 1870 census. Lewis’s residence near Alberry Johnson in 1860 and the fact that Lewis, Stephenson, Knox, and Stone all lived in close proximity to each other in 1870 indicates a relationship could have existed between the men and that the subject parcel could have been in use as a quarry to supply the Johnson/Knox and Stephenson kilns during the period. Descendants of John Fowler indicate that clay was quarried by pick and shovel and transported to pottery facilities by ox cart and/or by wagons pulled by mules. These basic collection methods suggest the quarry owner and his family could have collected clay without additional support and/or that they may have allowed pottery workers to collect the clay themselves (Unknown 1968).

Deed records indicate that T.C. Moore, who purchased the property containing site 41LT424 from Benjamin Lewis in 1870, retained the portion of the Billington Survey containing site 41LT424 for at least 4 years. After the 1870 conveyance, no further transactions involving the property appear in the deed record until 1874, when Moore, who appears as a lawyer living in Robertson County in the 1870 census, conveyed 152 acres containing the subject site to R.B. Bural for $472 in gold (Limestone County Deed Records A:422). Though the 1870 Limestone County tax records list Moore as a resident, he also owned 235 acres in the R. Flippin Survey. As a result, the subject property could have represented an investment rather than his homestead. In 1870, the 268-acre
tract was valued at $536. Moore does not appear in the tax rolls again as an owner of property in the Billington Survey, but it appears that he sold a portion of it to Mary Runnells as early as 1871. As it is unclear where this portion was located within the survey and as she only owned the property for 2 years, it is possible that the tract included the subject site.

In 1871, Mrs. M. Runnell [sic] rendered taxes on a parcel of unknown acreage in the Billington Survey. The acreage is indecipherable in the records, and no other owners associated with the survey, including Moore, appear in the rolls that year. Mrs. Runnell(s) did not render taxes on any other property and may have occupied the tract. In addition, she owned 300 cattle, a sizable herd, suggesting that a portion of the survey may have been used as rangeland during this period. The following year, Mrs. M. Runnells rendered taxes on 100 acres of the Billington Survey valued at $500 as well as 150 acres in another survey (name indecipherable) valued at $1,050. Her cattle herd included only 30 animals in that year.

In 1860, Mary Runnels (44) appears as a head of household in the Limestone County census records. Her household included her six children W. (18), A.J. (14), Thos. (10), Mary (8), S.W. (6), and M. (5), and a 28-year-old farm laborer named John Runnels. The family lived in the Springfield post office precinct, and Mary is identified as a farmer. She owned $1,600 worth of real estate and had a personal estate valued at $2,500. Historians were unable to find an entry for the family in the 1870 Texas census records; however, she is listed as a resident in contemporary tax records.

Mrs. Runnels (or Runnell) does not appear in the tax rolls as an owner of property in the Billington Survey after 1872, and the survey does not appear in the 1873 rolls at all, including in the resident, nonresident, or unrendered inventories. This absence insinuates Mary Runnells was either unable to pay the taxes or had defaulted on a vendor's lien on the property. In either case, T.C. Moore owned the portion of the survey containing the subject site again by 1874, when he transferred it to R.B. Bural (Limestone County Deed Records A:422). Though the property may have been used for nonindustrial purposes during its association with Moore, archival evidence suggests that it may have reverted to use as a quarry during its association with Bural. Additionally, tax evidence indicates Bural may have occupied the tract.

Randolph Burrell [sic] appears in the 1870 Robertson County census living in the same vicinity as the Lewis, Stephenson, Knox, and Stone families in the general community located near the parcel containing site 41LT424. He lived one household from Jas. L. Stone, who became the chief artisan at the Pottersville kiln, and two households from Joseph Ferguson, the individual credited with founding the Oletha community (Dixon et al. 2010). Bural's obvious association with a larger community including individuals who maintained a documented involvement in the local pottery-manufacturing industry indicates the property could have continued to serve as a quarry during the period.
Tax evidence indicates Bural did not own any other property during his association with the tract. From 1874 through 1878, Bural rendered taxes on the parcel and a small herd of livestock. When he purchased the 152 acres in 1874, it was valued at $380 in the Limestone County tax rolls. By 1875, the property's value had increased to $608. In that year, Bural also owned 40 goats, 6 cattle, 2 horses, and $20 worth of tools or machinery. The property's increase in value suggests Bural made improvements after he acquired the tract. In 1876, the tract was once again valued at $380. It does not appear in the 1877 rolls, and by 1878, it was valued at $456. In that year, Bural also rendered taxes on a wagon or carriage, livestock, and $190 worth of "miscellaneous property." It is possible that the miscellaneous property represented tools used to quarry clay, which Bural could have sold to supplement his farm income. If quarrying activities continued during Bural's tenure of ownership, the property's value as represented in the tax records indicates it was at a smaller scale than during the tract's association with Benjamin Lewis. Nevertheless, Bural's residence near individuals involved in pottery manufacture insinuates clay quarrying could have continued as an economic activity secondary to subsistence agriculture during the 1870s.

Bural owned the now 152-acre tract until 1879 when he transferred the property to Jno. W. and Melvina Young of Falls County in exchange for a 165-acre parcel in Falls County (Limestone County Deed Records J:474). Census records indicate that the Burals relocated to Falls County after this transaction, suggesting they acquired the 165-acre property as their homestead. Randolph Bural (53) appears a single man living with his five children in Falls County by 1880. Historians could find no entry for the Youngs in the 1880 Texas census records; however, they only retained the parcel for a little over a year. In January of 1881 they sold it to Joseph Alleman [sic] for $300 to be paid in livestock, namely 1,000 pounds of pork and 15 cows and calves, among other concessions (Limestone County Deed Records M:340). Due to their short association with the property and residency in Falls County when they originally acquired it, the Youngs may never have lived there. It is possible they leased the property to tenants during the period who could have lived in the Bural family's former home.

The Allman family owned the property until 1911, and sources suggest they may have used it as a quarry site during at least some portion of their association with it. It is possible they lived on the tract; however, they had an established household in 1880, and tax evidence implies they lived elsewhere. In 1880, Joseph Allman (35) appears as a farmer living in Justice Precinct 6 (Pottersville Precinct) in Limestone County. The record does not indicate whether he owned his property, and his household included wife Margaret C. (28), their children Joseph (7), George S. (5), Margaret I. (2), and Hannah A. (1), two other young women aged 19 and 15 indexed as daughters whose names are indecipherable, and Adley Hyden (23), an apparently unrelated individual enumerated as a farmer. In that year Allmon [sic] appears in the ad valorem tax records as the owner of 160 acres in the nearby A.A. Hyden Survey (Abstract 252). The tract was valued at $400, and as it was the only property he owned, it likely contained the family's home. Sources indicate that Adley Hyden was the son of A.A. Hyden, who patented the Hyden Survey (Sherman and Watkins 2007). Hyden's residence in Allman's home suggests a relationship between the two families.
Detailed review of tax data from the 1880s implies the subject parcel contained improvements during the period but does not provide evidence of industrial interests or activity until 1889. Throughout his ownership of the tract, Allman maintained substantial livestock holdings, and the parcel's proximity to his probable homestead in the Hyden Survey indicates it may have been used for agriculture during the early years of his association with the tract. Regardless of the property's function during the period, Allman's holdings in the Billington Survey appear to have constituted some portion of his home and farmstead throughout his association with the property.

In 1881, Joseph Allman rendered taxes on 152 acres in the Billington Survey as well as 160 acres in the A. Hyden Survey. Together, the parcels were valued at $776. He also rendered taxes on 55 cattle, 200 hogs, 25 sheep, and 2 horses/mules. By 1882, Allman had increased his landholdings to include an additional 160-acre tract in the D.F. Davis Survey. The Davis Survey is adjacent to the Billington Survey and close to the Hyden Survey, suggesting Allman was expanding the size of his farmstead (Figure 72). In that year, the 152-acre subject parcel was valued at $300, an amount comparable to the value of his potential homestead tract in the Hyden Survey, which included 160 acres valued at $320. The 160 acres in the Davis Survey was assessed at $200. Allman continued to maintain sizable livestock holdings, though he only owned 25 hogs and 25 cattle in that year. By 1883, Allman had once again increased his property holdings to include an additional 116 acres in the Billington Survey (giving him control of the entire survey) as well as an additional 30 acres in the G.B. Duncan Survey. The total value of his property in this year was $1,675, and his holdings in the Billington Survey were assessed at $520 total.

Allman rendered taxes on the entire Billington Survey (268 acres) again in 1884 when it was valued at $540, and he still owned land in the Davis and Hyden surveys. He also possessed a significant herd of livestock, including 8 horses/mules and 100 hogs, among other animals. In 1885, Joseph Altman's [sic] holdings in the Billington Survey had been reduced to 217 acres; however, the 150-acre tract containing the subject site was still valued at $500. The remaining 67 acres was assessed at $100. Together with his other real estate in the Davis and Hyden surveys and his livestock and other property, his estate was valued at $2,050. His real estate holdings remained the same in 1886, when his total estate was worth $2,690 and the subject property was described as part of 217 acres valued at $700. By 1887, Allman had sold his extra 67 acres in the Billington Survey and only rendered taxes on the 152-acre subject tract (along with his other landholdings). In that year, it was valued at $625. In 1888, the 152-acre subject tract retained a similar value when it was assessed at $600. His other holdings had increased in value; however, including his 160-acre tract in the Davis Survey, which was assessed at $960, and his 160-acre tract in the Hyden Survey, which was assessed at $640. He also owned 6.25 acres in the nearby Rejon Survey valued at $50. Altogether, his estate was valued at $2,950.
Site 41LT424 in Relation to the Original Texas Land Survey

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Job No.: 100016087
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ATKINS

Figure 72
Finally, in 1889, Allman rendered taxes on the subject property (valued at $600), his two 160-acre tracts in the Davis and Hyden surveys (valued at $800 and $600, respectively), a substantial livestock herd, and $500 worth of machinery, tools, implements, and/or steam engines/boilers. In sum, his estate was valued at $3,470. This reference to some type of machinery is the first suggestion that Allman may have been engaging in industrial activity. Subsequent tax records indicate he expanded this enterprise during the following years and that the industrial activity may have been commercial in nature.

Census records are not available for 1890, but tax records indicate the Allman family continued to live in the vicinity of the subject site and that Allman continued to be involved in some sort of industrial enterprise. He also continued to maintain sizable livestock holdings during the period, insinuating he also engaged in agriculture. In 1890, Allman rendered taxes on 144 acres in the Billington Survey, and its value had increased significantly from $600 in 1889 to $864. At the time, it was the most valuable property he owned. He no longer owned property in the Davis Survey, and his other real estate holdings included 160 acres in the Hyden Survey ($600) and 7 acres in the M.C. Rejon Survey ($41). He also owned $1,000 worth of "manufacturer's tools, implements, or machinery" and two wagons/buggies. In total, his estate was valued at $3,530. The subject parcel's increase in value as well as Allman's ownership of some type of tools or machinery implies he may have initiated or expanded his quarrying enterprise during this period.

Throughout the remainder of the 1890s, Allman continued to render taxes on both machinery/tools and steam engines/boilers, and the value of the subject property, which was recorded as varying acreages, remained relatively high. In 1891, his 142-acre portion of the Billington Survey was assessed at $568, and he owned $500 worth of manufacturer's tools/implements/machinery and $700 worth of steam engines/boilers. In 1892 and 1893, the parcel was described as 144 acres and was valued at $576 and $570, respectively. The value of his industrial resources remained steady in those years as well and included $500 worth of tools/machinery and $500 worth of steam engines/boilers. In 1894, the property's value increased significantly when the 143 acres was assessed at $1,430. His machinery and engines/boilers were valued at $400 each in that year.

In 1895, Allman reportedly owned 141 acres in the Billington Survey valued at $564 as well as $500 worth of tools/machinery and $600 worth of engines/boilers. This was the last year that he rendered taxes on his homestead property in the Hyden Survey. The tax rolls indicate Allman acquired a 143-acre tract in the Rejon Survey around 1891, and its value jumped significantly between 1895 ($572) and 1896 ($1,080), suggesting he may have constructed improvements (possibly a dwelling) between those years and relocated there before selling his property in the Hyden Survey. The tract in the Rejon Survey remained the only other property Allman owned through at least 1910 (the last year tax rolls were available for review), providing further confirmation that it contained his homestead.
From 1896 through 1899, Allman only rendered taxes on land in the Rejon and Billington surveys. In each year, the property in the Rejon Survey, which was comparable in acreage to the subject parcel, had a greater value suggesting it contained his homestead. The value of the property in the Billington Survey between those years averaged between $600 and $700 except in 1899 when it was assessed at $885. In each year, Allman rendered taxes on both machinery/tools and engines/boilers, which together were worth an average of approximately $1,000 per year.

Census records indicate the Allman family still lived in Precinct 6 in 1900. In that year, Joseph Allmon [sic] is enumerated as a 59-year-old farmer who owned his property. His household included wife Margaret C. (44), children Elizabeth (16), Eva (13), and Jonas C. (5), and Rachel (16), Ab (14), and Richard H. (12) Stevenson [sic], listed as his nieces and nephew. Other deed and probate evidence indicate that the Stephensons were the children of H.H. and Hannah Stephenson, who owned and occupied property containing a kiln near Oletha (site 41LT441). Allman’s wife Margaret was Hannah Stephenson’s sister (Limestone County Probate Records J:272). These children inherited the property containing site 41LT441 after the death of their father (1890) and mother (before 1900) (Dixon et al. 2010). As a result, Joseph Allman may have been simultaneously operating the quarry and the kiln during the late nineteenth and/or early twentieth century, possibly for the benefit of his wards.

Though the kiln may have been constructed by Stephenson, other archival evidence suggests that the facility may have been constructed after his death. Limestone County probate records indicate Stephenson died in Bell County on March 1, 1890 (Limestone County Probate Minutes F:320). According to his will, his second wife Hannah Stephenson received title to the 420-acre tract in the Rejon Survey that contained their homestead and the kiln. Upon her death, the property was to pass to their children, Rachel, Abbie, and Richard (Limestone County Probate Minutes F:320). Subsequent district court records from 1900 indicate that Hannah did not comply with her husband’s wishes and also provide evidence that the kiln may have been constructed in the years immediately following Stephenson’s death.

In Cause #3519, District Court of Limestone County, H.H. Stephenson’s children filed a lawsuit against W.S. Roberts et al. in which they claimed Hannah had allowed her new husband T.F. Thames and his associate W.S. Roberts to acquire the Stephenson homestead property by defaulting on her tax payments. The men subsequently sold a portion of the tract (162.5 acres) to W.S. Reeves. The judge ruled in favor of the children, awarding them “all of the 420 acres less the land decreed to W.S. Reeves in this judgment” (Limestone County District Court Records I:499). The judgment also indicated that W.S. Roberts had constructed improvements on 120 acres of the property after his acquisition of it. In order to acquire full title to the property, the children had to pay Roberts $750, the assessed value of the unidentified improvements, and a $125 surveying fee with interest. They were given a year to fulfill these requirements before the property would be sold at auction (Limestone County District Court Records I:499). It is possible that the referenced improvements included the kiln recorded at site 41LT441.
Contemporary census and tax evidence indicate Allman may have had a relationship with W.S. Roberts, with the kiln recorded at site 41LT441, and with the local pottery-manufacturing industry as a whole. In 1900, the same year as the lawsuit between the Stephenson heirs and Robertson and the same year in which the Stephenson children appeared as residents in their uncle’s household in census records, Allman lived immediately adjacent to (one household from) the W.S. Roberts family. Their geographic proximity indicates the men at least knew each other, and Allman’s role as the guardian of the Stephenson children indicates they likely had interactions regarding the parcel containing the kiln.

Two years later, in 1902, Allman rendered taxes on what was described as 200 acres in the Rejon Survey in the name of the Stephenson heirs, suggesting they had fulfilled the stipulations included in the district court judgment. The property was valued at $1,200. It is unclear how the children were able to raise the required funds; however, their uncle’s association with a clay source and Roberts’s apparent interest in the kiln parcel implies the payment could have been made in goods in kind. Though there is no record of what arrangement was made between the parties, by 1903, tax records indicate Allman owned $1,200 worth of goods, wares, and merchandise and maintained $300 in cash in addition to his landholdings, livestock, machinery, and engines/boilers. It is possible that these goods were ceramic wares he received in return for supplying kaolin to the kiln operation and/or that he was operating the kiln by this time. The reference to cash on hand is the first time Allman appears with money in the tax records and provides additional confirmation he was engaged in trade or some form of commercial activity. Though Allman did not render taxes on the 200-acre tract in the name of the Stephenson children in 1903, his role as their guardian during the period they maintained ownership of the parcel containing the kiln, his ownership of the possible quarry, and his occupation in close proximity to the Roberts family provide evidence that he maintained some involvement in the local pottery-manufacturing industry during this period.

Despite his likely involvement in quarrying and manufacturing activities, contemporary census records listed Allman’s occupation as farmer throughout his association with the quarry tract. The possible kiln proprietors H.H. Stephenson and W.S. Roberts also appear as farmers in all available census records. This economic dependence on agriculture fits in well with regional patterns, as with few exceptions, pottery manufacture existed alongside and generally supported the more prevalent agricultural sector during the period (Anderson and Harris 2006).

Joseph Allman retained the property until his death circa 1911, and tax evidence suggests that he continued to be involved in industrial and commercial activities as a supplement to his agricultural interests through at least 1910. In 1904, tax rolls list Allman as the owner of 147 acres in the Billington Survey ($600), 148 acres in the Rejon Survey ($800), various livestock, $1,500 worth of goods/wares/merchandise, $350 worth of steam engines/boilers, and $150 in cash. His total estate was valued at $3,940. His property in the Billington Survey was valued at $735 in 1905, $940 in 1906, $735 in 1907, $930 in 1908, $575 in 1909, and $710 in 1910, the last year tax records were available for review. He rendered taxes on goods/wares/merchandise and steam engines/boilers in
each year, which possessed an average value of approximately $1,200 and $250, respectively. He also possessed cash on hand each year. The property’s continuously high value throughout this period as well as Allman’s continued interest in industrial and commercial resources indicates the subject tract may have continued to serve as a quarry and that Allman may have also had some involvement in the conveyance of completed wares.

Though historians encountered no associated probate records, after Allman’s death circa 1911, his holdings in the Billington Survey appear to have passed to his wife Margaret. In October of that year, Margaret Allman conveyed the 152 acres to J.W. Lummens (some documents list the name as Lummus) for $900. The transaction lists both parties as residents of Limestone County, and the high price suggests the property contained improvements (Limestone County Deed Records 50:384). This conveyance correlates to the period when the pottery-making industry in the area was in decline. Sources indicate the Potter’s Shop at Pottersville closed around this time (circa 1912) (Anderson and Harris 2006; Broman 1936), and the Stephenson heirs no longer maintained an interest in the parcel containing the kiln at site 41LT441 after 1905 (Dixon et al. 2010). The Kosse Fire Brick and Tile Company, which together with the Potter’s Shop at Pottersville represented the primary large-scale pottery-manufacture operations in Limestone County, closed circa 1890, reducing the market for kaolin in the area.

Nevertheless, pottery manufacture continued in some capacity through the early twentieth century. The kiln at site 41LT441 may have continued to operate under its subsequent owner, as discussed later in this section, and secondary sources suggest that Houie and Douie Stone, the sons of J.L. Stone who served as the chief artisan at the Pottersville kiln, operated a pottery (41LT197) near Robert’s Cemetery Road approximately 2.5 miles north of FM 937 near Old Union during the early twentieth century. Though no primary documentation has been conducted for this site, archeologists estimate that it was in operation from approximately 1915 through 1925 (Anderson and Harris 2006).

Historians were unable to find an entry for J.W. Lummens or Lummus under any spelling variation in the 1900 or 1910 Limestone County census records; however, the family of William Lummus rented a farm in close proximity to the Allman family in 1900. Their geographic proximity implies there could have been a connection between the two families. In 1910, a John T. Lummus lived with his family in Precinct 3 of Limestone County in the “Old Farrar Neighborhood.” It is possible that this individual represents a transcription error for J.W. Lummus, who purchased the subject tract in 1911.

Contemporary deed records indicate there was some controversy regarding title to the property during this period. In 1912, P.M. and Lizzie Lummus appear as owners of the tract in a deed in which they conveyed the property, along with two additional tracts, to J.W. Lummus for $500 with a vendor’s lien (Limestone County Deed Records 71:362). It is unclear how P.M. and Lizzie Lummus acquired an interest in the tract; however, J.W. Lummus appears as the sole owner in a 1914
transfer of the property to B.A. Alston (Limestone County Deed Records 81:25). Alston purchased
the property, less 19 acres owned by Joseph Allman's minor son Jonas, along with another 71-acre
tract in the adjacent Lynenburg Survey, for $3,068, including $2,300 cash and the rest in vendor's
liens (Limestone County Deed Records 81:25).

In 1910, P.M. and Lizzie Lummus appear as renters living in Precinct 6 of Limestone County along
the Oletha and Jewett Road, which map research suggests may be the road located to the northwest
of site 41LT424 (USGS 1966). The couple and their children, including Arthur A. (4), Joe E. (2), and
Zack (3 months), lived one household away from the W.C. and Ela M. Lummus family, who also
rented their farm. W.C. and Ela Lummus's household included their three children Ethel N. (6),
Johnnie G. (2), and an unnamed infant. The group lived three households from Brack Alston, who
purchased the subject property in 1914. Brack (26) and Ella (28) Alston owned their farm, and as
insinuated by contemporary tax evidence, likely lived on a portion of the Billington Survey by 1906.
Their household included their children Minnie P. (6), Stella M. (4), Willie B. (3), Walter A. (2), and
Alvis (3 months) as well as Brack's father C.T. Alston (62). By 1920, the Alstons still lived in Precinct
6 along what was described as the Oletha and Thornton Road. This description could reference the
same road described as the Oletha to Jewett Road in the 1910 census as Thornton is located along
the same road but to the west of Oletha.

As suggested by the presence of a member of the Lummus family renting property in the vicinity of
the Allmans in 1900, it is possible that the Lummuses lived on the subject tract as tenants during its
association with the Allmans and tried to acquire it upon Joseph Allman's death. This scenario
would explain the apparent controversy regarding ownership between the members of the
Lummus family. Their residence in close proximity to the Alstons in 1910 indicates they may have
continued to live there after B.A. Alston's acquisition of the property in 1914. Additionally,
contemporary tax research (see below) indicates the Alstons lived on a portion of the Billington
Survey by 1906. The Alstons residence near the Lummuses in 1910 supports the theory that the
Lummuses may have worked as tenants on the subject property. As a result, the domestic
component of site 41LT424 could represent an occupation of the property by the Lummus family
and/or other tenants during the early twentieth century.

The Alston family, who owned acreage in the Billington Survey as early as 1895, retained the
subject property for approximately 2 years. Archival evidence indicates they also maintained some
connection to the regional pottery-manufacture industry as members of the family, including C.T.
Alston and his son B.A. Alston, are buried in the Potter's Shop Cemetery. This burial ground was
associated with the Potter's Shop kiln and contains the graves of workers and their families,
including members of the Knox and Fowler families, who both owned the business during different
periods (Unknown n.d.).

From 1895 through 1901, J.W. Alston rendered taxes on various portions of the Billington Survey.
While historians were unable to find an entry for him in the Limestone County census records,
11. NRHP Testing of Historic Site 41LT424

making his relationship to B.A. Alston unclear, he appears as a resident in the Limestone County tax rolls. In 1895 and 1896, he rendered taxes on 67 acres of the Billington Survey worth $400. The property's high value suggests it contained significant improvements or natural resources, such as a portion of the clay deposit identified at 41LT424. By 1897, his holdings had increased to 147 acres valued at $800. While it is possible that he lived on the property, he also owned land in three other surveys as well as various lots in Thornton during the period. He also rendered taxes on $1,500 worth of goods and merchandise, indicating he may have owned a store in the community. It is possible he provided clay to the Potter's Shop and/or other regional potteries and sold their wares in his store. In 1898, his holdings in the Billington Survey were reported as 107 acres valued at $800, and from 1899 through 1901, he rendered taxes on 40 acres in the Billington Survey with an average value of approximately $200.

It appears that J.W. Alston conveyed the remaining 67 acres from his 107 tract to C.T. Alston prior to 1900. In that year, C.T. Alston appears as the owner of a 67-acre tract in the Billington Survey worth $380. The property was valued at $350 the following year, and by 1902, C.T. Alston owned the entire 107 acres valued at $560. Though he owned property in other surveys in 1900 and 1901, by 1902, his holdings in the Billington Survey represented his only landholdings in Limestone County and he may have occupied the property. It is also possible that he resided in Thornton during the period, as by 1903, no members of the Alston family owned land in the Billington Survey. Instead C.T. Alston only rendered taxes on lots in Thornton.

He did not live in Thornton in 1900. In that year, C.T. Alston appears in the Limestone County census living on property he owned in an unincorporated portion of Justice Precinct 6. The record lists, Calep Alston (50) as head of a household containing his wife Estha (57), their children Nora (20), Brack (18), and Mattie E. (15), and the family of Millie Derik (44), an African American cook, which included her two children Bulah (9) and Alice (7), both of whom were identified as servants. Alston lived one household from the family of Wade Alston (26), who rented his property. It is possible Wade was Calep and Estha's son and that the family all lived on the same tract.

After 1902, no Alstons appear as owners of property in the Billington Survey in the Limestone County tax rolls until 1906. In that year, B.A. Alston rendered taxes on 39 acres of the Billington Survey valued at $195. As the tract was the only property he owned, it likely contained his homestead. Subsequent tax records suggest that both B.A. and his father C.T. Alston may have lived on the Billington Survey in the ensuing years. In 1907, C.T. Alston rendered taxes on the 39-acre tract ($110), and B.A. Alston rendered taxes on a separate 10-acre tract ($40) in the Billington Survey. The men did not own any other property, though C.T. Alston maintained livestock holdings including 60 cattle and 20 hogs. In 1908, the men continued to render taxes on their 39-acre ($225) and 10-acre ($70) parcels in the Billington Survey; however, both men had acquired additional acreage. B.A. Alston owned an additional 50 acres in the G. Duncan Survey, while his father owned 300 acres in the W.L. Ellis Survey as well as 100 acres in the J. McCristian Survey.
The men continued to render taxes on the parcels through 1909 and 1910, the last year’s tax rolls available for review, and in both years, they increased the size of their landholdings. By 1910, C.T. Alston, who lived in B.A. Alston’s household according to contemporary census records, owned a total of 677.5 acres in four surveys, and his son owned 168.5 acres in four surveys. The value of their property in the Billington Survey remained generally comparable throughout the period, but as the parcels in the Billington Survey represented the first and only property the men owned in 1907, it may have contained their homestead(s). B.A. Alston’s 1914 acquisition of the additional 152-acre subject property in the Billington Survey could fit into his documented pattern of property acquisition as represented in the tax records. He may have purchased the tract in order to expand his agricultural operation, or it could represent an attempt to initiate or expand his family’s involvement in the clay-quarrying industry. He only retained the parcel for a brief time, implying it constituted an investment of some sort.

Additionally, though the family’s relationship to the Knox/Fowler Potter’s Shop near Oletha is unclear, the fact that both B.A. Alston, his father C.T. Alston, and their families are buried in the associated cemetery suggests that one or both may have worked there or that they lived in the immediate vicinity. This evidence accompanied by their family’s longstanding association with the Billington Survey and J.W. Altson’s involvement in commercial activity indicates they maintained some connection to the regional pottery-manufacture industry during the late nineteenth and early twentieth centuries.

On December 13, 1916, B.A. and Ella Alston conveyed the now 152-acre tract to George Barnett for $1,522 cash (Limestone County Deed Records 89:3). The Alstons had purchased the 19 acres previously excluded from the tract from Jonas Allman on the same day (Limestone County Deed Records 89:5). Members of the Barnett family, who were known to employ tenants on their sizable landholdings and who were proprietors of the local general store in nearby Oletha, owned the property through 1959 (Dixon et al. 2010; Limestone County Deed Records 465:573). As they were known residents of Oletha (the family’s homestead was recorded as site 41LT440) (Dixon et al. 2010), any occupants of the property during this period would have been tenants. The P.M. Lummus family was still renting property in the vicinity in 1920, indicating they may have continued to live on the subject tract during the period. By that year, P.M. Lummus had remarried an individual named Lydia, and their household contained eight children, including Lydia’s son and daughter from a previous marriage.

Though the regional pottery-making industry was in decline by this time, it is also possible that the site continued to operate as a clay quarry during the Barnetts’ association with the property. It is unclear without additional research whether the nearby stoneware kiln at site 41LT441 was still in operation by 1916; however, a kiln is depicted in close proximity to Oletha on the 1919 Limestone County highway map (Dixon et al. 2010). As sources indicate the Pottersville kiln was closed by this time, the operation could represent site 41LT424. It is possible the Barnetts purchased the parcel containing site 41LT424 as an investment in raw materials, which they could have supplied to P.K.
McKenzie, the owner of the property containing the kiln during this period. McKenzie was the proprietor of a store in Thornton (Dixon et al. 2010), located approximately 10 miles from Oletha, and the Barnetts’ acquisition of the quarry site could provide evidence of vertical integration at a microeconomic level in which the local merchants acquired both the raw materials and the production facility(ies) in order to control the regional ceramic-production industry. The evidence also suggests that the operation may have had regional rather than just local significance as wares were transported to other commercial facilities in more-distant communities.

George Barnett was the son of W.W. Barnett. The family first appears in Limestone County census records in 1880 when W.W. Barnett was enumerated as a 23-year-old farmer living in an unincorporated portion of the county with his wife, son, and a 15-year-old farm laborer. Review of ad valorem tax data indicates Barnett continued to increase both his land and livestock holdings over the ensuing years. By 1894, Barnett’s general store appears to have been open, as contemporary tax records indicate he owned $3,500 in goods and merchandise. This is the first year he rendered taxes on merchandise. Barnett’s store was located nearby and to the east of the kiln operation (41LT441), and it is possible that Barnett sold pottery produced by the Joseph Allman and/or W.S. Roberts–controlled kiln during this period. By 1900, Barnett owned land in six local surveys, $2,000 worth of merchandise, 100 cattle, and had $2,000 cash on hand. He lived in Oletha with his nine children, including 16-year-old George, and a 22-year-old farmhand (Dixon et al. 2010).

Barnett continued to increase his holdings in ensuing years, and tax data indicate he developed interests in industrial resources. In 1905, his property, including land in seven surveys, 100 cattle, $1,500 in goods and merchandise, $1,250 in steam engines/boilers, and various unidentified town lots, was valued at $14,625. By 1910, when census records indicate his son George C. (26) worked as a salesman in his store, W.W. Barnett owned parcels in 13 surveys, $1,500 in goods and merchandise, $1,500 in steam engines/boilers, $5,000 in credit, 150 cattle, and various town lots in Thornton worth $2,000 (Dixon et al. 2010).

Census records indicate that the family continued to engage in agriculture during the period between 1880 and 1910, but by 1920, after George Barnett had acquired the parcel containing site 41LT424, they appear to have relied solely on the store for their income and/or relied on tenants to work their land. In the 1920 Limestone County census records, 63-year-old W.W. Barnett still worked as a merchant in a general store. He lived with his wife Mary Ella (57) and four of their sons including George C. (36), whom the record describes as a “surgical doctor.” The other sons all worked in the family store, including John B. (bookkeeper), Oran (or Olan) (salesman), and Cecil G. (laborer in the store) (Dixon et al. 2010). The family’s continued involvement in commercial pursuits during the period they were associated with the quarry property suggests it may have still been in use during the period.
NRHP Testing of Historic Site 41LT424

Additionally, the family's ownership of town lots in Thornton and involvement in the ranching industry imply there may have been a connection or acquaintance between the Barnetts and P.K. McKenzie, who maintained an interest in the property containing the nearby stoneware kiln recorded at site 41LT441 from 1904 through his death in 1922. Research indicates that McKenzie maintained substantial land and livestock holdings in the Oletha vicinity and was the proprietor of a store in Thornton (Dixon et al. 2010). Their common status as prominent ranchers, landowners, and general store owners in a rural portion of Limestone County suggests Barnett and McKenzie likely knew each other and may have had an economic relationship. Additionally, George's brother C.G. Barnett acquired the tract containing the kiln in 1938, further insinuating the families were economically if not personally connected (Dixon et al. 2010).

According to census records, George Barnett continued to run his father's store in Oletha through at least 1930 and likely through his death in 1932. The 1930 Limestone County census records list Barnett as a general store merchant living with his younger brother Cecil G. who worked as a salesman in the store. The pair lived near a grocer, suggesting there was more than one store in the community by that time (Dixon et al. 2010).

The subject 77.6-acre tract was set aside to E.K. Folley, Mary Earl Folley, Rebecca Evelyn Folley, and Edward Kenneth Folley, all residents of McLennan County, and Nola Maurine and Jim Smylie of Limestone County upon George Barnett's death (Limestone County Deed Records 236:457, 237:485). The group conveyed the property to Barnett's brother W.W. Barnett Jr. in 1934. Barnett Jr. paid $2,000 for a group of four tracts, including the subject parcel (Limestone County Deed Records 237:485). The tract remained part of Barnett Jr.'s estate until his death circa 1959 when his wife Laura Adra Barnett transferred it along with a group of 12 additional tracts to Frank D. and Margaret Connell (Limestone County Deed Records 465:573). Subsequent deed evidence indicates the Connell family maintained interest in a cattle company during the late twentieth century, suggesting they may have used the property as pastureland (Limestone County Deed Records 651:429).

Archival Results Summary and Analysis

Site 41LT424 fits into a regional pattern of pottery production in Limestone County during the late nineteenth and early twentieth centuries. This pattern has been explored in numerous previous studies and is represented in the variety of kiln sites distributed throughout the county, many of which are located in close proximity to site 41LT424 (see Figure 2). These include site 41LT198 (the Kimik Kiln) and 41LT11 (the Johnson-Knox-Fowler Pottery Kiln), which are located nearby, as well as site 41LT441, a small-scale kiln in nearby Oletha. Other known kilns in the county include the Louie and Douie Stone Kiln (41LT197) located near Old Union and the John Dimelow/John W. Moss kiln, the Kosse Fire Brick and Tile Company, and a potter's shop on the Betty Hohn farm, all located near Kosse. It is possible that the subject quarry site provided raw materials for one or several of these kilns during the nineteenth and early twentieth centuries, though historians only...
established potential connections with 41LT11 and 41LT441. Though it might not have operated on a daily or even a yearly basis, the archival evidence suggests that the quarry likely provided important supplemental income to its owners and facilitated the existence of a thriving pottery-manufacturing industry that characterized industrial development in Limestone County through the early twentieth century.

The history of site 41LT424 also reveals the social and economic impacts the pottery industry had on local residents as evidenced by the interrelationships it fostered. Though agriculture remained the region's predominant economic determinant, and "farmer" remained the primary way in which most individuals identified themselves, both occupationally and socially, pottery manufacture and associated auxiliary enterprises provided supplemental income and remained an important part of the economic landscape throughout the late nineteenth and early twentieth centuries. Understanding the early history of the industry's development and how local residents were involved in the enterprise demonstrates how individuals dependent upon agriculture for their livelihood exploited natural resources to expand their production beyond a subsistence level. While small-scale industrial enterprises, including the quarry and some of the kiln operations, were not always specifically documented in the archival record, they remain important components of the region's economic history.

Summary of Potential Occupants and Owners Engaged in Industrial Activity

In addition to potential connections with the regional pottery-making industry, archival research suggests that several of the owners of the property containing site 41LT424 may have resided there. Some members of the Billington family may have lived on the property prior to 1862; however, they likely lived elsewhere. Additionally, there is no evidence that they were involved in quarrying activities during their tenure of ownership. The subsequent owner, however, may have lived on the survey and engaged in clay quarrying. Benjamin Lewis appears as the property's owner in local tax rolls beginning in 1862. He did not own any other property in the area, implying the parcel contained his homestead. Nevertheless, he could have lived anywhere on the 268-acre tract and not necessarily at the subject site. The property's high value throughout his association with it and Lewis's residence in close proximity to individuals involved in pottery manufacture, including Alberry Johnson (1860) and H.H. Stephenson, Wm. C. Knox, and J.L. Stone (1870), indicate he may have maintained associations with or been involved in the early pottery-making industry in Limestone County.

Aside from the high price he paid for the property when he purchased it ($10,000), there is no additional evidence that the subsequent owner, T.C. Moore, ever occupied the subject property or engaged in quarrying; however, Mrs. Mary Runnells appears to have purchased a portion of the survey from him circa 1871. She may have lived somewhere on the Billington Survey from 1871 through 1872, though she has no apparent connection to the local ceramic industry. From 1874 to 1879, tax evidence suggests Randolph Bural may have occupied the subject parcel. It remained his
only landholding during the period, and it appears that he constructed improvements on the property shortly after acquiring it. The tract had been reduced in size to 152 acres by this time, increasing the likelihood that Bural lived near or at site 41LT424. Census evidence implies he may have engaged in clay quarrying as a supplemental economic activity during the period; however, the property's relatively low value suggests it would have been secondary to his agricultural pursuits. The Young family purchased the property in 1879, and there is no evidence that they occupied the property or any evidence that they maintained connections with the local pottery-manufacturing industry.

Historians were able to identify a direct connection between the Allman family, who owned the property containing the quarry site from 1881 through 1911, and the Stephenson family, who owned the parcel containing a kiln recorded at site 41LT441 from circa 1865 to 1905. It is unclear whether Stephenson constructed the kiln or if it was constructed after his death by his wife Hannah's associate W.S. Roberts, but Allman maintained direct connections with both men. Allman became the guardian of his brother-in-law H.H. Stephenson's children after Stephenson and his wife both died between 1890 and 1900. Following a subsequent lawsuit between the Stephenson children and W.S. Roberts, the children inherited the property containing the kiln from their parents' estate. Through his role as the children's guardian, Allman likely maintained control of their interest in the property containing site 41LT441. As a result, Allman may have been operating the kiln using the raw materials from his quarry during the late nineteenth and early twentieth centuries. Tax evidence supports this assertion as the records indicate Allman engaged in some sort of industrial activity beginning circa 1889 and maintained a commercial operation from circa 1904 through his death in 1911. Though Allman likely lived elsewhere, the parcel formed a part of his larger homestead and farm throughout his tenure of ownership, and census and tax evidence suggest that tenants, including the Lummus family, may have occupied the property during the period.

After Allman's death, members of the Lummus family, including P.M. and Lizzie Lummus and J.W. Lummus, tried to acquire the property and were associated with it through 1914. Census records indicate that they may have continued to live there as tenants after conveying the property to B.A. Alston in 1914, and it is possible that the Lummus family worked at the quarry in addition to their agricultural activities. Tax records indicate that the Alston family already lived on a portion of the Billington Survey prior to their acquisition of the subject tract. Additionally, they had a possible connection to the nearby Potter's Shop as both C.T. and B.A. Alston, as well as their families, are buried in the associated cemetery. Though the facility closed circa 1912, before B.A. Alston purchased the subject tract, the sons of J.L. Stone, the chief artisan at the facility, opened their own pottery operation around the same time. As a result, the Alstons could have purchased the property to initiate or expand an existing quarrying enterprise to supply the new Stone kiln. Regardless of the property's function when Alston owned it, his short association with the tract and occupation of an adjacent parcel suggest he purchased it as an investment.
Finally, though there is no direct evidence that the facilities continued to be used during the period, the Barnett family acquired the quarry site in 1916 and the parcel containing the kiln (41LT441) during the 1930s (Dixon et al. 2010). The Barnetts, a prominent local family engaged in farming and ranching, were also the owners of the general store in nearby Oletha, which began operating during the period the kiln and quarry site were associated with and likely operated by the Joseph Allman family. Their store continued to serve the local community through at least the 1930s, and it is possible the Barnetts sold the associated wares when the facilities were owned by others and remained involved in the local ceramic industry during the twentieth century through their acquisition of the resources.

**Additional Information Regarding Early Pottery and Brick Production in the Vicinity of Site 41LT424**

Besides the evidence provided in the primary records, the area surrounding the former quarry site is referenced in a 1936 mineral resource survey of Limestone County conducted by the Bureau of Economic Geography at The University of Texas. The document provides a brief history of the brick- and pottery-making industry in the county and discusses four primary exposures of the region’s kaolin clay deposits utilized by local artisans. The third exposure, described as “2 miles west of Oletha and 1 mile south of Pottersville,” correlates to the location of site 41LT424. The author describes the exposure as consisting of “about 4 feet of clay of a very high quality, resting upon a strata [sic] of gray sand and clay mixed” measuring “about 20 ft in thickness” (Broman 1936:3). He indicates that clay from this area was used at the Pottersville kiln, which purportedly operated from circa 1882 through circa 1911 (other sources say 1912) (Broman 1936:2). The clay may also have been used in the manufacture of bricks, and industrial census records demonstrate that there were several brickyards in operation throughout the county during the nineteenth century. The county had railroad service as early as 1869 (Maschino 2011), and wares from some of the operations may have been sold regionally rather than just locally.

A review of the Limestone County industrial census records from the nineteenth century provides information regarding additional facilities that may have used clay from the possible quarry site. Besides those inventoried in the census records, there were likely facilities that operated between census years, and the Pottersville kiln reportedly opened in 1882 and was thus not represented in available census data. Additionally, the kiln recorded at site 41LT441 does not appear in any available industrial census records (1860, 1870, or 1880), indicating it operated between those years, or more likely, after 1880. Though the information provided is limited in nature, the industrial census records provide data about the scale of local kiln operations during the period.

Though sources indicate the Alberry Johnson kiln (41LT122) was in operation as early as 1859 along the Springfield and Pottersville Road at Dooley Creek (Kotter et al. 1988), no pottery-making operations appear in the 1860 Limestone County products of industry census records. By 1870, the “stoneware factory” of Wm. C. Knox, who purportedly purchased Johnson’s kiln equipment and
relocated it to Pottersville approximately 2 miles northwest of Oletha, appears as the only pottery-making operation in the county. The facility was located in the Eutaw post office precinct, where Knox and the owners of the property containing sites 41LT424 (quarry) and 41LT441 (kiln) resided. The factory included two "turning laths," employed three full-time workers, and operated 10 months of the year. During the previous year, the facility had produced 7,000 gallons of stoneware valued at $1,400. The fact that Knox resided in immediate proximity to two consecutive owners of the possible quarry (site 41LT424) during this period suggests an economic relationship could have existed between the two operations.

This operation expanded substantially under the ownership of John Fowler, who purchased the facility sometime after 1880, when he appears as a farmer in local census records living three households from Benjamin Lewis, the owner of the property containing site 41LT424 from circa 1862 to 1870, and one household from the Richard Crews family, whose homestead was located at nearby site 41LT454 (Dixon et al. 2010). By 1900, Fowler (53) is enumerated as a manufacturer of stoneware in the Limestone County census records. In that year, his household included his wife Mary (53), his son Eugene J. (23), and two boarders, Thomas J. Bird (47) and Albert H. Collier (48). Both Eugene and Thomas Bird are listed as potters, while Collier worked as a day laborer at the pottery. Fowler died in 1910, and the shop closed circa 1912 due to a decrease in consumer demand for stoneware crockery during the period. At its peak, the facility employed as many as 60 workers. Its size and longevity, as well as the diversity and quality of its products, made the kiln unique in the region. Due to its proximity to site 41LT424 (approximately 1.25 miles northeast), it is likely that the facility acquired clay from the associated deposit on the property.

As of 1880, five brick manufacturers producing goods worth at least $500 appear in the Limestone County industrial census records. Four, including the operations of S.W. Swinburn and Sons and T.J. Farmer, both of Mexia, and N. Bishall and Irwin Houstin, whose operations were located in unincorporated areas, were small-scale operations employing an average of 8 workers and producing only common bricks. The fifth, known as the Fire Brick and Tile Company of Kosse, was a large-scale operation that produced common brick, fire brick, tile, drain pipe, and pottery. This facility employed 60 workers in its brick-making operation and approximately 33 in its pottery-making division. The pottery manufacture component of the enterprise operated 10 hours a day, 12 months a year and paid its skilled laborers $5 per day. This high wage is in sharp contrast to the daily wage of brickmakers, which averaged between $0.74 per day at some of the smaller outfits to a maximum of $3 per day. In 1880, the company's pottery products were valued at $22,000. Though there is no direct evidence that these facilities used clay from the subject parcel, they likely took advantage of locally available clay sources, including the deposit at site 41LT424.

The only other pottery producer inventoried in the 1880 Limestone County census is Lee Kimik, proprietor of the Kimik Kiln (site 41LT198), which was located near site 41LT424 in the Headsville vicinity. In contrast to the Fire Brick and Tile Company, Kimik only employed five full-time laborers at his pottery during peak production periods. As the record indicates, he had "up to" 5 employees.
Kimik likely employed fewer workers during slower times of the year. His operation was engaged in full-time production 8 months of the year and produced approximately $3,000 worth of "stone and earthen wares." He also paid his skilled workers $5 per day though unskilled laborers, who made up the majority of the workforce, would have been paid much less, likely around $1 per day.

As previously referenced, the kiln at 41LT441 and the Stone kiln near Old Union both operated after 1880 and were thus not enumerated in available industrial census records. The Stone kiln may have operated as late as 1925, and it is unknown how long the kiln at 41LT441 was in operation. As a result, it is possible that clay deposits at site 41LT424 continued to provide resources to local kiln operations well into the twentieth century.

SUMMARY AND CONCLUSIONS

Archival evidence indicates that site 41LT424 could have been associated with a domestic occupation beginning in the mid-nineteenth century by owner-occupants Benjamin Lewis (ca. 1862–1870) and Randolph Bural (1874–1878) and extending into the twentieth century with tenant occupations during the property's association with the Allman family (1881–1911) and the Alston family (1914–1916). The Lummus family may have lived on the property as tenants of both the Allman and Alston families and as owners during their brief ownership of the property between 1911 and 1914. Finally, the Barnetts owned the property from 1916 through the mid-twentieth century. As they had a known residence in the community of Oletha, any occupants during this period would have been tenants. Though some of the historic owners of the property may have been significant at a local level, site 41LT424 is not representative of that significance nor does it include deposits that can be associated with any one individual or family. Additionally, in the case of the Barnett family, it is one of several sites associated with their history and does not represent the most significant property associated with the family. As a result the site does not appear to qualify for NRHP inclusion under Criterion B.

The archival research also indicates the property containing site 41LT424 maintained industrial associations as a kaolin clay-quarrying site throughout its history. The property may have served as a clay source for local pottery manufacturers beginning in the 1860s and extending through that industry's decline in the 1920s and 1930s. Though archival research into the site's history provided additional information about the pottery-manufacturing industry and the industry's role in local economic development, the site itself does not possess the potential to provide more information about quarrying methods or those involved in the activity. Additionally, it is unlikely that additional information about the facility could be gathered from supplemental archival research as the archival research conducted during the testing phase was thorough enough to be considered mitigation level and indicated there would be little information left to learn from archival records for this site. As a result, the site does not appear to warrant NRHP inclusion under Criterion A.
Excavation at site 41LT424 demonstrated it has been negatively impacted following its industrial/farmstead abandonment and therefore has not maintained depositional integrity. The site lacks any intact structural remains. For these reasons the site does not appear to harbor significant archeological deposits that warrant NRHP inclusion under Criterion D. The historic cultural features on-site include several trash pits and what is thought to be the remains of a small surface “heap” lime kiln. The trash pits were presumably filled with trash, generally consisting of residential and farming-related materials, apparently following the site’s industrial/farmstead abandonment. Although the origins of the pits remain unknown, it is conceivable that they were related to the site’s industrial/farmstead occupation.

Site 41LT424 does not appear to be eligible for NRHP inclusion under any of the criteria for evaluation. For this reason, no further work is recommended.
NRHP TESTING OF MULTICOMPONENT SITE 41LT425

BACKGROUND

Site 41LT425 is located on a small sandy ridge rise. The edges of the ridge rise were eroded. Downslope from the site to the west is a sandstone outcropping. The elevation of the site is approximately 435 ft msl. At its nearest point to the site, Cox Creek is about 800 m to the west. The soil on-site is mapped as Edge fine sandy loam, 5 to 12 percent slopes (Griffin 1997). Soils exposed during shovel testing were yellowish brown to pale brown sandy loams extending up to 1 m or more in depth over strong brown to reddish yellow clay. The site extends 40 m east to west by 50 m north to south and covers an area of 2,000 m². Roughly the western two-thirds of the site is in an oak and elm woods with a dense understory of American beautyberry, greenbriar, and yaupon. The remaining one-third of the site is in a shortgrass pasture. The ground surface over the entire site was completely obscured by vegetation.

PREVIOUS INVESTIGATION

Site 41LT425 was located during previous survey within the Kosse Mine (Sherman and Watkins 2007). At that time 12 shovel tests were excavated to define the horizontal and vertical extent of the site. Four shovel tests were culturally positive, yielding eight fire-cracked rocks, one petrified wood abrader, one petrified wood scraper, and one piece of nondiagnostic chert debitage. All of the artifacts from shovel tests were recovered from levels 3 through 6 (30 to 60 cmbs). This work suggested the site extended roughly 50 m north-south by 40 m east-west (Figure 73).

Site 41LT425 was determined to possess an unknown National Register of Historic Places (NRHP)-eligibility status based on the results of the previous survey (Sherman and Watkins 2007), which identified a prehistoric component. During August of 2010, Atkins archeologists revisited the site and identified and recorded a historic grave marker for William E. Henson, who died in 1869.

WORK ACCOMPLISHED

This section presents the results of NRHP-eligibility testing on the portion of site 41LT425 beyond the limits of the 100-ft buffer around the marked graves, as well as preliminary archival research on the graves. Luminant intends to avoid mine-related impacts to the remainder of the site and the graves (including the buffer). If the site cannot be avoided in the future, NRHP eligibility testing would be required for remainder of the site. This would include determining if additional unmarked graves are present and compliance with Section 711 of the Texas Health and Safety Code.
Figure 73
Plan Map
Site 41LT425

Positive Shovel Test
Negative Shovel Test
100 ft Buffers
Site Boundary From Sherman & Watkins (2007)
Methods

In June 2011, Atkins initiated NRHP testing on the portion of the site outside of a 100-foot (ft) buffer around the marked burial. Upon returning to the field, a possible second marked burial was identified. The 100-ft buffer zone encompasses both graves. The portion of site 41LT425 beyond the limits of the 100-ft buffer comprised a roughly 1,200-m² area. A second buffer zone was placed around the entirety of site 41LT425 to protect the site until its overall NRHP-eligibility status can be determined.

During the current investigations additional shovel testing was conducted within the previously determined site boundaries but beyond 100 ft from the probable burial markers (see Figure 73). Additional shovel tests were excavated beyond the original site boundary around culturally positive tests. A control grid was established on-site with a hand-held compass and a 30-m tape. Pin flags were set at 10-m grid intercepts across the site. Shovel tests were excavated at 10-m grid intercepts (see Figure 73). The positions of all shovel tests were acquired with a Trimble GeoXT GPS device that obtains sub-meter accuracy with postprocessing. During the current investigation, only shovel testing was deemed necessary for the tested portion of the site. Mechanical excavation and hand unit excavation were not conducted.

Following identification of the first burial at site 41LT425, historians sought to gather more information about the Henson family, including whether they resided on the subject tract and/or whether additional family members could be buried at the site. This research was preliminary and included review of population census records and archival research conducted during previous archeological survey efforts (Sherman and Watkins 2007) and secondary history research, including review of local cemetery inventories and contextual materials available in-house and online.

Results

Nineteen shovel tests were excavated during the current investigation; three were culturally positive. Shovel Test 10 contained one piece of lithic debitage in Level 5. Shovel tests 9 and 19 contained one piece of glass each in Level 2. The piece of lithic debitage was recorded as a small chert flake but was lost in the field. The glass specimens include an aqua-tint body shard and a solarized rim shard with mold seams.

The presence of mold seams indicates production after 1830. When mold seams are present on neck/rim fragments, they indicate production after 1904 (SHA 2011). Solarized glass refers to glass that has become weathered to an amethyst color due to the presence of manganese dioxide in the glass recipe, which under prolonged exposure to ultraviolet rays such as sunlight, causes a chemical reaction that tints the glass. Although manganese has been used for centuries for its decolorizing properties in glass making, it was most commonly used from 1890 to 1920. Aqua was a very popular color in all types of jar and bottle glass from the early nineteenth century to the 1920s and...
remained common in canning jars into the 1930s. However, shades of aqua in soda bottle form are still widely produced today (SHA 2011). The two shards of glass recovered at 41LT425 likely date to the early twentieth century and are probably associated with site 41LT424, a late-nineteenth- to early-twentieth-century farmstead/industrial site located 60 m to the south.

The paucity of prehistoric cultural materials recovered during the current investigation suggests that this portion of the site represents a short-duration occupation. The absence of carbonized subsistence or spent fuel remains and fire-cracked rock suggests intact cultural features are not present in this portion of the site. These findings suggest that the portion of the site tested lacks significant data resources and therefore does not contribute to the site’s overall potential NRHP eligibility status. No additional investigation of the portion of site 41LT425 that is beyond the limits of the 100-ft buffer around the grave markers is recommended.

**Historic Cemetery**

While preparing to conduct archeological testing at site 41LT425, archeologists recorded a headstone and footstone associated with the grave of William E. Henson and a second possible grave marked with stone curbing (Figure 74). Henson’s headstone reads "WILLIAM E.- SON OF-J.A. & N.J. HENSON-BORN-OCT. 5, 1869- DIED- OCT. 16, 1869". His footstone reads "W.E.H.". The second possible grave is marked with a partial rectangular alignment of hematitic sandstone slabs. The identity of the second interred individual is unknown. Limited archival research was conducted to identify the connection between the Hensons and the subject property.

**Archival Research**

The cemetery is located within the original H. Billington Survey (Limestone County Abstract 77). Archival research indicates that the Hensons were early residents of the project vicinity and the nearby Oletha community, although their homestead was not located within the Billington Survey (Dixon et al. 2010).

Henson purchased land in the adjacent Joseph Ferguson Survey (Limestone County Abstract 194) in 1859 from patentee and early settler Joseph Ferguson. By the following year, Henson, his wife N. J. (Nancy), and their 1-year-old son J.H. lived two households from Ferguson and three households from J.Y. and E.A. Stevenson. Nancy J. Stevenson (sometimes recorded as Stephenson) Henson was the daughter of J.Y. and E.A. Stevenson, patentees of the nearby J.Y. Stephenson Survey (Limestone County Abstract 511). She lived with her parents in the area as early as 1850 when they resided one household from Joseph Ferguson. Ferguson is credited with being the founder of the Oletha community and lived in the area as early as the 1830s (Dixon et al. 2010).

The Hensons continued to live in the vicinity of the site by 1870, and tax research indicates they had acquired an additional 80 acres in the Stephenson Survey by that time. In the 1870 tax rolls, Henson rendered taxes on 160 acres in the Ferguson Survey ($200) and 80 acres in the Stevenson
Figure 74

SITE 41LT425
GRAVE MARKERS

Drawn by: S. Laurence
[sic] Survey ($400). Together, the parcels appear to have constituted their home and farm. Census records from that year list the couple as residing with their three children Jno. H. (11), Mary E. (7), and Robert M. (4), as well as Emerly J. (14) and Ay [sic] P. (8) Thomas and Peter Karnes, a Polish laborer. Henson’s age in this year is mistakenly recorded as 63, though evidence from cemetery records suggests that he was actually 33 (Dixon et al. 2010; Owens 2001a).

It is unclear why John and Nancy Henson’s infant son was buried in the nearby Billington Survey in 1869. Review of tax data and chain of title information for other tracts they were associated with suggests they never owned any property in the survey, and they did not have obvious direct connections to any of the owners of the Billington Survey listed in the tax records during the period. Nancy Henson died the following year shortly after giving birth to another son, James J. Henson. Nancy was not interred near her infant son William, but rather was buried in the nearby Ferguson Cemetery located east of Oletha (Owens 2001b). James J. Henson died in 1871 and was buried near his mother (Owens 2001c). John A. Henson remarried shortly after his wife’s death. Both he and an infant daughter from his second marriage were buried in the Ferguson Cemetery in 1878 (Owens 2001a, 2001d).

William E. Henson’s grave is marked with an elaborate stone that is similar in design to those associated with his family members interred in the Ferguson Cemetery. While it is possible that William E. Henson’s grave could have marked the first in a new cemetery, the earliest marked grave in the Ferguson Cemetery is that of Joseph Ferguson’s wife Hannah who died in 1866 (THC Historic Sites Atlas 2004), 3 years before his death. The cemetery’s existence before his death and the fact that his family is interred there makes it even more unclear why the Henson infant is buried independently in the Billington Survey. A documented yellow fever epidemic swept through the county in 1873 (Odintz 2011), and it is possible the infant died of an epidemic disease and needed to be buried quickly. It is also possible that the Ferguson Cemetery was not open to the public at the time of his death but opened shortly thereafter by the time of Nancy Henson’s death.

During intensive pedestrian survey of the area surrounding the burials, archeologists did not identify any additional marked graves; however, the possibility exists for unmarked burials. Although at present the 100-ft buffer area around the burials is being avoided by all mining-related activities, if the site cannot be avoided in the future, detailed chain of title research would be required to make more-concrete determinations about the property’s history including when or if it was ever designated as an official burial ground.

**SUMMARY AND RECOMMENDATIONS**

The paucity of prehistoric artifacts recovered during the current investigation suggests the tested portion of 41LT425 does not contribute to the site’s overall potential NRHP-eligibility status. Significant data resources that warrant NRHP inclusion do not appear to have been preserved within the tested portion of site 41LT425. The historic glass is likely associated with historic site
41LT424. No additional work is recommended for the portion of site 41LT425 tested during this investigation. The remainder of the site is being avoided by all mining-related activities. If the site cannot be avoided in the future, additional NRHP eligibility testing would be required for the remainder of the site. This would include additional shovel testing and potentially hand excavation within the portion of the prehistoric component that is within the 100-ft buffer and mechanical stripping or remote sensing or both to determine if additional burials are present within the historic cemetery. Additional archival research into the historic cemetery would also be necessary in order to evaluate the cemetery's eligibility under Section 106 of the NRHP. Furthermore, compliance with Section 711 of the Texas Health and Safety Code will also be required if the cemetery cannot be avoided.
NRHP TESTING OF HISTORIC SITE 41RT413

BACKGROUND

Site 41RT413 is a historic industrial/residential site associated with the historic Headsville community. The site is located on a gentle slope approximately 120 m east of the Willow Creek headwaters (see Figure 1). The elevation at the site center is about 490 ft msl. The site dimensions are approximately 85 m northwest-southeast by 215 m northeast-southwest (18,275 m²). The vegetation at the site consists of a dense oak and elm woods with a dense brushy understory. The vegetation limited ground surface visibility to 5 percent or less. The soils mapped on-site include Gasil loamy fine sand, Crocket loam, and Lufkin fine sandy loam, 0 to 1 percent slopes (Hyde 2007). The soil on-site is generally a dark brown sandy loam extending from 10 to 100 cm in depth below ground surface above gray-brown, to yellow, to reddish brown sandy clay.

PREVIOUS FIELD INVESTIGATION

Site 41RT413 was last visited during previous archeological survey of the Kosse Mine (Sherman and Watkins 2007). During that visit, 13 shovel tests were excavated to define the boundaries of the site. Of these, seven were culturally positive, yielding 96 artifacts. Artifacts recovered included 5 brick fragments, 2 whiteware sherds, 46 glass artifacts, 1 charcoal fragment, 3 pieces of burned clay, 1 coal clinker, 32 iron artifacts, 5 pieces of leather, and 1 unidentified metal artifact. Of the 32 iron artifacts, 18 are cut nails and 1 is a wrought nail. The remaining iron artifacts are unidentified fragments. The 46 glass artifacts include 5 aqua-tinted window glass fragments, 40 bottle fragments, and 1 container fragment. The bottle and container glass fragments include 6 amber fragments, 1 aqua fragment, 4 aqua-tinted fragments, 1 brown fragment, 14 colorless fragments, 4 dark amber fragments, 7 light blue fragments, and 4 medium amber fragments.

The artifacts recovered on-site during that visit are not particularly temporally sensitive. However, these materials do generally suggest an initial occupation beginning around 1880. The whiteware dates to the nineteenth century (Potter et al. n.d.). Cut nails were not replaced by wire nails until the last decade of the nineteenth century (Adams 2002). The presence of the former and the absence of the latter in the shovel testing assemblage strongly suggest the presumed former structures on-site were built prior to 1890. This conclusion is further strengthened by the presence of a single hand-wrought nail. Aqua bottles became uncommon after the 1920s (SHA 2011). The presence of fragments from aqua glass bottles suggests the occupation of the site predates the 1920s.
CATTLE DIPPING

In 1906 the Bureau of Animal Industry led a campaign to eradicate the cattle tick in the southern states. The cattle tick was responsible for spreading disease amongst cattle herds such as "Texas fever," which caused weight loss, reduced milk production, and death. The method that became favored for tick eradication was arsenical dips. This involved completely immersing the cattle in an arsenic solution contained in a dipping vat. To construct the vat, a long, narrow pit was excavated and lined with concrete to prevent leaking of the dipping solution. The entrance to the vat consisted of a poured-concrete chute that terminated at a slide into the vat. The exit from the vat consisted of either a slope or stairs that led onto a poured-concrete draining pen. The sides of the chute and draining pen were constructed of wood. The pen was divided down the middle and gently sloped to allow the excess solution dripping off the cattle to drain back towards the vat or into a settling tank (Graybill 1912:5–6, 27, 38; Hope 205:5, 13; U.S. Department of Agriculture [USDA] 1912:27). The ticks carrying "Texas Fever" were eradicated in the United States by 1943, except along the Texas-Mexico border, where the USDA still maintains 40 dipping vats (Texas Animal Health Commission n.d.).

ARCHIVAL RESEARCH

The tract containing site 41RT413 includes four separate 1-acre parcels with distinct histories within the former community of Headsville. When conducting archival research as part of the intensive survey (Sherman and Watkins 2007), historians relied solely upon chain of title data provided by Luminant. Unfortunately, the chain of title information for the subject tracts was incomplete and provided limited information about their history. In 1878, the parcels were partitioned from a 150-acre tract owned by the Alston family. The Alstons, who had extensive landholdings in the area, could not be definitively tied to the site.

After their original partition, the parcels changed hands frequently during the late nineteenth century, and records suggest that they were used for commercial and/or industrial purposes. Numerous individuals were associated with the parcels during the period, and they had separate histories between 1878 and 1908 when the William Box and Son Partnership owned three of the four tracts. Box acquired one of the 1-acre parcels from the D. June Machinery Company in 1908. As the artifacts recovered from this site seem to indicate it was industrial, at least in part, it may have been associated with this tract.

Archival research conducted as part of the current investigation has helped to clarify the history of two of the 1-acre parcels and document the former presence of a gin or mill on one of these tracts and a residence/commercial operation on another tract during the late nineteenth to early twentieth century.
Tract Containing the Mill/Gin Foundation and Cattle Dipping Vat

The gin and mill are first referenced in relationship to the subject tract in an 1887 conveyance of the property by T.J. Groce of Galveston County to J.P. Truett, W.A. Breed, and J.D. Faircloth. The deed indicates that in addition to the 2 acres of land, Groce was conveying a steam engine, boiler, belting, shafting and machinery, a mill, and two gin stands, excluding a Winship gin stand and cotton press that were located on the property (Robertson County Deed Records 20:371). Groce had purchased the property jointly with his partner E.S. Juneson at a Sheriff's Auction in 1885 (Robertson County Deed Records 14:247), and that deed does not reference any improvements.

By 1906, J.P. Truett, who appears as a merchant living in Headsville in the 1900 Robertson County census, owned all interest in the property. In that year, he conveyed an acre containing the mill, etc. to J.P. Dubose, a resident of Robertson County. Dubose, who was also the proprietor of a general store, went bankrupt the following year. The “1-acre gin lot,” including “gin stands, engine, boiler, press house and all gin machinery,” were listed in a 1907 inventory of his estate in which he conveyed both to a trustee to sell in order to satisfy his debts (Robertson County Deed Records 50:304). The 1907 record does not mention the mill. The property was acquired by the D. June Machinery Company of Waco, who manufactured gin parts (Robertson County Deed Records 50:474). The machinery company sold the land to the William Box and Son partnership in exchange for cash and some timberland the partnership maintained in Limestone County. The fact that the grantees owned timberland in the vicinity suggests they may have continued to operate the mill during their tenure of ownership (1908–1910). As suggested by the records, the gin/mill likely operated from circa 1887 through circa 1910 when the property was purchased by Walter Harper (along with two other tracts) for $37 (Robertson County Deed Records 61:83). The extremely low price suggests that the machinery was no longer on the parcel by this time.

Tract Containing the Residential/Commercial Component

In an 1879 deed, the 1-acre tract containing the residential/commercial component was described as a lot containing the home and store of S.M. and N.A. Holmes. Samuel and Nancy Holmes appear in the 1880 Limestone County census, and he worked as a merchant. The property was purchased by J.R. Adams and W.S. Bryan (Robertson County Deed Records 75:427), and it appears that they leased out the dwelling on the property. In 1881, the pair conveyed the property to R.A. St John, and the deed indicates St. John lived there at the time (Robertson County Deed Records 75:429). There is a small gap in the deed record after this period, but by 1882, W.S. Bryan had reacquired the property. In that year, he conveyed it to V.N. Adams, the second wife/widow of J.R. Adams (Robertson County Deed Records 75:428). Census evidence (and information gathered during archival research into the Adams homestead, site 41RT367) suggests that she may have lived on the property after his death (1888–1907). It is unclear what happened to the store on the property, though the Adams family was associated with a store located on the Limestone County side of the community.
NRHP TESTING FIELDWORK

Horizontal Control

Due to the dense vegetation on-site, a 20-m grid was established with a compass and 30-m tape. The locations of all shovel tests, trenches, and excavation units (Figure 75) were recorded with a Trimble hand-held GPS unit that is accurate to within 1 m with postprocessing.

Shovel Testing

Initially, shovel testing was conducted at 20-m grid intercepts across the site. Areas where shovel testing yielded high artifact density and/or diversity were subjected to intensive shovel testing at 10-m grid intercepts. A total of 71 shovel tests were excavated to determine the vertical and horizontal limits of the site and assess clinal variation of the cultural materials present. Of these shovel tests, 35 were culturally positive, yielding 599.91 g of handmade bricks, 85.19 g of machine-made bricks, 602.84 g of mortar, 9 ironstone sherds, 1 semiporcelain sherd, 2 stoneware sherds, 0.19 g of charcoal, 1 indeterminate glass shard, 22 bottle glass shards, 41 vessel glass shards, 9 window glass shards, 4 barbed wire fragments, 2 iron bolts, 5 fragments of cast iron, 16 unidentified iron fragments and objects, 1 drawn iron fragment, 39 cut nails, 10 wire nails, 1 fragment from an iron vessel, 1 lead fragment, and 7 pieces of unidentified rubber.

During this phase of investigation, the surface features representing the site's industrial components, including the anchor bolts protruding above the ground from the partially buried sawmill/gin foundation, the associated brick scatter, the mill pond, and the dipping vat entrance and exit slabs were recorded. The surface features associated with the residential/commercial component, including the surface scatter of bricks and glass and the push pile with bricks, were also recorded. Additionally, an isolated scatter of modern machine-made bricks was identified on the southern margin of the site, adjacent to a fenceline and open pasture. This modern brick scatter is thought to represent recent discard not associated with the identified historic components and was not sampled.

Horizontal Distribution of Cultural Materials

Shovel testing demonstrated that artifacts were unevenly distributed across the site and that the distribution of various artifact classes also differed. Figure 76 presents artifact density by material type. Handmade bricks were recovered primarily from two separate concentrations, one located on the eastern limits of the site, within the residential/commercial component, and one located on the western limits of the site, within the sawmill/gin site component. Machine-made bricks were recovered primarily from one concentration located in the west central portion of the site adjacent to the cattle dipping vat. Metal artifacts were recovered from across the site in separate concentrations consistent with the scatters of handmade and machine-made bricks. The densest
concentration of metal artifacts, however, was recovered in association with the single machine-made brick concentration near the cattle dipping vat. Glass artifacts were widely distributed across the site but occurred in concentrations generally consistent with concentrations of other artifact classes. Ceramic artifacts were recovered in the greatest frequency from the eastern portion of the site in the vicinity of the residential/commercial site component.

**Mechanical Excavation**

A backhoe with a smooth blade affixed to the bucket was used to excavate seven backhoe trenches and two backhoe scrapes to prospect for features. Trenches and scrapes were placed in areas of high artifact density and where surface indications of a possible feature were identified. After excavation, the walls of each trench and the floors of each scrape were troweled smooth in an effort to identify cultural features. Four historic features, including the sawmill/gin foundation, were exposed as a result of this work (see Figure 75).

**Hand Excavation**

Hand-excavated units were used to gather data from cultural features identified through mechanical excavation. All sediment removed by hand excavation was screened using ½-inch (0.635-cm)-mesh hardware cloth. A total of three hand-excavation units were used to sample three historic features at 41RT413. A hand unit was not excavated to sample the cattle dipping vat (Feature 4) due to the presumed presence of toxic chemicals from the dipping solution.

**Feature 4, Trenches 1 and 4, Scrapes 1 and 2**

Feature 4 (Figure 77) represents the remains of a livestock dipping vat that was first identified by the presence of two concrete slabs, visible on the ground surface, forming an entrance and an exit to the vat. The entrance slab is flat, approximately 0.7 m wide and 4 m long, with a partial row of concrete blocks lining the south side. It is possible that a second row of concrete blocks once lined the north side and the blocks have been displaced since the site was abandoned. The exit slab is located in line with and approximately 7.75 m west-southwest of the entrance slab. It is approximately 1.8 m wide, 10.35 m long, slightly concave along its length, and slopes gently (at an approximate 4 percent grade) west-southwest towards the vat. Both slabs are cracked and slightly warped. The entrance slab is broken into five sections. The easternmost section slopes steeply (at an approximate 48 degree grade) to the north-northeast. Two wooden posts were also identified protruding from the ground between the two slabs. Holes approximately 10 cm by 5 cm, presumably to support posts for a divider, were located along the centerline of the exit slab. At least two sets of human footprints are imprinted in the west end of this slab, one of which appears to be from a child.
SITE 41RT413
FEATURE 4
PLAN VIEW

Figure 77

Wooden Post
Topographic Contour
Trench 1 (Figure 78) was excavated between the dipping vat entrance and exit slabs and perpendicular to their longitudinal axes. Trench 1 was approximately 3 m long, 2 m wide, and excavated to a depth of roughly 180 cmbs (at the center of the trench) and revealed the outlines of a collapsed and in-filled livestock dipping vat (Feature 4) in cross section. Once the presence of the dipping vat was confirmed, the trench was not entered by archeologists and was observed and recorded from the sides. The tank was loosely filled in with concrete and mortar rubble with degraded wood along the center. At the bottom of the feature in the southwest wall of Trench 1, below a line of degraded wood, is a solid yellow wood board thought to represent modern plywood.

The concrete rubble and mortar that compose the majority of the fill of Feature 4 are thought to represent the collapsed remains of the vat facing (F1 on Figure 78). The degraded wood (F2 on Figure 78) and the yellow plywood (F3 on Figure 78) were found intermixed with the concrete rubble, suggesting they became incorporated with the archeological record following the use-life of the dipping vat, perhaps when the tank was in-filled. The degraded wood may represent a wooden cover for the dipping vat to keep people and animals from falling into the vat. Based on the depth of the bottom of the feature as expressed in the southwest and northeast walls of Trench 1, the bottom of the tank slopes at an approximate grade of 44 percent (towards the pond to the west).

In profile (see Figure 78), the soil surrounding the in-filled vat appears to have been altered as a result of the excavation, use, and destruction of the dipping vat. Soil zone 1 is a 10YR 4/3 brown sandy clay mottled with 2.5Y 5/4 light olive brown clay. This zone overlies Feature 4 and likely was deposited there via heavy machinery after the tank was abandoned, possibly when it was in-filled. Below this are intervening thinly bedded zones of light (zones II, 10YR 5/3, and IV, 10YR 5/4) silty and loamy sand and dark (Zone III, 10YR 4/2) organically rich loamy fine sand above dark olive brown (Zone V, 2.5Y 3/3, and Zone 6, 5Y 5/4) clay. Conceivably the organic component of the soil became incorporated into the archeological record as a result of tank use, maintenance, and cleaning.

A representative sample of the artifacts observed during excavation of Trench 1 was recovered from the backdirt. These materials are listed in Table 56.

Trench 4 was placed on a slight rise to the north of the dipping tank. It was approximately 3.5 m long, 1 m wide, and was excavated to an average depth of 80 cmbs, where the clay horizon was encountered. No artifacts were observed in this trench. The composition of this trench indicates that the rise likely represents fill from the original excavation of the tank. The profile of Trench 4 (Figure 79) appears disturbed, with 7.5YR 5/6 yellowish red clay mottled with 10YR 4/2 dark grayish brown clay at the surface extending to roughly 40 cmbs. This was underlain by a 10YR 5/4 yellowish brown clay that extended in depth to roughly 50 cmbs. This stratum was underlain by an undisturbed E horizon stratum of 10YR 4/4 dark yellowish brown silty loam that had been truncated in places by a deposit of 7.5YR 4/2 brown clay. The 10YR 5/6 yellowish brown clay Bt horizon was encountered at roughly 70 to 75 cmbs.
I  10YR 4/3 brown sandy clay mottled with 2.5Y 5/4 light olive brown clay
II  10YR 5/3 brown silty sand with few fine roots
III  10YR 4/2 dark grayish brown loamy sand with no roots
IV  10YR 5/4 yellowish brown loamy sand
V  2.5Y 3/3 dark olive brown clay
VI  5Y 5/4 olive dense clay
F1  Feature 4, 2.5Y 4/3 olive brown sandy clay many small and fine roots
F2  Feature 4, 10YR 3/2 very dark grayish brown degraded wood
F3  Yellow plywood

Wooden post
Concrete and mortar rubble

0 100 centimeters

Figure 78
SITE 41RT413
FEATURE 4 PROFILE, TRENCH 2
SOUTHWEST WALL

Drawn by S. Laurence
Table 56: Site 41RT413, Trench 1 Cultural Materials

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handmade Bricks</td>
<td>–</td>
<td>200</td>
</tr>
<tr>
<td>Glass Vessel Fragment</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Cast Iron Bearing Housing</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Iron Bolt</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Iron Handle</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Iron Horse Bit Ring</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Iron Horseshoe</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Cast Iron Fragment</td>
<td>2</td>
<td>–</td>
</tr>
<tr>
<td>Cut Nails</td>
<td>23</td>
<td>–</td>
</tr>
<tr>
<td>Iron Pipe</td>
<td>3</td>
<td>–</td>
</tr>
<tr>
<td>Iron Strapping</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Threaded Iron Pipe</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Cast Iron Pulley Wheel</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>41</td>
<td>200</td>
</tr>
</tbody>
</table>

Scrape 1 (see Figure 77) was excavated to the north of the entranceway slab and tank to prospect for any possible architectural remains (such as postholes or foundation remnants) from a potential structure associated with the livestock dipping vat (Feature 4). Scrape 1 extended 5 m by 3.2 m, with the long axis oriented northwest to southeast. No indications of posts or other architectural remains were located in Scrape 1.

Scrape 2 (see Figure 77) was excavated to the north of the exit slab to prospect for the remains of a drain to direct the runoff from this slab to a silt trap. The breadth of Scrape 2 was limited by dense vegetation. It was 3 m by 1.2 m, with the long axis oriented northwest to southeast. The remains of a drain were not located in Scrape 2.

**Feature 1, Trench 2, Unit 1**

Feature 1 was initially identified by the presence of seven anchor bolts (occurring in two rows) protruding approximately 25–30 cm above the ground surface at the eastern edge of the pond. The area between the two rows of anchor bolts was cleared by hand of leaf litter and pine duff revealing a foundation formed from handmade bricks and mortar.

**Trench 2** (Figure 80) was placed parallel to and just east of the foundation. The trench was approximately 4.2 m long by 1 m wide. It was excavated to an average depth of 90 cmbs. Three soil zones were identified in the west wall of the trench. Zone I extended from the ground surface to an average depth of about 60 cmbs and consisted of a 7.5YR 4/1 dark gray clay with numerous fragments of degraded bricks and mortar, as well as several metal artifacts. This was underlain by
I  7.5YR 5/6 yellowish red clay mottled with 10YR 4/2 dark grayish brown clay
II  10YR 5/4 yellowish brown clay
III  7.5YR 4/2 brown clay
IV  10YR 4/4 dark yellowish brown silty loam
V  10YR 5/6 yellowish brown mottled clay

ATKINS

Figure 79
SITE 41RT413
TRENCH 4
SOUTHWEST WALL PROFILE

Drawn by S. Laurence
I  7.5YR 4/1 dark gray clay  
II  10YR 6/2 light brownish gray silty loam  
III  10YR 4/2 dark grayish brown clay
Zone II, a 10YR 6/2 light brownish gray silty loam containing not only brick and mortar fragments, but numerous large iron artifacts, including a sash saw blade and various machinery parts. The concentration of cultural materials in Zone II was limited to a 210-cm-long area along the west wall of the trench. Zone III was found to underlay Zone II, south of the concentration of cultural materials observed in Zone II. Zone III was a 10YR 4/2 dark grayish brown clay that extended to an unknown depth below Zone II.

A representative sample of the artifacts observed in Trench 2 was recovered. These materials are listed in Table 57.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handmade Brick Fragments</td>
<td>-</td>
<td>3,340</td>
</tr>
<tr>
<td>Embossed Glass Jar Fragment</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Iron Bolt</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron Gear Fragment</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron Fragments</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Iron Fragments</td>
<td>-</td>
<td>380</td>
</tr>
<tr>
<td>Cast Iron Lid</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron “Meat” Hook</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Iron Mounting Strap</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Cut Nail</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Pipe</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Iron Tri-foil Cross Section</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron Wheel Cover</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron Pulley Wheel</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>Cast Iron Wrench</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
<td><strong>3,720</strong></td>
</tr>
</tbody>
</table>

**Unit 1** was excavated to further expose Feature 1 (Figure 81) and obtained a representative sample of artifacts associated with it. It extended 2 m by 1 m and was excavated to a depth of 93 cmbs. The artifacts recovered from Unit 1 are listed in Table 58.

Excavation of Unit 1 revealed that Feature 1 was composed of a handmade brick foundation at least 10 courses high and at least 8 rows wide, with additional rows extending to the south and the possibility of additional courses below the depth of excavation. The northern rows of bricks of the upper 6 courses appear to have degraded in place, leaving their impression in the mortar and creating a pocket of large and small brick and mortar fragments. Once the top of the foundation was
Table 58: Site 41RT413, Unit 1 Cultural Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast Iron, Indeterminate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Metal, Indeterminate</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Rebar</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Brass Shot Shell</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Brass, Indeterminate</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Brass Washer</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Handmade Brick</td>
<td>–</td>
<td>30,828.31</td>
</tr>
<tr>
<td>Machine-made Brick</td>
<td>–</td>
<td>668.63</td>
</tr>
<tr>
<td>Charcoal</td>
<td>3</td>
<td>9.83</td>
</tr>
<tr>
<td>Copper Wire</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Copper Rivet</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Bottle Glass</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Vessel Glass</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Hematitic Sandstone Cut Block</td>
<td>–</td>
<td>402.82</td>
</tr>
<tr>
<td>Iron Bearing Housing</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cut bolt, Iron</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Fastener, Iron</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Fence Staple, Iron</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Cast Iron Gear Fragment</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Eccentric Gear Fragment</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron Guides</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Iron Bridle Buckle</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cast Iron Fragment</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Iron, Indeterminate</td>
<td>32</td>
<td>2,242.81</td>
</tr>
<tr>
<td>Chain Link</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mounting Plate for Axle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Cut Nail</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>Nail, Indeterminate</td>
<td>2</td>
<td></td>
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<tr>
<td>Iron Rod</td>
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<td></td>
</tr>
<tr>
<td>Sash Saw Blade</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron Screw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron Strapping</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Iron Strapping with Staples</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Iron Threaded Pipe</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Iron Tri-foil Cross Section</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Iron Vessel</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Iron Wire</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Lead, Cast, Indeterminate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lead, Indeterminate</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Mortar</td>
<td>–</td>
<td>19,834.52</td>
</tr>
<tr>
<td>Totals</td>
<td>201</td>
<td>53,986.92</td>
</tr>
</tbody>
</table>
exposed in the unit, a total of eight anchor bolts were identified protruding from its surface, one of which was broken off at approximately 40 cmbs. The anchor bolts are approximately 2.5 cm in diameter. At the top of five of the bolts were hexagonal nuts roughly 4.5 cm across.

Three soil zones were identified in the south wall profile of Unit 1 (Figure 82). Zone 1 extended from 26 to 65 cmbs and was a 7.5YR 4/1 dark gray clay with a concentration of small brick and mortar fragments. Zone II was located to the west of Zone I and extended from 20 to roughly 56 cmbs and was also a 7.5YR 4/1 dark gray clay with a dense concentration of large brick and mortar fragments. These were underlain by Zone III, a 10YR 4/2 dark grayish brown loamy fine sand with a dense concentration of small brick and mortar fragments as well as a concentration of ash and charcoal flecks and chunks. A dense concentration of large metal artifacts, most of which appeared to be machinery parts, was encountered in both zones I and III from roughly 30 to 93 cmbs.

Feature 2, Trench 3, Unit 2

Trench 3 was excavated within the brick scatter located at the eastern edge of the pond. Trench 3 was approximately 8.7 m long by 1 m wide and excavated to an average depth of approximately 50 cmbs at the east end and up to 90 cmbs at the west end. At the east end, excavation was halted when an intact line of bricks and cut hematitic sandstone blocks, thought to represent a portion of a structure foundation (Feature 2), were exposed (Figure 83). Trenching at the west end was halted when the clay horizon was encountered. A rubber boot heel was recovered during excavation of Trench 3.

Unit 2 was excavated to further expose Feature 2. Unit 2 extended 1 m by 1 m and was excavated to a depth of 70 cmbs. After excavation of Trench 3 and Unit 2, the relationship between features 1 and 2 remains uncertain. These foundation remnants may represent two distinct but related structures or a single structure. The artifacts recovered from Unit 2 are presented in Table 59.

<table>
<thead>
<tr>
<th>Table 59: Site 41RT413, Unit 2 Cultural Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Handmade Brick</td>
</tr>
<tr>
<td>Ironstone Sherd</td>
</tr>
<tr>
<td>Bottle Glass</td>
</tr>
<tr>
<td>Vessel Glass</td>
</tr>
<tr>
<td>Cut Hematitic Sandstone Block</td>
</tr>
<tr>
<td>Iron, Indeterminate</td>
</tr>
<tr>
<td>Cut Nail</td>
</tr>
<tr>
<td>Mortar</td>
</tr>
<tr>
<td>Totals</td>
</tr>
</tbody>
</table>
I 7.5YR 4/1 dark gray clay
II 7.5YR 4/1 dark gray clay
III 10YR 4/2 dark grayish brown silty loam
An alignment of 11 bricks was exposed in both Trench 3 and Unit 2 (see Figure 83) oriented from the southwest to the northeast. The bricks are 12 inches long and mortared together at least two courses deep. The surface of one of the bricks was glazed. A series of cut hematitic sandstone blocks was located west of the line of bricks that appears to represent a portion of a foundation. A zone of ash with flecks of charcoal and burned brick fragments was located immediately above and surrounding the line of bricks and hematitic sandstone blocks.

Five soil zones were identified in the south wall profile of Unit 2 (Figure 84). Zone I extended from the ground surface to about 40 cmbs and was a 10YR 3/1 very dark gray clay with large roots. This was underlain by Zone II, which extended to around 60 cmbs and was a 10YR 6/3 pale brown silty loam with large roots. The underlying Zone III was limited to the eastern half of the profile and was a 7.5YR 4/3 brown silty loam with few fine roots. This was directly underlain by Zone IV, which was also limited to the eastern half of the unit, and was a 10YR 6/3 pale brown silt with ash and no roots. This was underlain by Zone V, which was a 10YR 4/1 dark gray clay with fine to small roots. Zones III–V were all truncated in the western half of the unit by sandstone blocks.

**Feature 3, Trench 5, Unit 3**

Trench 5 (Figure 85) was excavated to sample the brick and glass scatter in the residential/commercial component at the east end of the site. Trench 5 was approximately 4 m long by 1.5 m wide. It was excavated to an average depth of approximately 37 cmbs where the clay Bt horizon was encountered. A lens composed of brick and mortar fragments (Feature 3) was encountered in both the east and west walls of the trench at an average depth of 15 cmbs. This lens extended approximately 1.8 m along the length of the trench with an average thickness of approximately 15 cm. Four soil zones were identified in the east wall of Trench 5. Zone 1 extended from the ground surface to between 10 and 25 cmbs. Zone I was a 7.5YR 2.5/2 very dark brown silty loam. This was underlain by Zone II, which extended from the base of the above zone to an unknown depth and consisted of 7.5YR 3/3 dark brown silty loam. Zone II was truncated by Zone III (Feature 3), which was a 10YR 5/4 yellowish brown silty loam with a dense concentration of brick and mortar fragments that extended from the base of the above to an average depth of 35 cmbs. The underlying Zone IV was a 5YR 5/8 yellowish red clay that extended from the base of the above to an unknown depth.

Unit 3, a 1-m by 1-m unit, was excavated to further expose Feature 3 and determine whether this lens represented an intact brick surface. Unit 3 was excavated to a depth of 33 cmbs. It was placed adjacent to the east wall of Trench 5 above Feature 3. The cultural materials recovered from Unit 3 are presented in Table 60 below.
I  10YR 3/1 very dark gray clay with large roots
II  10YR 6/3 pale brown silty loam with large roots
III  7.5YR 4/3 brown silty loam with few fine roots
IV  10YR 6/3 pale brown silt with ash and no roots
V  10YR 4/1 dark gray clay with fine to small roots

Figure 84
SITE 41RT413
UNIT 2
SOUTH WALL PROFILE

Drawn by: S. Laurence
Brick and Mortar Lens (Feature 3)

I  7.5YR 2.5/2 very dark brown silty loam
II 7.5YR 3/3 dark brown silty loam
III 10YR 5/4 yellowish brown silty loam
IV 5YR 5/8 yellowish red clay
Table 60: Site 41RT413, Unit 3 Cultural Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Mass (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handmade Brick</td>
<td>–</td>
<td>4,779.94</td>
</tr>
<tr>
<td>Bottle Glass</td>
<td>3</td>
<td>–</td>
</tr>
<tr>
<td>Vessel Glass</td>
<td>5</td>
<td>–</td>
</tr>
<tr>
<td>Window Glass</td>
<td>12</td>
<td>–</td>
</tr>
<tr>
<td>Cut Hematitic Sandstone Block</td>
<td>–</td>
<td>9.9</td>
</tr>
<tr>
<td>Cut Nail</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Mortar</td>
<td>–</td>
<td>145.56</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>21</td>
<td>4,935.40</td>
</tr>
</tbody>
</table>

Once the brick and mortar lens was exposed (Figure 86) in the unit, it was revealed to be disarticulated and not part of an intact surface or foundation. The presence of several glazed brick fragments suggests that Feature 3 could represent the remains of a collapsed and secondarily deposited chimney or hearth.

**Trenches 6, 7, and 8**

**Trench 6** (Figure 87) was excavated to sample the push pile at the east end of the site. Trench 6 was approximately 3.8 m long by 1 m wide. It was excavated to an average depth of approximately 52 cmbs where the clay horizon was encountered. No cultural features were identified within Trench 6. Four soil zones were identified in the west wall profile of Trench 6. Zone I extended from the ground surface to an average depth of 15 cmbs. This zone was a 10YR 4/3 brown silty sand with many small fine roots. Zone I was the push pile. Zone II extended from the base of Zone I to an average depth of 40 cmbs. Zone II was a 10YR 5/3 brown silty sand with fine roots and is the A horizon. The E horizon, Zone III, extended from the base of the above to about 50 cmbs. It was a 10YR 3/4 dark yellowish brown sand with few fine roots. This was underlain by Zone IV, a 10YR 5/4 yellowish brown sandy clay Bt horizon.

**Trench 7** (Figure 88) was excavated to establish the eastern site boundary in an area with very dense vegetation. Trench 7 was approximately 3.5 m long by 1 m wide. It was excavated to an average depth of approximately 70 cmbs, where the clay Bt horizon was encountered. No artifacts or cultural features were identified within Trench 7. Four soil zones were identified in the northwest wall of Trench 7. Zone I extended from the ground surface to an average depth of 35 cmbs and was a 10YR 4/4 dark yellowish brown sandy loam. Zone II extended from the base of the above zone to an average depth of 55 cmbs and was a 10YR 5/4 yellowish brown sandy loam. Zone III extended from the base of the above to an average depth of 70 cmbs and was a 10YR 6/6 brownish yellow sandy loam. The underlying Zone IV was a 10YR 5/6 yellowish brown sandy clay Bt horizon that extended from the base of the above to an unknown depth.
Figure 86
SITE 41RT413
UNIT 3
PLAN VIEW

Drawn by: S. Laurence
I 10YR 4/3 brown silty sand with many small fine roots (push pile)
II 10YR 5/3 brown silty sand with fine roots
III 10YR 3/4 dark yellowish brown sand with few fine roots
IV 10YR 5/4 yellowish brown sandy clay with no roots
I  10YR 4/4 dark yellowish brown sandy loam
II 10YR 5/4 yellowish brown sandy loam
III 10YR 6/6 brownish yellow sandy loam
IV 10YR 5/6 yellowish brown sandy clay
Trench 8 (Figure 89) was excavated to establish the eastern site boundary in an area with very dense vegetation. Trench 8 was approximately 4 m long by 1 m wide. It was excavated to an average depth of approximately 58 cmbs where the clay horizon was encountered. No cultural materials or features were identified within Trench 8. Three soil zones were identified in the east wall profile of Trench 8. Zone I extended from the ground surface to an average depth of 37 cmbs and was a 10YR 4/3 brown silty sand with many small fine roots. Zone II extended from base of the above zone to an average depth of 50 cmbs and was a 10YR 5/3 brown silty sand with fine roots. Zone III extended from the base of the above to an unknown depth and was a 10YR 5/4 yellowish brown sandy clay.

DISCUSSION AND RECOMMENDATIONS

Site 41RT413 resulted from both industrial and residential/commercial occupations. Two industrial components were identified in the western half of the site, represented first by the remains of a livestock dipping vat and second by a handmade brick and mortar sawmill/gin foundation that appears to be largely intact. The sawmill/gin foundation is adjacent to a small pond, presumably once used to store uncut logs. The residential/commercial occupation is in the eastern half of the site and consists of a disarticulated brick feature, a brick and glass scatter, and a push pile with bricks.

The horizontal distribution of artifacts across the site is consistent with the three distinct components identified. Ceramic and glass artifacts were recovered in their greatest frequencies from the residential/commercial component on the eastern half of the site. Handmade bricks were recovered primarily from the sawmill/gin component and the residential/commercial component, while machine-made bricks were recovered almost exclusively from the cattle dipping vat component.

Archival research has confirmed the presence of a sawmill and/or gin on-site as well as a commercial/residential component. The commercial/residential component appears to have been heavily disturbed and is completely lacking in depositional integrity. This component does not harbor significant data and does not contribute to the site’s overall NRHP eligibility status. No further investigation of this component is warranted or recommended. Although the NRHP eligibility status of the cattle dipping vat remains unknown, due to its presumed contamination, no further investigation of it is recommended. The remains of the sawmill/gin do appear to meet the criteria warranting NRHP inclusion (Martin 2011).
I 10YR 4/3 brown silty sand with many small fine roots
II 10YR 5/3 brown silty sand with fine roots
III 10YR 5/4 yellowish brown sandy clay with no roots
RESEARCH QUESTIONS, RESULTS SUMMARY, AND RECOMMENDATIONS

This chapter provides a summary of the results of testing, provides site-specific recommendations, and attempts to answer the research questions set out prior to the initiation of fieldwork in a research design (Sherman and Harris 2010). The results of testing at the prehistoric sites is presented first, followed by the results of testing at the historic sites.

PREHISTORIC SITES: RESEARCH QUESTIONS

Four research questions were proposed to guide the investigation at prehistoric sites 41LT56, 41LT310, 41LT387, 41LT397, 41LT415, 41LT422, and 41LT425.

1) Is behaviorally interpretable patterning present on-site?

Horizontally isolable subsite areas were defined at sites 41LT56, 41LT310, and 41LT387 based on the distribution of cultural materials revealed through shovel testing. Three artifact high density and diversity areas were identified at both sites 41LT56 and 41LT387. One artifact high density and diversity area as well as one lithic debitage high density area were identified at 41LT310. The subsite areas identified at these sites presumably resulted from multiple site occupations. The largest of the subsite areas at sites 41LT56 and 41LT387 also likely resulted from multiple occupations.

Cultural features with scant subsistence and spent fuel remains were identified within the largest subsite areas at 41LT56 and 41LT387.

These subsite areas also demonstrated the highest level of artifact diversity and density of any of the sites and subsite areas sampled during the current investigation. A small assemblage of tools was found in association with features 2, 3, and 6 at 41LT387 as well as with features 2, 4, 5, 7, 13, and 16 at 41LT56. Ground stone was by far the most common tool type and accounts for 65 percent (n = 13) of the 41LT56 feature tool assemblage and just over 71 percent (n = 5) of the 41LT387 feature tool assemblage. Other tool types found in association with these features include utilized flakes, bifaces, and dart points. Only one temporally diagnostic tool, a heavily reworked Gary dart point, was recovered in association with a feature (Feature 5 at 41LT56).
14. Research Questions, Results Summary, and Recommendations

The largest subsite areas at 41LT56 and 41LT387 appear to have resulted in large part from processing subsistence resources, namely hickory nuts, using rock-lined hearths and roasting pits. The paucity of other subsistence remains may, however, be due more to differential preservation than systemic human behavior. No evidence of diachronic changes in site function were obtained at these sites. Presumably the Late Prehistoric occupants returned to these areas to harvest and process key resources and potentially, for temporary residence, in more or less the same way as their Archaic predecessors.

At sites 41LT397, 41LT415, 41LT422, and 41LT425, spatially isolable components were not defined based on the horizontal and vertical distribution of cultural materials across them. The first three of these sites are thought to have arisen primarily as a result of a single prehistoric occupation. The prehistoric component at 41LT425 is, likewise, thought to have resulted largely from a single short-duration occupation.

2) Have the sites maintained depositional integrity? Are intact or interpretable cultural features present?

Relatively intact and interpretable cultural features were identified and sampled at sites 41LT56 and 41LT387. Nine burned rock features were excavated at 41LT56, and six were excavated at 41LT387. No cultural features were identified at the remaining four prehistoric sites. Four features at site 41LT56 and three features at site 41LT387 yielded a scant amount of preserved subsistence remains and/or wood charcoal. Features 5, 7, 9 and 13 at site 41LT56 combined yielded a total of 46 fragments of burned nutshell with a total mass of 0.36 g, along with 23 fragments of wood charcoal with a total mass of 0.24 g. At site 41LT387, a combined total of 0.12 g of wood charcoal and 0.04 g of carbonized nutshell was recovered from features 2, 4, and 5.

3) Do the sites reflect primarily short-term, task-specific, extractive or processing activities or do they reflect a more sedentary occupational regime?

The largest subsite areas at sites 41LT56 and 41LT387 had the highest artifact density and diversity of any prehistoric site or subsite area sampled. These sites are thought to have arisen as a result of more-frequent and more-varied activities than those that took place at other sites and subsite areas and most likely included a combination of resource procurement and processing activities as well as residential habitation. The remaining prehistoric components are thought to represent relatively short-duration occupations as temporary camps or resource extraction locales.

4) Is there any evidence of extraregional trade or communication?

Ceramics recovered from sites 41LT56, 41LT310, and 41LT387 exhibit characteristics similar to Bear Creek Plain types found in deep east Texas and/or the Goose Creek Plain types found in Mossy Grove Gulf Coastal Plain sites and may represent affiliation or communication with those groups. However, this inference remains tentative due the small sample size of potentially extraregional
PREHISTORIC SITES: RESULTS SUMMARY RECOMMENDATIONS

Site 41LT56 is thought to have resulted from multiple occupations throughout the Archaic and Late Prehistoric periods, represented by Gary, Palmillas, and Yarbrough dart points, a Scallorn arrow point, and two ceramic sherds. The chipped and ground stone tools on-site are suggestive of a variety of activities, ranging from tool use and production to subsistence processing, to hide working. The presence of fire-cracked rocks in two of the three subsite areas, along with 17 burned rock features in one subsite area, also indicates that subsistence resources were processed on-site. Charred plant remains recovered from features 5, 7, 9, and 13 indicate they resulted in part from processing hickory nuts. Due to the general paucity of preserved subsistence and spent fuel remains recovered from the features sampled on-site, along with the fact that these remains were limited to oak and hickory, it is unlikely that additional research would yield significant data relevant to understanding the Archaic to Late Prehistoric occupation of the region. For these reasons, site 41LT56 does not appear to warrant NRHP inclusion, and no additional research is recommended.

The low density and diversity of cultural materials present at 41LT310 suggests it resulted from at least one short-duration occupation sometime during the Late Prehistoric period. The only diagnostic artifact recovered was a Late Prehistoric ceramic sherd. The presence of chipped lithic tools, ground stone tools, and fire-cracked rocks suggests that subsistence resources were processed during the prehistoric occupation. However, the absence of any preserved subsistence remains or intact cultural features prevents confirmation of this conclusion. These findings indicate that significant data resources that meet the criteria warranting NRHP inclusion are not present. Therefore, no further work is recommended at site 41LT310.

Site 41LT387 is thought to have resulted from multiple occupations during the Middle to Late Archaic and Late Prehistoric periods. Diagnostic artifacts include Neches River and Trinity dart points, a Perdiz arrow point, and two ceramic sherds. Analysis of the chipped and ground stone tools shows a variety of subsistence processing, hide processing, and tool manufacture or maintenance took place on-site.

The presence of fire-cracked rocks within the three subsite areas at 41LT387 also indicates subsistence resources were processed on-site. Charred plant remains recovered from features 2, 4, and 5 indicate they resulted in part from processing hickory nuts. Due to the general paucity of preserved subsistence and spent fuel remains recovered from features sampled on-site, along with the fact that these remains were limited to oak and hickory, it is unlikely that additional research would yield significant data relevant to understanding the Archaic to Late Prehistoric occupation of
14. Research Questions, Results Summary, and Recommendations

the region. For these reasons, site 41LT387 does not appear to warrant NRHP inclusion, and no additional research is recommended.

Site 41LT397 resulted from at least one short-duration occupation sometime during the Prehistoric period. The presence of lithic debitage suggests lithic tools were used, produced, or maintained on-site. The presence of fire-cracked rocks and ground stones suggests also that subsistence resources were processed on-site. However, due to the absence of preserved cultural features, this conclusion remains unconfirmed. The absence of intact cultural features as well as preserved subsistence and/or spent fuel remains on-site indicates it lacks significant data resources that would warrant NRHP inclusion. For these reasons, no further work is recommended at site 41LT397.

The small size and the ephemeral nature of 41LT415 suggest it resulted from a short-duration occupation. The presence of the Yarbrough dart point indicates at least one occupation during the Archaic period. The absence of cultural features and subsistence remains as well as the low density of cultural materials on-site indicates that significant data resources that warrant NRHP inclusion are not present. For this reason, no further work is recommended at site 41LT415.

The low density of cultural materials on-site 41LT422 indicates it resulted from a short-duration occupation sometime during the prehistoric period. The presence of lithic debitage and tools suggests that the tools themselves were either produced, utilized, or retouched on-site. The presence of both ground stones and fire-cracked rocks suggests further that subsistence processing occurred on-site. The absence of spent fuel remains or charred subsistence remains in the shovel testing assemblage, however, suggests interpretable intact cultural features have not been preserved on-site. These finding suggest further that site 41LT422 does not harbor significant data that meets the criteria warranting NRHP inclusion. No further investigation is recommended.

The sampled portion of the prehistoric component at site 41LT425 is ephemeral and appears to have resulted from a short-duration, possibly single-event, occupation sometime during the prehistoric period. The ephemeral nature of the cultural materials present, including a complete absence of preserved subsistence and spent fuel remains or fire-cracked rocks, strongly suggests that significant data resources are not present within the sampled portion of the prehistoric component at site 41LT425. For this reason, the sampled portion of 41LT425 does not appear to contribute to the site's overall NRHP eligibility status, and no additional work is recommended. A small portion of the prehistoric component, which is within 100 ft of two probable historic burials, was not shovel tested. Presently, it remains unknown if this remaining portion of the prehistoric component contributes to the site's overall NRHP eligibility. At this time, Luminant intends to avoid mine-related impact to this portion of the site. It is therefore recommended that mine-related impact to this portion of the site be avoided. If this is not possible, it is recommended that this portion of the site be subjected to NRHP eligibility testing.
HISTORIC SITES: RESEARCH QUESTIONS

Research on historic sites 41LT424 and 41RT413 and the historic component of 41LT425 sought to address the below research questions.

1) Is behaviorally interpretable patterning present on-site?

The depositional integrity of site 41LT424 has been compromised and behaviorally interpretable patterning is barely present. The cultural features identified on-site have been thoroughly altered via postabandonment processes that apparently included earth movement by heavy machinery.

Behaviorally interpretable cultural patterning was, however, present on-site 41RT413 where spatially isolable components were identified based on the distribution of interpretable cultural features and cultural materials across the site.

Behaviorally interpretable cultural patterning was found to be present at 41LT425. The historic component at 41LT425 is represented by two glass shards and two probable grave markers. The glass shards were identified more than 30 m away from the markers and are thought to represent an unrelated historic occupation presumably associated with nearby historic site 41LT424. Together, the grave markers likely represent a small family cemetery.

2) Have the sites maintained depositional integrity? Are intact or interpretable cultural features present?

For reasons referenced in 1) above, depositional integrity has not been maintained at site 41LT424.

The glass shards recovered from 41LT425 are thought to represent displaced materials from nearby site 41LT424 and do not indicate the presence of intact cultural deposits. The probable grave markers suggest the presence of a small cemetery. However, the depositional integrity of the presumed cemetery has not been assessed.

In contrast, relatively intact and interpretable cultural features were identified at site 41LT413, including the remains of a sawmill/cotton gin and a cattle dipping vat.

3) Do the sites represent industrial occupations, residential occupations, or both?

The cultural materials recovered from and observed at site 41LT424, along with archival research, indicate both industrial and residential activities were conducted on-site during the later nineteenth to early twentieth century.

The origins of the glass at site 41LT425 remain ambiguous and conceivably could represent an industrial or residential occupation. The probable grave markers likely represent a small family cemetery.
14. Research Questions, Results Summary, and Recommendations

Based on the excavation and archival investigation results, site 41RT413 resulted from a combination of industrial, agricultural, commercial, and domestic occupation during the later nineteenth century to early twentieth century.

4) What role in the community did the industries represented by the historic sites play?

The industries represented at both sites figured prominently in the local community during the late nineteenth century to early twentieth century.

HISTORIC SITES: RESULTS SUMMARY AND RECOMMENDATIONS

The artifact assemblage at 41LT424 reflects activities consistent with occupation of a late-nineteenth-century to early-twentieth-century working farmstead with a domestic component. No intact structural remains or remains of a ceramic kiln were located at 41LT424. Instead discrete trash pit and push pile features were found, as well as a possible lime-production site. The presence of bricks, window glass, and metal roofing indicates the possible presence of a structure at the site. The high quantity of artifacts within the Kitchen Group suggests that if a structure was present, it was likely a domicile.

The site is located adjacent to a large outcrop of kaolinite that may have been a raw material source area for a local nineteenth-century ceramic industry. NRHP testing did not provide any conclusive evidence of the mining of kaolinite at 41LT424; however, the site's proximity to three known ceramic manufacturing sites (41LT11, 41LT198, and 41LT441), a ceramic artifact assemblage containing a high concentration of ware types produced locally, and a large outcrop of kaolinite all point to a connection to a local ceramic industry.

Archival evidence indicates that site 41LT424 could have been associated with a domestic occupation beginning in the mid-nineteenth century by owner-occupants Benjamin Lewis (ca. 1862–1870) and Randolph Bural (1874–1878) and extending into the twentieth century with tenant occupations during the property's association with the Allman family (1881–1911) and the Alston family (1914–1916). The Lummus family may have lived on the property as tenants of both the Allman and Alston families and as owners during their brief ownership of the property between 1911 and 1914. Finally, the Barnetts owned the property from 1916 through the mid-twentieth century. As they had a known residence in the community of Oletha, any occupants during this period would have been tenants. Though some of the historic owners of the property may have been significant at a local level, site 41LT424 is not representative of that significance nor does it include deposits that can be associated with any one individual or family. Additionally, in the case of the Barnett family, it is one of several sites associated with their history and does not represent the most significant property associated with the family. As a result the site does not appear to qualify for NRHP inclusion under Criterion B.
The archival research also indicates the property containing site 41LT424 maintained industrial associations, at least in part as a kaolin clay-quarrying site throughout much of its history. A small lime "heap" kiln also may have been on-site. The property may have served as a clay source for local pottery manufacturers beginning in the 1860s and extending through that industry's decline in the 1920s and 1930s. Though archival research into the site's history provided additional information about the pottery-manufacturing industry and the industry's role in local economic development, the site itself does not possess the potential to provide more information about quarrying methods or those involved in the activity. Additionally, it is unlikely that additional information about the facility could be gathered from supplemental archival research as the archival research conducted during the testing phase was thorough enough to be considered mitigation level and indicated there would be little information left to learn from archival records for this site. As a result, the site does not appear to warrant NRHP inclusion under Criterion A. No further work is recommended at site 41LT424.

The overall NRHP eligibility status of the historic component at site 41LT425 remains unknown. Once the two grave markers present on-site were recorded, no additional investigation was conducted within 100 ft of the markers. The portion of the historic component greater than 100 ft distant from the probable grave markers, however, appears to lack depositional integrity and does not contribute to the component's overall NRHP eligibility status. Additionally, any work within 75 ft of the grave markers would require additional coordination with the THC and possible archeological investigation in compliance with the Texas Health and Safety Code. Consequently, it is recommended that no further investigation be conducted of this portion of the historic component. The NRHP eligibility status of the portion of the historic component within 100 ft of the probable burial markers remains unknown. It is therefore recommended that mine-related impact to this portion of the site be avoided. If this is not feasible, it is recommended that NRHP eligibility testing be completed.

Site 41RT413 resulted from both industrial and residential/commercial occupations. Two industrial components were identified in the western half of the site, represented first by the remains of a livestock dipping vat and second by a handmade brick and mortar sawmill/gin foundation that appears to be largely intact. The residential/commercial occupation is in the eastern half of the site and consists of a disarticulated brick feature, a brick and glass scatter, and a push pile with bricks.

Archival research has confirmed the presence of a sawmill and/or gin on-site as well as a commercial/residential component. The commercial/residential component appears to have been heavily disturbed and is completely lacking in depositional integrity. This component does not harbor significant data and does not contribute to the site's overall NRHP eligibility status. No further investigation of this component is warranted or recommended. Although the NRHP eligibility status of the cattle dipping vat remains unknown, due to its presumed contamination, no further investigation of it is recommended. The remains of the sawmill/gin do appear to meet the
14. Research Questions, Results Summary, and Recommendations

criteria warranting NRHP inclusion. The results of testing at site 41RT413 were reported in an interim report (Sherman et al. 2011) and the THC has concurred with these recommendations.
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Appendix A

41LT56 Trench Profiles
10YR 4/4 dark yellowish brown fine sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, friable, many fine roots

10YR 4/6 dark yellowish brown fine sandy loam, thickly bedded, diffuse boundary, no mottles, single grain, friable, few fine roots

10YR 5/6 yellowish brown mottled with 10YR 4/6 dark yellowish brown fine sandy loam, thickly bedded, diffuse boundary, many coarse faint mottles, single grain, friable, few fine roots

10YR 6/4 light yellowish brown fine sandy loam mottled with 5YR 5/8 yellowish red clay and 10YR 5/6 yellowish brown sandy loam, unknown boundary, many distinct coarse mottles, no roots
10YR 3/6 dark yellowish brown fine sandy loam, medium bedded, clear boundary, no mottles, single grain, friable, many fine roots

10YR 4/6 dark yellowish brown fine sandy loam, thickly bedded, diffuse boundary, no mottles, single grain, friable, some fine roots

10YR 5/6 yellowish brown mottled with 10YR 6/6 brownish yellow fine sandy loam, thickly bedded, diffuse boundary, many coarse faint mottles, single grain, friable, few roots

10YR 6/4 light yellowish brown mottled with 10YR 5/6 yellowish brown fine sandy loam, unknown boundary, many coarse faint mottles, no roots
10YR 4/4 dark yellowish brown fine sandy loam, medium bedded, clear boundary, no mottles, single grain, very friable, many fine roots

10YR 4/4 dark yellowish brown fine sandy loam, thickly bedded, diffuse boundary, no mottles, single grain, very friable, some fine roots

10YR 4/6 yellowish brown fine sandy loam, thickly bedded, diffuse boundary, few mottles, single grain, very friable, few fine roots

10YR 5/8 yellowish brown mottled with 7.5YR 5/8 strong brown fine sandy loam, unknown boundary, many mottles, very friable, no roots

Figure A-3
SITE 41LT56
TRENCH 3
NORTH WALL PROFILE

Drawn by S. Laurence
10YR 3/4 dark yellowish brown fine sandy loam, medium bedded, diffuse boundary, no mottles, single grain, friable, many fine roots

10YR 4/6 dark yellowish brown fine sandy loam, thickly bedded, diffuse boundary, no mottles, single grain, friable, some fine roots

10YR 5/6 yellowish brown fine sandy loam, unknown boundary, no mottles, single grain, friable, no roots
10YR 3/4 dark yellowish brown fine sandy loam, thickly bedded, clear irregular boundary, no mottles, single grain, friable, many fine roots

10YR 5/6 yellowish brown fine sandy loam, thickly bedded, clear irregular boundary, no mottles, single grain, friable, few fine roots

10YR 5/6 yellowish brown mottled with 7.5YR 5/6 strong brown fine sandy loam, unknown boundary, many coarse distinct mottles, single grain, friable
10YR 3/4 dark yellowish brown fine sandy loam, medium bedded, diffuse boundary, no mottles, single grain, friable, many fine roots

10YR 5/6 yellowish brown mottled with 7.5YR 5/6 strong brown fine sandy loam, thickly bedded, diffuse boundary, many coarse faint mottles, single grain, friable

10YR 5/6 yellowish brown mottled with 7.5YR 5/6 strong brown fine sandy loam, unknown boundary, common coarse faint mottles, single grain, friable

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**ATKINS**

**Figure A-6**

**SITE 41LT56**

**TRENCH 6**

**NORTH WALL PROFILE**
Figure A-7

SITE 41LT56
TRENCH 7 - 8
NORTH WALL PROFILE

10YR 4/4 dark yellowish brown fine sandy loam, medium bedded, diffuse boundary, no mottles, single grain, friable, many fine roots

10YR 6/4 light yellowish brown mottled with 10YR 5/6 yellowish brown fine sandy loam, thickly bedded, diffuse boundary, many coarse faint mottles, single grain, friable

10YR 6/4 light yellowish brown mottled with 10YR 5/6 yellowish brown fine sandy loam, medium bedded, unknown boundary, many coarse faint mottles, single grain, friable
10YR 4/4 dark yellowish brown fine sandy loam, thickly bedded, clear irregular boundary, no mottles, single grain, friable, many carbon chunks and fine roots

10YR 6/4 light yellowish brown mottled with 7.5YR 5/8 strong brown fine sandy loam, thickly bedded, diffuse boundary, many coarse faint mottles increasing with depth, few fine roots

7.5YR 5/8 strong brown sandy clay, unknown boundary
I. 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear irregular boundary, no mottles, single grain, friable

II. 10YR 5/6 yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

III. 7.5YR 5/8 strong brown, clay mottled with 2.5YR 4/8 red clay and 10YR 6/2 light brownish gray sandy clay, unknown boundary, many medium and distinct mottles

Figure A-9

SITE 41LT56
TRENCH 11
NORTH WALL PROFILE

Drawn by: S. Laurence
I 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

II 10YR 5/6 yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

III 10YR 5/6 yellowish brown mottled with 7.5YR 5/8 strong brown sandy loam, thickly bedded, clear and wavy boundary, many fine faint mottles, single grain, friable

IV 10YR 6/6 brownish yellow mottled with 7.5YR 5/8 strong brown sandy loam, unknown boundary, many fine faint mottles, single grain friable

Figure A-10

SITE 41LT56
TRENCH 12
NORTH WALL PROFILE

Drawn by: S. Laurence
10YR 5/6 yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 6/6 brownish yellow sandy loam mottled with 7.5YR 5/6 strong brown sandy clay, few distinct medium mottles
10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 5/6 yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 5/6 yellowish brown sandy loam mottled with 7.5YR 5/8 strong brown clayey sand, thickly bedded, clear and wavy boundary, many fine faint mottles, single grain, friable

10YR 5/8 yellowish brown sandy loam mottled with 2.5YR 4/6 red and 5YR 5/8 yellowish red sandy clay, unknown boundary, common medium distinct mottles
IOYR 3/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

IOYR 4/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

IOYR 4/6 dark yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, thinly bedded, many coarse mottles

10YR 6/6 brownish yellow sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, many coarse mottles

**Figure A-13**

SITE 41LT56
TRENCH 17
NORTH WALL PROFILE

Drawn by: S. Laurence
I 10YR 3/4 dark yellowish brown sandy loam, medium bedded, diffuse boundary, granular, no mottles, single grain, friable, many fine roots
II 10YR 4/6 dark yellowish brown sandy loam, thickly bedded, diffuse boundary, granular, no mottles, single grain, friable, many fine roots
III 10YR 4/6 dark yellowish brown mottled with 10YR 3/4 dark yellowish brown sandy loam, thickly bedded, diffuse boundary, granular, common fine distinct mottles, single grain, friable, many fine roots
IV 10YR 5/6 yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, granular, few distinct mottles, single grain, friable
II
10YR 3/4 dark yellowish brown sandy loam, medium bedded, diffuse boundary, medium granular, no mottles, single grain, friable, many fine roots

III
10YR 4/6 dark yellowish brown mottled with 10YR 3/4 dark yellowish brown sandy loam, thickly bedded, diffuse boundary, few distinct mottles, single grain, friable

IV
10YR 5/6 yellowish brown mottled with 10YR 3/4 dark yellowish brown sandy loam, unknown boundary, few fine distinct mottles, single grain, friable
I. **IOYR 3/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable**

II. **IOYR 4/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable**

III. **IOYR 4/6 dark yellowish brown mottled with IOYR 5/4 yellowish brown sandy loam, thickly bedded, clear and wavy boundary, few medium faint mottles, single grain, friable**

IV. **IOYR 6/4 light yellowish brown mottled with 7.5YR 5/8 strong brown sandy loam, unknown boundary, few fine faint mottles, single grain, coarse**

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**Figure A-16**

**SITE 41LT56**

**TRENCH 23**

**NORTH WALL PROFILE**

Drawn by S. Laurence
So-a', I
IOYR 3/4 dark yellowish brown sandy loam, medium bedded, diffuse boundary, no mottles, single grain, friable, some fine roots

II
IOYR 4/4 dark yellowish brown sandy loam, unknown boundary, no mottles, single grain, friable, few fine roots

Burned Rock

ATKINS

Figure A-17
SITE 41LT56
TRENCH 24
NORTH WALL PROFILE

Drawn by S. Laurence
IOYR 4/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

II 10YR 5/4 yellowish brown sandy loam, thinly bedded, clear and irregular boundary, no mottles, single grain, friable

III 10YR 5/6 yellowish brown sandy loam, unknown boundary, single grain, friable

Hematite

Figure A-18
SITE 41LT56
TRENCH 27
NORTH WALL PROFILE

Drawn by S. Laurence
10YR 3/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 4/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 4/4 dark yellowish brown sandy loam mottled with 7.5YR 4/4 brown sandy clay, thickly bedded, clear and wavy boundary, many fine distinct mottles

10YR 5/6 yellowish brown sandy loam mottled with 7.5YR 4/4 brown sandy clay, unknown boundary, granular, many fine distinct mottles

Figure A-19
SITE 41LT56
TRENCH 29
NORTH WALL PROFILE

Drawn by: S. Laurence
I 10YR 3/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

II 10YR 4/4 dark yellowish brown mottled with 10YR 3/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, few fine distinct mottles, single grain, friable

III 10YR 5/4 yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, common medium distinct mottles

Figure A-20
SITE 41LT56
TRENCH 30
NORTH WALL PROFILE

Drawn by: S. Laurence
10YR 3/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable.

10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable.

10YR 4/6 dark yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, thickly bedded, clear and wavy boundary, many coarse mottles.

10YR 6/6 brownish yellow sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, many coarse mottles.
10YR 3/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 4/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable

10YR 4/6 dark yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, medium bedded, many coarse mottles

10YR 6/6 brownish yellow sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, many coarse mottles

Figure A-22
SITE 41LT56
TRENCH 34
NORTH WALL PROFILE
I. 10YR 3/4 dark yellowish brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain, friable.

II. 10YR 4/4 dark yellowish brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, friable.

III. 10YR 4/6 dark yellowish brown sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, medium bedded, common coarse mottles.

IV. 10YR 6/6 brownish yellow sandy loam mottled with 7.5YR 4/6 strong brown sandy clay, unknown boundary, common coarse mottles.
Appendix B

41LT56, Utilized Flake and Ground Stone Attributes
Appendix B  
Table B-1. Site 41LT56, Utilized Flake Attributes

<table>
<thead>
<tr>
<th>Lot No.</th>
<th>Material</th>
<th>Utilized Edge (mm)</th>
<th>Modified Edge Shape/Location</th>
<th>Utilization</th>
<th>Use material</th>
<th>Form</th>
<th>Thermal Alteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>162.1</td>
<td>Chert</td>
<td>4.25</td>
<td>Straight/lateral</td>
<td>Cutting</td>
<td>Soft</td>
<td>Flake Fragment</td>
<td>None</td>
</tr>
<tr>
<td>196</td>
<td>Chert</td>
<td>6.17</td>
<td>Slightly convex/distal</td>
<td>Cutting</td>
<td>Medium soft</td>
<td>Complete</td>
<td>None</td>
</tr>
<tr>
<td>211.1</td>
<td>Chert</td>
<td>7.99</td>
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<td>Cutting</td>
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Appendix C

41LT387 Trench Profiles
10YR 6/3 pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, fine roots

10YR 7/3 very pale brown sandy loam with few, fine, distinct mottles of 10YR 8/1 white sandy loam, single grain

---

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Figure C-1

SITE 41LT387
TRENCH 1
SOUTH WALL PROFILE

Drawn by S. Laurence
10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain

10YR 8/2 very pale brown sandy loam, some hematitic inclusions, no mottles, single grain

ATKINS

Figure C-2

SITE 41LT387
TRENCH 2
SOUTH WALL PROFILE
10YR 6/3 pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain

10YR 7/3 very pale brown sandy loam, medium bedded, clear and wavy boundary, no mottles, single grain

10YR 8/2 very pale brown sandy loam, no mottles, single grain
10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, many fine roots

10YR 8/1 white sandy loam, no mottles, small hematite inclusions, single grain
10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, many fine roots

10YR 8/1 white sandy loam, no mottles, small hematite inclusions, single grain

Figure C-5
SITE 41LT387
TRENCH 8
SOUTH WALL PROFILE
10YR 6/3 pale brown sandy loam, many fine roots

10YR 7/4 very pale brown sandy loam, few fine roots

10YR 7/3 very pale brown compact sandy loam, few hematite and rock inclusions, few roots
10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, hair to large roots

10YR 8/1 white sandy loam, no mottles, small hematite inclusions, single grain

Figure C-7
SITE 41LT387
TRENCH 10
SOUTH WALL PROFILE

Drawn by S. Laurence
Figure C-8
SITE 41LT387
TRENCH 11
SOUTH WALL PROFILE

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10YR 7/3 very pale brown sandy loam, thickly bedded, clear and wavy boundary, no mottles, single grain, many fine to small roots

10YR 8/1 white sandy loam, small hematite inclusions, single grain

Root

0 40 centimeters
Figure C-9

SITE 41LT387
TRENCH 12
NORTH WALL PROFILE

10YR 5/3 brown fine sand, many large roots, very noncompact

10YR 5/2 brown fine sandy loam, many fine roots, very compact
10YR 4/4 dark yellow brown fine sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, many fine roots

10YR 6/4 light yellow brown fine sandy loam, medium bedded, clear smooth boundary, no mottles, single grain

10YR 6/6 brownish yellow sandy clay, unknown boundary, no mottles, blocky subangular, weak, friable

Figure D-1
SITE 41LT424
TRENCH 3
EAST WALL PROFILE

Drawn by: S. Laurence
I 10YR 5/4 yellowish brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, many fine roots

II 10YR 7/4 very pale brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, few roots

III 7.5YR 5/8 brownish yellow sandy clay mottled with 10YR 6/6 brownish yellow clay, unknown boundary, many fine faint mottles, medium blocky subangular, weak, firm
I  10YR 6/2 light brownish gray sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, fine roots

II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, few fine roots

III 10YR 6/6 brownish yellow clay mottled with 10YR 8/1 white clay, unknown boundary, many fine faint mottles, medium blocky subangular, weak, firm

Figure D-3
SITE 41LT424
TRENCH 5
EAST WALL PROFILE
I 10YR 4/3 brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many fine to small roots

II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, few small roots, root/rodent disturbance

III 10YR 5/6 yellowish brown clayey sand, unknown boundary, no mottles, single grain

Root/Rodent Disturbance

Figure D-4
SITE 41LT424
TRENCH 6
SOUTH WALL PROFILE

Drawn by: S. Laurence
I 10YR 4/4 dark yellow brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, fine roots

II 10YR 5/6 yellowish brown sandy loam, medium bedded, clear smooth boundary, large mottle like zone IV, single grain, few roots, charcoal chunks

III 10YR 5/3 brown sandy loam, thinly bedded, no roots, clear smooth boundary, few coarse mottles, single grain, no visible roots, charcoal flecks

IV 10YR 6/8 brownish yellow clayey sand mottled with 10YR 7/3 very pale brown sandy loam, 10YR 8/1 white clay, and 7.5YR 5/8 strong brown clay, unknown boundary, many coarse distinct mottles, blocky subangular, weak, friable

---

**Figure D-5**

SITE 41LT424
TRENCH 7
EAST WALL PROFILE
I 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear irregular boundary, no mottles, single grain, fine roots, few hematitic gravels

II 10YR 5/4 yellowish brown sandy loam, thinly bedded, clear broken boundary, no mottles, single grain, fine roots

III 10YR 7/4 very pale brown sandy loam, medium bedded, clear broken boundary, no mottles, single grain, fine roots

IV 10YR 6/8 brown yellow clayey sand mottled with 7.5YR 6/8 reddish yellow clay, unknown boundary, common medium distinct mottles, blocky subangular, moderate, firm, small roots
I 10YR 3/2 very dark grayish brown sandy loam, medium bedded, diffuse wavy boundary, no mottles, single grain, many medium roots

II 10YR 5/4 yellowish brown sandy loam, thinly bedded, diffuse irregular boundary, no mottles, single grain

III 10YR 5/8 yellowish brown mottled with 5YR 5/8 yellowish red clay, medium bedded, unknown boundary, many coarse prominent mottles, blocky subangular, medium, strong
I 10YR 4/3 brown sandy loam, medium bedded, smooth clear boundary, no mottles, single grain, many small and medium roots

II 10YR 5/4 yellowish brown sandy loam, medium bedded, wavy clear boundary, no mottles, single grain, many small and medium roots

III 10YR 6/4 light yellowish brown sandy loam, thinly bedded, smooth clear boundary, no mottles, single grain, some roots

IV 10YR 6/8 brownish yellow mottled with 10YR 5/8 yellowish red clay, unknown boundary, many coarse distinct mottles, blocky angular, moderate, firm, few small roots
10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many small roots

10YR 6/6 brownish yellow mottled with 5YR 5/6 yellowish red clayey sand, unknown boundary, few fine distinct mottles, blocky subangular, weak, friable, few roots
I 10YR 4/3 brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many small roots, 1 iron strap

II 10YR 5/8 yellowish brown mottled with 5YR 5/8 yellowish red and 10YR 8/2 very pale brown clay, unknown boundary, few medium distinct mottles, blocky subangular, weak, friable, some small roots
I 10YR 3/2 very dark grayish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many medium roots

II 7.5YR 5/8 strong brown sandy clay, unknown boundary, no mottles
I 10YR 4/3 brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many fine roots

II 10YR 5/8 yellowish brown mottled with 7.5YR 5/8 strong brown clay, unknown boundary, common medium distinct mottles, blocky subangular, medium, moderate, firm, no roots
10YR 4/1 brown sandy loam, medium bedded, smooth clear boundary, no mottles, single grain, some fine roots

10YR 5/4 yellowish brown sandy loam, thickly bedded, smooth clear boundary, no mottles, single grain, some small roots, charcoal flecks, some hematite gravels

10YR 6/6 brownish yellow mottled with 5YR 5/8 yellowish red clay, unknown boundary, common fine distinct mottles, blocky subangular, weak, friable

Brick Fragment

Figure D-13
SITE 41LT424
TRENCH 15
WEST WALL PROFILE

ATKINS

Drawn by S. Laurence
I 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain, many fine roots

II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain

III 10YR 6/8 yellowish brown mottled with 5YR 5/8 yellowish red sandy clay, unknown boundary, many medium mottles, blocky subangular, moderate, friable
10YR 6/3 pale brown sandy loam, medium bedded, clear smooth boundary, no mottles, single grain

10YR 5/6 yellowish red mottled with 10YR 5/8 yellowish brown sandy clay, unknown boundary, blocky subangular, moderate, firm
10YR 6/3 pale brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain

10YR 6/4 light yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain

10YR 7/3 very pale brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain

10YR 6/8 yellowish brown mottled with 7.5YR 5/6 strong brown clay, unknown boundary, few fine faint mottles, blocky subangular, very fine, friable
I  10YR 5/3 brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain
II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain
III 10YR 6/8 brownish yellow sandy clay, unknown boundary, few fine faint mottles, granular, fine, friable

Figure D-17
SITE 41LT424
TRENCH 19
EAST WALL PROFILE

ATKINS

Drawn by S. Laurence
I

10YR 5/4 yellowish brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain, small roots

II

10YR 6/4 light yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, small roots

III

10YR 5/6 yellowish brown sandy clay, unknown boundary, few fine faint mottles, granular, fine, friable
10YR 5/3 brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many roots

10YR 5/4 yellowish brown sandy loam, thickly bedded, clear irregular boundary, no mottles, single grain, small roots, very small hematite, charcoal flecks

10YR 6/3 pale brown sandy loam, thinly bedded, clear broken boundary, no mottles, single grain, small roots

10YR 6/2 light brownish gray sandy loam, thinly bedded, no mottles, single grain, small roots

10YR 5/2 grayish brown sandy loam, thinly bedded, no mottles, single grain, small roots

10YR 5/8 yellowish brown sandy clay, unknown boundary, no mottles, granular, fine, friable

Hematite
Limestone
5YR 5/8
Yellowish Red Clay

Figure D-19
SITE 41LT424
TRENCH 21
EAST WALL PROFILE

Drawn by S. Laurence
Trench 23

Iron “Frame” 20 cmbs

Anomaly 15

1. 10YR 4/2 dark grayish brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain
2. 10YR 5/6 yellowish brown sandy loam, thickly bedded, clear irregular boundary, no mottles, single grain, some hematite, metal
3. 10YR 6/4 light yellowish brown sandy loam, thinly bedded, clear broken boundary, no mottles, single grain
4. 10YR 6/8 brownish yellow mottled with 10YR 8/1 white clay, unknown boundary, few fine distinct mottles, granular, fine, friable

Figure D-20
SITE 41LT424
TRENCH 23
EAST WALL PROFILE

Metal

0 20 centimeters
I 10YR 5/4 yellowish brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain
II 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain
III 10YR 7/3 very pale brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain
IV 10YR 7/4 very pale brown clay mottled with 10YR 8/1 white clay and 10YR 6/8 brownish yellow clay, unknown boundary, few fine faint mottles, granular, fine, friable
Iron Rod and Barbed Wire 10 cmbs

Anomaly 25

Trench 25 meters

III

10YR 5/4 yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, small roots

II

10YR 6/4 light yellowish brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain

III

10YR 5/8 yellowish brown mottled with 10YR 7/4 very pale brown clayey sand, unknown boundary, few fine faint mottles, granular, fine, very small percentage of decayed hematite

ATKINS

Figure D-22

SITE 41LT424
TRENCH 25
EAST WALL PROFILE
10YR 5/3 brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain, many roots

10YR 6/3 pale brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain

10YR 7/4 very pale brown sandy loam, thinly bedded, clear wavy boundary, no mottles, single grain

10YR 5/8 yellowish brown clay mottled with 7.5YR 5/8 strong brown clay, unknown boundary, many fine faint mottles, granular, fine, friable

Figure D-23
SITE 41LT424
TRENCH 26
WEST WALL PROFILE
I 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many fine roots, hematite and limestone

II 10YR 6/6 brownish yellow clayey sand, unknown boundary, few fine faint mottles, blocky subangular, weak, friable
I 10YR 4/4 dark yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, many fine roots, 1 whiteware

II 10YR 7/4 very pale brown sandy loam, thinly bedded, broken boundary, no mottles, single grain, fine roots

II 10YR 6/8 brownish yellow clay mottled with 10YR 5/8 strong brown clay, unknown boundary, blocky subangular, coarse, firm, small hematite gravels
1. 10YR 6/6 brownish yellow silty clay, thickly laminated, clear wavy boundary, no mottles, single grain, blocky angular, medium strong firm

2. 10YR 5/8 yellowish brown clay mottled with 5YR 5/8 yellowish red clay, many medium prominent mottles, blocky angular, coarse, many small roots

Figure D-26
SITE 41LT424
TRENCH 30
SOUTH WALL PROFILE

Drawn by S. Laurence
I 10YR 6/4 light yellowish brown sandy loam, medium bedded, clear wavy boundary, no mottles, single grain, fine roots

II 10YR 5/6 yellowish brown clay mottled with 10YR 8/1 white clay, many medium faint mottles, granular, fine friable
Appendix E

Specimen Inventories
(on CD only)
Appendix F

Plant Remains from Sites 41LT56 and 41LT387
PLANT REMAINS FROM
SITES 41LT56 AND 41LT387
LIMESTONE COUNTY, TEXAS

Prepared for:

Linda Ellis, M.A., R.P.A.
Archaeology Laboratory Director
Atkins (formerly PBS&J)
6504 Bridge Point Parkway, Suite 200
Austin, Texas 78730-5091

Prepared by:

Leslie L. Bush, Ph.D., R.P.A.
Macrobotanical Analysis
12308 Twin Creeks Rd., B-106
Manchaca, TX 78652

June 24, 2011
Six flotation samples (47 liters) from site 41LT56 and nine flotation samples (71 liters) from site 41LT387 were submitted for identification and analysis. Both sites are located in southeastern Limestone County, Texas. Site 41LT56 lies on a knoll overlooking the Steele Creek floodplain. Soils are loamy fine sands, and the site is currently in pasture (Texas Historical Commission site file, June 27, 2006). Test excavations in 2006 produced only one diagnostic artifact, a Scallorn point, which is usually associated with Austin Phase Late Prehistoric occupations (Turner and Hester 1999). Site 41LT387 lies about three kilometers north northeast of 41LT56, on fine sandy loam soils above Cox Creek. This site is also in pasture. Test excavations in 2006 produced a Gary point, indicating occupation in the Late to Transitional Archaic (Texas Historical Commission site file, July 17, 2006).

ECOLOGICAL SETTING

Southeastern Limestone County lies in the Post Oak Savannah ecological region (Gould 1962). Upland vegetation on the Post Oak Savannah is characterized by a mixture of trees and grasslands. Oaks and hickories are the common trees, especially post oak (Quercus stellata), blackjack oak (Q. marilandica), and Texas hickory (Carya texana) (Bezanson 2000; Diggs et al. 2006). Yaupon (Ilex vomitoria), catbriar (Smilax bona-nox), American beautyberry (Callicarpa americana), and farkelberry (Vaccinium arboenum) are typical understory plants (Bezanson 2000). In the past, areas of tall grasses interspersed among the woodlands would have included native grasses such as Indiangrass (Sorghastrum nutans), little bluestem (Schizachyrium scoparium), and switchgrass (Panicum virgatum) (Diggs et al. 2006). On sandier sites, sandjack oak (Quercus incana; also called bluejack oak) and sand post oak (Q. margaretta; also called runner oak) would be the more common oak trees, with yucca (Yucca louisianensis) and prickly pear (Opuntia humifusa) present in the understory (Diggs et al. 2006). Wetter areas along Steele and Cox Creeks may have been able to support sugarberry-elm communities where sugarberry (Celtis laevigata; also called hackberry), cedar elm (Ulmus crassifolia), and green ash (Fraxinus pennsylvanica) dominate the canopy. Grape vines (Vitis spp.), poison ivy (Toxicodendron radicans), sedges (Cyperaceae), and wet land grasses such as wildrye (Elymus spp.) and wood oats (Chasmanthium spp.) would also have been common (Bezanson 2000:51; Diggs et al. 2006:122–3).

Modern equivalents exist for most prehistoric plant communities in Texas despite changes in the abundance and structure of the communities (Diggs et al. 2006:87). The most notable changes on the Post Oak Savannah since presettlement times include an increase in woody vegetation and the loss of "bottom prairie" communities along major rivers such as the Brazos and Trinity (Diggs et al. 2006:115–116). Pollen studies indicate that use of the modern vegetation zones described above is appropriate for understanding the plants and attendant animal resources available to people during the first and second millennia. Weakly Bog, situated in the Post Oak Savannah vegetation region in Leon County, provides some of the best data for vegetation reconstruction in the eastern half of Texas during the last 3,000 years (Bousman 1998). Pollen profiles from this bog indicate oak and later oak/hickory woodlands, suggesting that modern plant communities generally provide
good analogs for historical Texas plant communities during the last 3,000 years. A recent study by Bruce Albert in southwest Upshur County provides supporting data for the period of occupation at the Limestone County sites (Albert 2007). Some fluctuations in rainfall and temperature have taken place (Bousman 1998:204), but even decades-long fluctuations in rainfall patterns seem to be part of the natural background of Late Holocene climate patterns (Stahle and Cleaveland 1992). In addition, more frequent fires in would have made the woody vegetation less prominent than during the last century or so (Diggs et al. 2006; MacRoberts et al. 2002).

METHODS

Flotation samples from sites 41LT56 and 41LT387 were processed at Atkins North America, Inc. (Atkins), formerly PBS&J, Austin offices in a Flot-Tech closed flotation system. Light fractions were caught in a 0.212 millimeter (mm) mesh, and heavy fractions were caught in 1.0 mm bottom mesh before being sorted through a stack of geologic mesh with square openings of 19 mm, 9.5 mm, and 4.75 mm to remove larger rocks. Material smaller than 4.75 mm was sent to Macrobotanical Analysis along with the light fractions. Heavy fractions were scanned under the microscope, and all carbonized botanical material was removed and added to the light fractions prior to sorting. Only light fractions (including the botanical material retrieved from heavy fractions) are reported here.

Flotation samples were sorted according to standard procedures at the Macrobotanical Analysis laboratory in Manchaca, Texas (Pearsall 2000). Each sample was weighed on an Ohaus Scout II 200 x 0.01 g electronic balance before being size-sorted through a stack of graduated geologic mesh. Material that did not pass through the No. 10 mesh (2-mm square openings) was completely sorted, and all carbonized botanical remains were counted, weighed, recorded, and labeled. Uncarbonized botanical material larger than 2 mm (roots and rootlets) was weighed, recorded, and labeled as “contamination.” Material that fell through the 2-mm mesh (“residue”) was examined under a stereoscopic microscope at 7-45 X magnification for carbonized botanical remains. Any identifiable plant material that had not been previously identified in the material larger than 2 mm was removed from residue, counted, weighed, recorded, and labeled. Uncarbonized macrobotanical remains other than rootlets were recorded on a presence/absence basis on laboratory forms.

Identification was attempted for all wood charcoal fragments sufficiently large to be identified as wood charcoal. Wood charcoal fragments were typically snapped to reveal a clean transverse section and examined under a stereoscopic microscope at 28-180 X magnification. When necessary, tangential or radial sections were examined for ray seriation, presence of spiral thickenings, types, and sizes of intervessel pitting, and other minute characteristics that can only be seen at the higher magnifications of this range. Some material from site 41LT387 Lot 360 was not large enough to break for a clean tangential section. It is identified as hardwood based on the vessels visible in tangential section.
Appendix F (Cont’d)

Botanical materials were identified to the lowest possible taxonomic level by comparison to materials in the Macrobotanical Analysis comparative collection and through the use of standard reference works (Core et al. 1979; Davis 1993; Hoadley 1990; Martin and Barkley 2000; Musil 1963; Panshin and de Zeeuw 1980). Botanical nomenclature follows that of the Plants Database (United States Department of Agriculture, Natural Resources Conservation Service [USDA, NRCS] 2011).

RESULTS

Table F.1 shows carbonized (ancient) plant remains from site 41LT56, and Table F.2 shows uncarbonized (modern) plants from that site. Tables F.3 and F.4 show the same information for site 41LT387. Archeological plant remains were sparse at both sites, although slightly more abundant at site 41LT56. Wood charcoal, nutshell, a grass stem, and indeterminable botanical material were the only plant parts recovered in carbonized form. Uncarbonized plants consisted of roots, rootlets, leaf fragments, grass stems, buds, and seeds. Uncarbonized plants are interpreted as parts of modern plants currently or very recently growing on the site. The discussion below concerns carbonized remains only.

Table F.1: Carbonized Plants from Flotation
Site 41LT56
Count (weight in grams)

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<th>Lot #</th>
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<td>10</td>
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<tr>
<td>Wood charcoal</td>
<td>Quercus subg. Quercus</td>
<td>White group oak</td>
<td>2 (0.01)</td>
<td>3 (0.03)</td>
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<tr>
<td></td>
<td>Quercus sp.</td>
<td>Oak</td>
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<td>1 (0.01)</td>
<td>1 (0.01)</td>
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<td></td>
<td>Carya sp.</td>
<td>Hickory, pecan-type</td>
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<td>Hardwood</td>
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<td>3 (0.01)</td>
<td>1 (0.01)</td>
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<td>Nutshell</td>
<td>Carya sp.</td>
<td>Hickory, thick-shelled</td>
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<td>6 (0.04)</td>
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<td></td>
<td>Juglandaceae</td>
<td>Hickory/walnut family</td>
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<td>Carbonized stem</td>
<td>Poaceae</td>
<td>Grass family</td>
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Appendix F (Cont’d)

Table F.2: Uncarbonized Seeds (and Leaves) from Flotation
Site 41LT56
Presence/Absence

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<table>
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<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th># of occurrences</th>
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<tr>
<td>Croton sp.</td>
<td>Croton</td>
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<td>Lamiaceae</td>
<td>Mint family</td>
<td>X X X</td>
</tr>
<tr>
<td>Juniperus sp.</td>
<td>Juniper (needles)</td>
<td>X X X</td>
</tr>
<tr>
<td>Cyperus sp.</td>
<td>Flatsedge</td>
<td>X X</td>
</tr>
<tr>
<td>Panicodae</td>
<td>Panicoid grass</td>
<td>X X</td>
</tr>
<tr>
<td>Rudbeckia/Echinacea sp.</td>
<td>Coneflower</td>
<td>X X</td>
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<td>Silene sp.</td>
<td>Catchfly</td>
<td>X X</td>
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<tr>
<td>Ulmus crassifolia</td>
<td>Cedar elm (leaf)</td>
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<td>Chenopodium sp.</td>
<td>Goosefoot</td>
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<td>Phytolacca americana</td>
<td>Pokeweed</td>
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<tr>
<td>Poaceae</td>
<td>Grass family</td>
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<tr>
<td>Quercus fusiformis</td>
<td>Live oak (leaf)</td>
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Table F.3: Carbonized Plants from Flotation
Site 41LT387
Count (weight in grams)

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<th>Wood charcoal</th>
<th>Quercus sp.</th>
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<th>3 (0.02)</th>
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<td>Carya sp.</td>
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<td>Hardwood</td>
<td>Hardwood</td>
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<td>Nutshell</td>
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</tr>
<tr>
<td>Juglandaceae</td>
<td>Hickory/walnut family</td>
<td>1 (0.01)</td>
<td>1 (0.01)</td>
<td>13 (0.02)</td>
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Appendix F (Cont'd)

Table F.4: Uncarbonized Seeds (and Leaves) from Flotation
Site 41LT387
Presence/Absence

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<td>8</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Liters processed</td>
<td>1.5</td>
<td>6.5</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Botanical Name</td>
<td>Common Name</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mollugo verticillata</td>
<td>Carpetweed</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Juniperus sp.</td>
<td>Juniper (needles)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Panicodae</td>
<td>Panicoid grass</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cyperus sp.</td>
<td>Flatsedge</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Daisy family</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Croton sp.</td>
<td>Croton</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Poaceae</td>
<td>Grass family</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Lamiaceae</td>
<td>Mint family</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rudbeckia/Echinacea sp.</td>
<td>Coneflower</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Oxalis sp.</td>
<td>Wood sorrel</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Oenothera/Calyophus sp.</td>
<td>Evening primrose</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Polygonaceae</td>
<td>Buck wheat family</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Ulmus crassifolia</td>
<td>Cedar elm (leaf)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Quercus fusiformis</td>
<td>Live oak (leaf)</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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</table>

DISCUSSION

Site 41LT56. Nutshell was the most common plant remain recovered, with 46 specimens weighing 0.36 g found. Approximately half could be identified as thick-shelled hickory, while the remainder could be identified only to the family Juglandaceae, which includes walnut and pecan as well as hickory.

Twenty-three fragments of wood charcoal weighing 0.24 g were recovered from the site. Oak was the most common type of wood, and five fragments could be further identified to the white group within the oak genus (Quercus subg. Quercus). A single fragment of pecan-type wood of the genus Carya was present in Lot 529. The remainder of the wood was identifiable only as hardwood. Black hickory (C. texana), a common tree on the Post Oak Savannah, has pecan-type wood and thick nutshells, making it a likely identification for the Carya nutshell and wood found at site 41LT56.

In addition to nutshell and wood charcoal, a single grass stem and several fragments of indeterminable botanical material were recovered from the site. At least some of the indeterminable material is consistent with acorn nutshell but could not be conclusively identified.
Site 41LT387. The total carbonized plant weight from this site was a mere 0.16 g. Many decaying rootlets were observed in the samples, and their dark color may have given the impression of charcoal in the field. Wood charcoal and nutshell were the only archeological plants identified from site 41LT387. Wood charcoal was the more common taxon, with 40 fragments weighing 0.12 grams identified. More than half of the wood charcoal consisted of fragments smaller than 1.4 mm from lots 359 and 360. These fragments could be identified only as hardwood, as could some of the material from lots 312 and 314. A single fragment of hickory or pecan wood (*Carya* sp.) was present in Lot 360. The remaining eight specimens were identified as oak.

Fifteen Juglandaceae nutshell fragments weighing 0.04 g were recovered from three lots (315, 359, and 360). Nut-bearing members of the Juglandaceae in eastern and central Texas are hickory, walnut, and pecan (Correll and Johnston 1970).

**General comments.** The sparse macrobotanical remains at sites 41LT56 and 41LT387 consist primarily of the most common and durable remains found on archeological sites in the region: wood charcoal and Juglandaceae nutshell. They almost certainly do not represent the full range of plants utilized at the sites. The findings are particularly frustrating in light of a heavily worn metate and abundant burned rock that suggest an emphasis on plant processing activities at site 41LT387. Nonetheless, the plants indicate at a minimum the use of wood for fuel and exploitation of nut mast for food.

The wood charcoal assemblage at both sites is made up of trees that would be expected in the immediate site vicinity. Both of the wood genera recovered, oak and hickory, make high quality fuel wood, burning slowly at high temperatures and with excellent coaling properties. The nutmeat exploited by inhabitants of the two sites would have provided calories, especially protein and fats that could have been critical at times of year when game was lean or not abundant. If nuts were processed by the traditional “hickory soup” method (Fritz et al. 2001; Moerman 1998), they could account for the burned rocks and metate at site 41LT387, but so could other plant processing activities such as earth oven cooking of geophytes.

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Moerman, Daniel E.

Musil, Albina F.

Panshin, A.J., and Carol de Zeeuw
Appendix F (Cont’d)

Pearsall, Deborah M.


Stahle, David W., and Malcolm K. Cleaveland


Turner, Ellen Sue, and Thomas R. Hester


United States Department of Agriculture, Natural Resources Conservation Service (USDA, NRCS)
