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MOORE ARCHEOLOGICAL CONSULTING, INC.

Moore Archeological Consulting, Inc.
Report of Investigations Number 613

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Prepared for
Harris County Improvement District No. 4,
DBA Energy Corridor Management District
Houston, Texas

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ABSTRACT

This report documents the National Register significance testing and data recovery investigations conducted from February 27-March 15, 2012 (testing), and June 11-25, 2012 (data recovery), at the site of 41HR1114 by Moore Archeological Consulting, Inc. The site is located just west of Lower Mayde Creek, in west Harris County, Texas. The site had been first located during a February, 2012 survey conducted by Moore Archeological Consulting, Inc. in preparation for a proposed extension of the Park Row Boulevard Right-of-Way (Moore and Driver 2012). The survey alignment was privately owned at the time of the survey, and therefore, neither the Antiquities Code of Texas nor Section 106 of the National Historic Preservation Act of 1966 mandated the survey. However, the survey was carried out as proactive due diligence as a key element of the future regulatory requirements for a private development project on an ambitious development schedule. The survey identified three sites, 41HR1114, 41HR1115, and 41HR1116.

Significance testing excavations at 41HR1114 were conducted in February and March, 2012, and were also carried out as proactive due diligence. The test excavations consisted of hand excavation and backhoe trenching with a focus on geomorphological assessment of the site, including the depositional reconstruction and identification of the degree of intactness of the deposits. These investigations determined that the site possessed the potential for future research, and should be considered eligible for listing on the National Register of Historic Places (NRHP). At that point, the development project was subsumed within the Harris County Improvement District No. 4, DBA Energy Corridor Management District, and further investigations fell under the jurisdiction of the Texas Historic Commission (THC) permitting process. To facilitate planned development schedules, the proposed Park Row Boulevard Right-of-Way alignment was divided into smaller segments, with 41HR1114 located in the Phase 1 segment. This portion of the alignment measures approximately 850 m (2800 ft) in length, and the area of potential effect (APE) in the area of 41HR1114 is limited to a 36.5 m (120 ft) wide ROW (Figure 1). The data recovery investigations at 41HR1114 were conducted under Texas Antiquities Permit Number 6274.

During the significance testing and data recovery field investigations at 41HR1114, a total of sixteen 1 x 1 m hand units (XU 1-16) were excavated. XUs 1-4 were conducted as distinct 1 x 1 m units (XUs 1, 2, and 4 were placed adjacent to backhoe trenches) during the testing phase, while the remainder of the hand excavations were conducted as two 2 x 3 m block excavations (subdivided into XUs 5-10 and 11-16) as part of the data recovery phase. Three backhoe trenches (BHTs 1-3) totaling 45 m in length were excavated, two during the testing phase and one during the data recovery operations. The excavations produced a total of 4431 artifacts. These materials were recovered from Levels 1-14 (0-150 cmbs), but with the highest concentrations of artifacts encountered in Levels 3-7. The chronologically diagnostic dart point types, in conjunction with the presence of ceramics and the lack of arrow points, indicate occupations at the site spanning the Middle Archaic to Early Ceramic periods.

However, the vertical distribution of diagnostic artifacts and the geoarchaeological assessment of the site deposits indicate the presence of significant bioturbation-related disturbance of cultural materials located throughout the site. Consequently, the real, and quite significant contribution of this project is instead, the intensive geoarcheological analysis of the Late Pleistocene and Early Holocene alluvium and of the nature and appearance of soil formation within such deposits at the site, and by extension for the Houston area. The current investigation has considerably diminished the paucity of information on the deposits lain down by small streams in the region, as well as provided insight into the pedogenic processes associated with argillic horizons in the late Pleistocene and Holocene soils of Southeast Texas.

We may conclude by reiterating that the Data Recovery excavations at 41HR1114 were successful in providing new information on the prehistory of the site and the broader Houston region. The contribution from the strictly archeological analysis of the cultural materials and contexts yielded by the site are modest. In contrast, the results of the intensive geoarcheological analysis of the site are quite novel and important, and have considerable broader application in the future analysis and evaluation of prehistoric sites within the Houston region. No further archeological work is recommended for 41HR1114. Once the current report is finalized, the artifacts recovered from 41HR1114 will be curated at TARL.

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CHAPTER 1
INTRODUCTION

This report documents the National Register significance testing and data recovery investigations conducted from February 27-March 15, 2012 (testing), and June 11-25, 2012 (data recovery), at the site of 41HR1114 by Moore Archeological Consulting, Inc. The site is located just west of Lower Mayde Creek, in west Harris County, Texas. The site had been first located during a February, 2012 survey conducted by Moore Archeological Consulting, Inc. in preparation for a proposed extension of the Park Row Boulevard Right-of-Way (Moore and Driver 2012). The survey alignment was privately owned at the time of the survey, and therefore, neither the Antiquities Code of Texas nor Section 106 of the National Historic Preservation Act of 1966 mandated the survey. However, the survey was carried out as proactive due diligence as a key element of the future regulatory requirements for a private development project on an ambitious development schedule. The survey identified three sites: 41HR1114, 41HR1115, and 41HR1116.

Significance testing excavations at 41HR1114 were conducted in February and March, 2012, and were also carried out as proactive due diligence. The test excavations consisted of hand excavation and backhoe trenching with a focus on geomorphological assessment of the site, including the depositional reconstruction and identification of the degree of intactness of the deposits. These investigations determined that the site possessed the potential for future research, and should be considered eligible for listing on the National Register of Historic Places (NRHP). At that point, the development project was subsumed within the Harris County Improvement District No. 4, DBA Energy Corridor Management District, and further investigations fell under the jurisdiction of the Texas Historic Commission (THC) permitting process. To facilitate planned development schedules, the proposed Park Row Boulevard Right-of-Way alignment was divided into smaller segments, with 41HR1114 located in the Phase 1 segment. This portion of the alignment measures approximately 850 m (2800 ft.) in length, and the area of potential effect (APE) in the area of 41HR1114 is limited to a 36.5 m (120 ft.) wide ROW (Figure 1). The data recovery investigations at 41HR1114 were conducted under Texas Antiquities Permit Number 6274.

The site 41HR1114 area is depicted on the Addicks, Texas 7.5' USGS topographic quadrangle map (Figure 2, THC copy only). The site represents a prehistoric occupation located in the alluvial drape of the Holocene meander belt of South Mayde Creek, and is approximately 125 m west of the stream’s current channel. Initially the site was only delineated within the proposed roadway alignment ROW, and its north-south dimensions had yet to be defined outside of the ROW at the time of testing and data recovery (Figure 3). However, during the current report preparation, a privately owned 9-acre tract immediately north of the site was surveyed, and the additional portion of the site delineated (Driver and Moore 2013). Based on the delineation data from the two surveys (Figure 4), the site measures 60 m east-west by at least 70 m north-south, and covers approximately 0.5 acres (ca. 0.2 ha). While the dimensions of the southern portion of the site remain unknown, the documented site boundaries suggest it extends to the south beyond the ROW alignment for a relatively short distance.

The current investigations included the hand excavation of a total of 16 square meters, and the mechanical excavation of three trenches totaling 45 m in length (Figure 3). The hand excavations consisted of four 1 x 1 m units (XUs 1-4) conducted during the testing phase, and two large, 2 x 3 m block excavations (XUs 5-10, and 11-16) conducted during the data recovery phase. The three backhoe trenches (BHTs 1-3) were excavated as part of the geoarchaeological investigations. BHT 1 was located in the eastern half of the site, while BHTs 2 and 3 were placed in the western end of the site.

The hand excavations were conducted by project archeologist Randy Ferguson, and field technicians Tunde Babalola, Charlie Burton, Rachel Goings, Adam Moody, and Jake Muonio. The geoarchaeological excavations were conducted by Charles Frederick, Ph.D., and Brittney Gregory, while the lithic artifact analysis was conducted by Blaine Ensor. David Driver, Ph.D., served as the original principal investigator. Eleanor Stoddart assumed the PI role for later stages of the project.

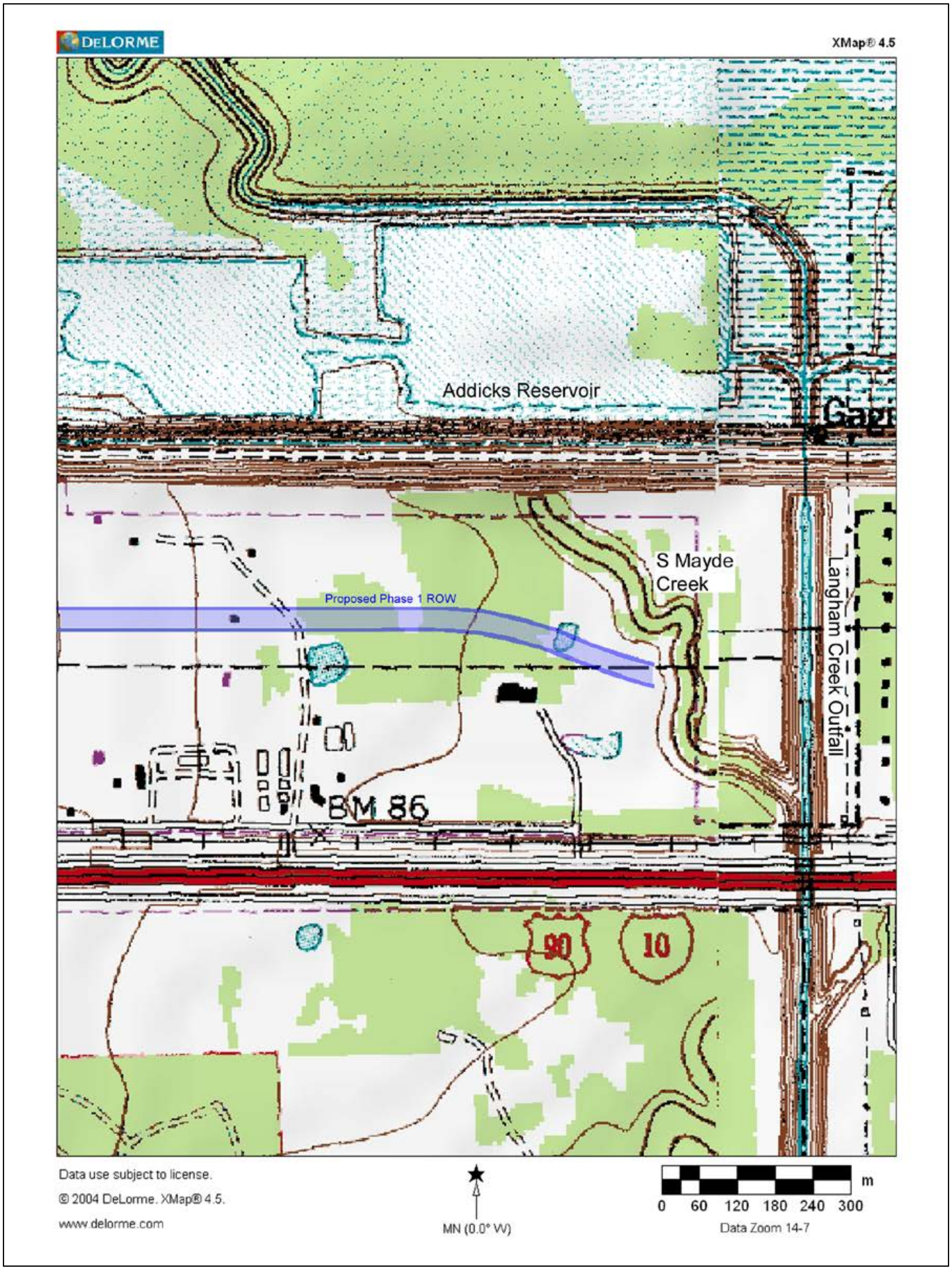

Figure 1. Map showing the location of the proposed Park Row Phase 1 alignment and the site 41HR1114 project area, Harris County, Texas (Addicks Quad, USGS).

Figure 2. Map showing the location of the proposed Park Row Phase 1 alignment and site 41HR1114, Harris County, Texas (Addicks Quad, USGS). THC copy only.

Figure 3. Site map of 41HR1114 showing results of Park Row Boulevard survey, testing, and data recovery investigations within the proposed alignment ROW. Compare with Figure 4 map of 41HR1114 showing northern extension of site into later 9-acre tract survey area. REDACTED FOR THC

Figure 4. Site map of 41HR1114 showing combined results of road alignment survey (gray area) and 9-acre tract survey (northern area). Compare with Figure 2.
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CHAPTER 2
ENVIRONMENTAL BACKGROUND

Soils and Geology

Harris County is located within the West Gulf Coastal Plain physiographic province (Hunt 1974). In the Texas region, the surface topography of the plain is characterized by relatively flat topography that dips slightly towards the Gulf of Mexico. Geologically, the project area lies atop the Lissie Formation, a surface outcrop that extends from just east of the Mississippi River in Louisiana, to Kingsville, Texas (Bureau of Economic Geology 1982). The formation was deposited during a series of glacial and interglacial events during the Middle to Late Pleistocene. Extensive riverine downcutting and erosion of the formation occurred during the periods of lower sea levels associated with the Wisconsin glaciation.

The project area is depicted on sheet 89 of the *Soil Survey of Harris County* (Wheeler et al. 1976). The single soil type present at the site is Midland silty clay loam (Md). Midland soils are described as nearly level prairie soils that are poorly drained, with very slow runoff. The soils are described by Abbott (2001) as upland loamy ancient (pre-Holocene) alluvium with low potential for containing deeply buried prehistoric sites.

Climate

The modern climate of the Harris County study area is moderated by winds from the Gulf of Mexico, resulting in mild winters and relatively cool summer nights (Wheeler 1976:2, 66). Summer temperatures average 92°F (33°C), while winter temperatures average 64°F (18°C). Annual precipitation averages 46 inches (117 cm).

Hydrology

The project area is located approximately 120 m west of the natural channel of South Mayde Creek. This section of the stream was cut off by the construction of the Addicks Reservoir dam embankment in the 1940s, and the water diverted to an artificial Langham Creek spillway channel located 200 m further to the east. Though cut off from its main sources, a small amount of runoff water continues to flow through the abandoned natural channel of South Mayde Creek. The geoarcheological study determined that the site is located on a Late Pleistocene terrace between two Holocene-age meander belts of the stream (see Chapter 3).

Flora and Fauna

Harris County lies within the Austroriparian biotic province (Blair 1950:98-101). Not determined by a marked physiographic break, the western boundary of this province is loosely identified by the distribution of pine and hardwood forests on the eastern Gulf coastal plain. The county is situated within the pine-oak subdivision of the Austroriparian province (Tharp 1939). Blair (1950) lists the dominant floral species of the pine-oak forest subdivision as loblolly pine (*Pinus taeda*), yellow pine (*Pinus echinata*), red oak (*Quercus rubra*), post oak (*Quercus stellata*), and blackjack oak (*Quercus marilandica*). Hardwood forests are found on lowlands within the Austroriparian and are characterized by such trees as sweetgum (*Liquidambar* *styraciflua*), magnolia (*Magnolia grandiflora*), tupelo (*Nyssa sylvatica*), water oak (*Quercus nigra*), and other species of oaks, elms, and ashes, as well as the highly diagnostic Spanish moss (*Tillandisia usneiodes*) and palmetto (*Sabal glabra*).

Blair (1950) and Gadus and Howard (1990) identify the following mammals as common within the Austroriparian province: white-tailed deer (*Odocoileus virginianus*), muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), coyote (*Canis latrans*), opossum (*Didelphis virginiana*), eastern mole (*Scalopus aquaticus)*, eastern pipistrelle bat (*Pipistrellus subflavus*), eastern red bat (*Lasiurus borealis*), fox squirrel (*Sciurus niger*), eastern gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), pocket gopher (*Geomys breviceps*), slender harvest mouse (*Reithrodonomys fulvescens*), white-footed mouse (*Peromyscus leucopus*), marsh rice rat (*Oryzomys palustris*), cotton rat (*Sigmodon hispidus*), packrat (*Neotoma floridana*), eastern cottontail (*Sylvilagus floridanus*), and swamp rabbit (*Sylvilagus aquaticus*). Bison (*Bison bison*) may have been present on nearby grasslands at various times in the past (Gadus and Howard 1990:15). Common turtles include eastern box turtle (*Terrapene carolina*) and *Terrapene ornata*, while snapping turtle (*Chelydra serpentinia*), mud turtle (*Kinosteron* spp.), river cooter (*Chrysemys concinna*) and diamondback terrapin (*Malaclemys terrapin*) are also present. Common lizards include green anole lizard (*Anolis carolinensis*), eastern fence lizard (*Sceloporus undulates*), skink (*Leiolopisma laterale*), broad-headed skink (*Eumeces laticeps*), six-lined racerunner (*Cnemidophorus sexlineatus*), and eastern glass lizard (*Ophiosaurus ventralis*). Snakes and amphibians are also present in considerable numbers and diversity.

CHAPTER 3
GEOARCHAEOLOGICAL INVESTIGATIONS AT 41HR1114

Charles D. Frederick, Ph.D., Brittney Gregory, and Mark D. Bateman

Introduction

This chapter reports the results of geoarchaeological investigations at 41HR1114 that were designed to assess the age and integrity of the site deposits. The site, 41HR1114, is situated on the Gulf Coastal Plain, near the confluence of South Mayde Creek and Bear Creek, immediately north of Interstate 10 on the west side of Houston, Texas (Figures 2, 5). The site is located about 17 miles upstream from downtown Houston.

The bedrock geology in this location is close to the contact between the Beaumont Formation and the Lissie Formation and mapping by the Bureau of Economic Geology (1982), places 41HR1114 on the Beaumont Formation, with the contact between the Beaumont and Lissie Formations lying a short distance to the west near Highway 6. The Beaumont Formation is a suite of fluvial-deltaic sediments that accumulated over multiple glacial-interglacial periods in the latter half of the Pleistocene. Unlike the next older coastal terrace deposit, the Lissie Formation, the Beaumont Formation is known for relatively well-preserved relict fluvial geomorphic features (cf. Van Siclen 1985) many of which have been mapped by the Bureau of Economic Geology in the various sheets of the Geologic Atlas of Texas (in this particular case, the Houston sheet, cf. Bureau of Economic Geology 1982).

Early descriptions of the Beaumont list the formation as interbedded sands and clays where the sands range in color from grey, red, yellow, pink, or blue depending on the source material; and the clays can be blue, yellow, pink, red, grey, and purple (Duessen 1924, Sellards et al. 1932) but today it is perhaps most widely known for the black clayey soils that dominate its surface (cf. Nordt et al., 2006; 2008). A few terrestrial vertebrate fossils are known from the Beaumont Formation but the most common are marine to brackish invertebrates (primarily clams and oysters) that have been of little assistance in dating the deposit. Indeed, the age of the Beaumont Formation has been the source of contention for some time. Although some authors place deposition of this unit around 35,000 years BP (e.g. Nordt et al 2008; 2006) numerous authors (e.g. Heinrich 2007; McFarlan 1961, Otvos 1971, Aronow 1988) have reported "dead" radiocarbon ages in excess of 40,000 years which suggest that it is not datable by this method. Prior to luminescence dating the general consensus was that the Beaumont Formation represented fluvial deltaic deposition during the last interglacial sea level high stand of oxygen isotope stage 5 (Blum and Aslan 2006:186; Winker 1982).

However, recent work on the Beaumont Formation in the lower Colorado River alluvial plain by Blum and Price (1998) and more recently Blum and Aslan (2006) have demonstrated that the Beaumont Formation can be subdivided into distinct valley fill complexes, and they named three: Lolita, El Campo and Bay City. These complexes represent deposition by the ancestral Colorado River between approximately 330,000 and

100,000 years BP. It is likely that the patchwork quilt-like nature of the Beaumont Formation is very complex. In the immediate vicinity of the site, the Beaumont Formation deposits were most likely deposited by streams ancestral to the modern San Jacinto River.

Geomorphology

The site lies in an alluvial lowland which exhibits a subtle, yet complex suite of topographic features. Hints of this are visible in aerial imagery of the area, but unfortunately, the modern United States Geological Survey topographic maps are contoured at a level that is insufficient to resolve such complex topography. However, recent mapping of the Houston area with LIDAR (LIght Detection And Ranging) techniques provide a digital elevation data set or model (DEM) that is capable of portraying the features of this subtle landscape (Figure 5, middle panel). Examination of the DEM for the landscape in the immediate vicinity of the site shows what appear to be two shallowly incised meander belts of Mayde Creek that are probably Holocene courses of the stream. The easternmost of these was active at the time Addicks Dam was constructed. The site lies on a slightly higher surface between these two meanderbelts that is a terrace of Mayde Creek. When 41HR1114 was tested, this surface was thought to be either Early Holocene or Late Pleistocene age, but it was difficult to be certain with the information that was available at that time. It is now known that this surface was formed by Mayde Creek in the Late Pleistocene.

The landscape in the immediate vicinity of the site was substantially altered by the construction of Addicks Dam and Reservoir, which was completed in 1948 in order to diminish the potential of flooding of downtown Houston by Buffalo Bayou following large floods in 1928 and 1935. In addition to the construction of the dam immediately north of the site (the dam forms the north side of the area of the LIDAR DEM on Figure 5, middle panel), this Corps of Engineers project cut off the active channel of Mayde Creek, and created a new, artificial channel that flows out from the dam that today is labeled “Langham Creek” (labeled on the geologic interpretation, bottom panel of Figure 5, and immediately east of the area of the LIDAR DEM in the middle panel of that illustration).

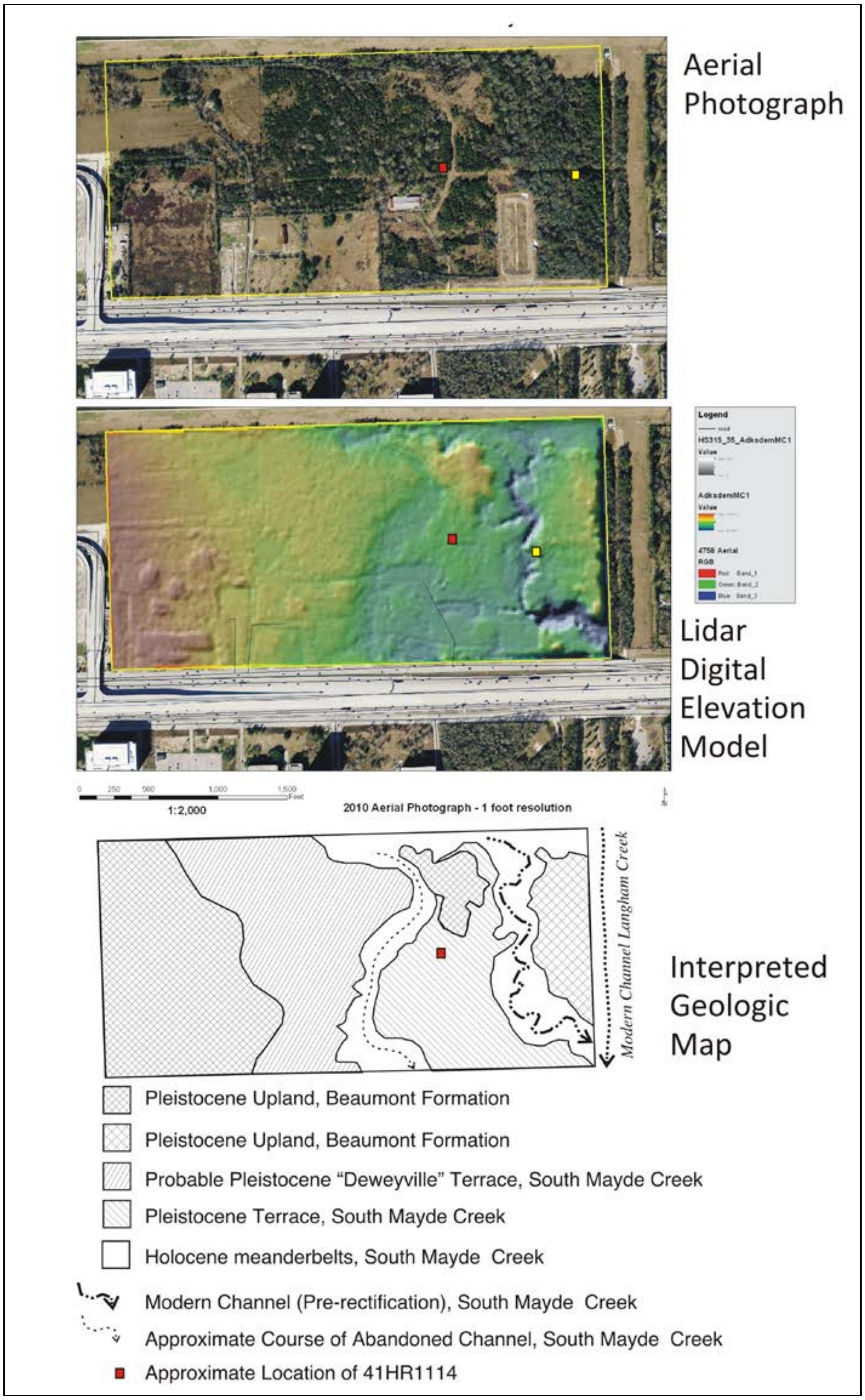

Figure 5. Views of the environment in the immediate vicinity of site 41HR1114. *Top Panel*: Aerial photograph. *Middle Panel*: Color coded LIDAR digital elevation map superimposed on the aerial image. *Bottom*: Geologic interpretation of the geomorphic features visible on the LIDAR topographic map, revised with the benefit of the work reported in this chapter.

Soils

The soils in the vicinity of the site have been mapped by Wheeler (1976) as the Midland Series, which are classified as fine, smectitic, thermic Chromic Vertic Epiaqualfs that have formed in clayey and silty sediment of Pleistocene age (see also Soil Survey Staff 2013). These soils were originally described as having an Ap-B21tg-B22tg-B23tg-B3g profile but the official series description today lists the typical pedon as having an Ap-Btg-Btkg-Btkssg1-Btkssg2 profile.

Field Observations and Sampling

Evaluation of the site during testing was limited in depth by a seasonally high water table, but at that time it appeared that there were three different age deposits present: a recent alluvium, an early Holocene alluvium, and the Pleistocene Lissie Formation. The intermediate alluvial deposit appeared to thicken to the west and thin to the east. Upon returning to the site for the data recovery excavations, the water table was lower than during testing, which permitted deeper excavations and a more complete image of the site deposits. Examination of these exposures immediately made clear that there are only two major deposits present at the site: an older alluvium at depth, and a thin veneer of younger alluvium on top of it. Furthermore, the stratigraphy across the site was fairly consistent. As a result of these observations, a set of samples were collected that would permit testing of the stratigraphic model, as well as assess the contextual integrity of the archeological assemblage (Appendix I). The samples collected were bulk sediment samples in small 2.5 cm plastic cubes for characterization of the basic physical properties of the deposits, bulk samples for microartifact analysis, oriented and undisturbed samples for soil micromorphology, and tubes of soil collected at various depths for optically stimulated luminescence (OSL) dating.

Methods

A wide range of analytical methods was employed in the analysis of the deposits exposed during the excavation of this site. The details of each method are described below.

Optically Stimulated Luminescence Dating (OSL)

The sedimentary deposits that contain the archaeological materials were dated by Optically Stimulated Luminescence Dating. Optical or OSL dating, as this method is often known, permits measurement of the amount of time that has passed since sand-sized mineral grains were last exposed to sunlight. It is useful where charcoal is not preserved and has the added benefit of providing an impression of the integrity of the deposit by providing a detailed image of the age of the matrix holding the cultural material.

The samples were dated by Dr. Mark Bateman at the Sheffield Centre for International Drylands Research, Department of Geography, The University of Sheffield, in Sheffield, England. Dr. Bateman's report (Bateman 2012) is included as Appendix II. The method of dating employed here, single grain OSL dating, determines the period of time that has passed since individual quartz sand grains were last exposed to sunlight. One "single grain" OSL date typically determines the age of a small population of sand grains, in this case between 34 and 77 grains per sample. Single grain dating, as opposed to single aliquot dating, is the OSL dating method preferred when post-depositional disturbance of the deposit is suspected because the resulting grain age population clearly show the age structure of the deposit. Alternatively, single aliquot dates, because they derive the dates from the mass properties of about 2000 sand grains, may yield erroneous results. In order to summarize complex grain age distributions, Bateman (2012) employs a finite mixture model that statistically identifies different age components with the grain age population for each sample. The basic results of the OSL dating are presented on Tables 1 and 2. The number in bold under the far right column listed as "age" is the component identified by the finite mixture model that contained the largest proportion of dated grains. Table 2 presents basic descriptive statistics (e.g. mean, median, standard deviation, maximum and minimum) for the grain ages obtained for each dated sample.

Samples for OSL dating were collected in dark gray 5 cm diameter 20 cm long PVC pipe that were hammered into the excavation walls. Six samples were collected from the site deposits, all from Depositional Unit 1. One sample was collected from Stratum 1 (sample OSL-6; Shfd-12077; 177 cm) and Stratum 2 (OSL-5; Shfd-12076; 160 cm), whereas two samples were collected from Stratum 3 (sample OSL-3; Shfd-12074; 80 cm, and sample OSL-4; Shfd-12075; 124 cm) and Stratum 4 (sample OSL-1; Shfd-12072; 42 cm; and Sample OSL-2; Shfd-12073; 60 cm). Samples 1 to 3 were collected from the north wall of XU 11, and Samples 4-6 were collected from the north wall of BHT 3.

Table 1. Results of OSL dating

Lab No.	**Field Reference**	**Dcosmic** (Gy/ka)	**Moisture** (%)	**Dose rate†** (Gy/ka)	**Depth** (cm below surface)	**FMM Component**	**Proportion of Grains**	**Age** (Years before 2012)
Shfd12072	OSL-1 XU11	0.198±0.01	7.2	0.977±0.035	42	1 2 3 4	11 49 26 11	2,000 ± 230 **3,600 ± 230** 6,100 ± 490 13,200 ± 1200
Shfd12073	OSL-2 XU11	0.193±0.01	7.9	0.958±0.034	60	1 2 3	27 49 15	5,200 ± 390 **8,400 ± 510** 16,500 ± 1,500
Shfd12074	OSL-3 XU11	0.188±0.009	13.0	1.375±0.051	80	1 2 3	34 40 22	8,400 ± 690 **13,900 ± 1,000** 27,900 ± 1,900
Shfd12075	OSL-4 BHT 3	0.177±0.009	11.4	1.172±0.042	124	1 2 3	14 31 44	4,900 ± 510 12,700 ± 1,200 **20,800 ± 1,700**
Shfd12076	OSL-5 BHT 3	0.168±0.008	10.8	0.625±0.021	160	1	100	**28,900 ± 1,100**
Shfd12077	OSL-6 BHT 3	0.164±0.008	13.4	0.843±0.029	177	1	100	**22,900 ± 1,100**

Table 2. Descriptive Statistics for OSL Grain Ages by Sample

Sample	**Field Reference**	**Mean Age**	**Median Age**	**Standard Deviation**	**Range (years)**	**Minimum Age**	**Maximum Age**	**Number of Dated Grains**
Shfd12072	OSL-1 XU11	6077	4187	5436	26076	1785	27861	54
Shfd12073	OSL-2 XU11	10604	8414	6651	29495	3282	32777	77
Shfd12074	OSL-3 XU11	15038	13578	8462	37815	3271	41085	48
Shfd12075	OSL-4 BHT 3	14933	14628	11631	46765	0	46765	34
Shfd12076	OSL-5 BHT 3	30270	29922	8917	63861	0	63861	52
Shfd12077	OSL-6 BHT 3	32374	29915	13674	77550	15740	93290	39

Particle Size Analysis

The particle size distribution (or texture) of each sample was determined on a Beckman-Coulter LS 13-320 multi-wavelength laser sizer. Samples were first subsampled, and then placed in a small beaker on a hot plate to which concentrated (30%) hydrogen peroxide was added in order to remove organic matter and a 5% solution of sodium hexametaphosphate was added to disperse the fine fraction. Samples were brought to a boil and then left on the hot plate until the reaction had ceased or the color of the sediment had changed, at which point they were removed from the hot plate, cooled and then measured on the LS-13-320. The results of these analyses are presented as percentages of sand, silt and clay, as well as in the form of descriptive statistics that are presented in phi units (a negative log base 2 conversion of millimeters). In the phi system, sands exhibit phi values between 0 and 4, silts between 4 and 9, and clay > 9 phi. Several authors have noted an apparent discrepancy between laser sizer and hydrometer/pipette measurements of the clay content and recommend using a slightly larger threshold for clay when using laser sizer data (cf. Konert and Vandenberghe 1997). To this end the clay-silt boundary was placed at 6 microns rather than 2 for the laser sizer data to be more comparable to traditional particle size methods. The USDA soil texture class for each sample was determined using the Soil Texture calculator provided by the NRCS website (NRCS 2012).

In addition to this work, texture analysis of six samples, mostly collected from argillic horizons, was performed using the hydrometer-sieve method (cf. ASTM 1985; Gee and Bauder 1986; Bouyoucos 1962) in order to serve as a check on the clay content of the presumed argillic horizons as determined by the laser sizer. Samples were first weighed moist and then gently passed through a 2 mm sieve taking care not to crush fragile fragments. Coarse material caught on the 2 mm sieve, was then sieved at a 1 phi interval and the mass on each sieve recorded. All of the coarse fragments caught on the >2 mm sieves were pedogenic iron-manganese concretions and the weight of these materials were determined in order to exclude them from the sample mass used to determine the properties of the alluvial sediments. A split of the <2mm size material (roughly between 75 and 150 grams) was then soaked in 50 ml of a 5% sodium hexametaphosphate solution overnight, and then mixed in a mechanical mixer for 5 minutes before being diluted to 1 liter with distilled water. This mixture was placed in a 1 liter settling jar, mechanically agitated for 1 minute, and then set on a table, after which point hydrometer readings were made at different time intervals (specifically 1, 3.5, 15, 45, 300, and 1440 minutes). A control hydrometer and temperature reading on an empty jar with nothing but distilled water and the sodium hexametaphosphate solution was made at intervals throughout the analysis to permit calibration of the hydrometer. A small split of the <2 mm soil was also oven dried to determine the moisture content and correct the sample mass used in the hydrometer analysis (hygroscopic moisture correction). After 24 hours, the contents of the hydrometer jar were wet sieved through a 37 micron sieve, and the sand retained on the sieve was transferred to a beaker and oven dried at 105˚C. This sand was subsequently sieved at 0.5 phi intervals once dry and the mass retained on each sieve recorded. From these data the percentage of gravel, sand, silt and clay, as well as various descriptive statistics were calculated for the grain size distribution using a spreadsheet written by Paul Lehman.

Loss-on-ignition (LOI)

The organic matter content of the samples was estimated using the weight loss-on-ignition method following Schulte and Hopkins (1996; see also Heiri et al. 2001 and Nelson and Sommers 1996). Loss-on-ignition (or LOI) provides a reasonable estimation of organic matter content in the absence of minerals with structural water (e.g. smectite clays, gypsum) and in many cases, drying samples at 150˚ can minimize organic matter overestimation where problematic minerals are present. Samples were placed into porcelain crucibles, weighed, and dried at 150˚C overnight, after which they were weighed again, and then placed in a muffle furnace at 450˚C for 4 hours. Samples were removed from the furnace and weighed while hot, and the percentage weight loss-on-ignition was calculated.

Magnetic Susceptibility

Magnetic susceptibility is a general measure of the degree to which a sample may be magnetized, and provides basic information on the magnetic mineralogy of the sample, which may vary owing to a variety of factors, such as depositional processes, soil development, and human occupation. The general application of magnetic susceptibility in archeological studies has been discussed in detail by Dalan (2008) and Dalan and Bannerjee (1998). In order to measure the magnetic susceptibility, the samples were first dried at low temperature and weighed, and then the low frequency (470 Hz) and high frequency (4700 Hz) magnetic susceptibility (kappa) was measured in SI units on the 0.1 setting on a Bartington MS2 meter and an MS2b sensor (see Dearing 1999). The values for the mass corrected magnetic susceptibility (chi, or c_{lf}) are reported in SI units ($10^{-8} m^3 kg^{-1}$).

Micromorphology

Many soil features, such as argillic horizons, are difficult to interpret definitively in the field, so it is often desirable to examine them closely in the lab. Many of the aforementioned analyses disaggregate the dirt in order to perform the analysis, but microscopic examination of undisturbed samples provides a very different perspective of the soil and its internal organization. Soil micromorphology is the preferred methods for this task.

Samples collected for micromorphological examination consisted of small oriented blocks carved from the excavation walls that were wrapped in toilet tissue and masking tape, and subsequently dried, vacuum embedded in polyester resin (a styrene-cured unsaturated polyester resin (316 NP) catalyzed with methyl ethyl ketone peroxide, obtained from Advance Coatings Company, Westminster, Massachusetts), and then slabbed on a rock saw. Features of interest were then trimmed to fit on 2” x 3” glass slides and submitted to National Petrographics (Houston, Texas), for thin section manufacture. National Petrographic glued the 2” x 3” blanks to glass slides, cut off the excess and then ground the remaining part to 0.3 mm thickness and mounted a coverslip. The thin sections were subsequently examined at a range of magnifications. Low magnification examination was performed with the aid of a flatbed scanner and the slides were scanned at 1000 dpi using transmitted light (slide mode). Full-page color laser prints of the slide scans were used to perform the first pass assessment of each slide.

Areas of interest were then identified and examined at low magnification with a Leica S8 APO binocular microscope fitted with transmitted light base and polarizing filters. Higher magnification examination employed a Leica DMEP polarizing light microscope.

Microartifacts

Samples collected for microartifact analysis were excavated in a 5 cm thick, 20 cm x 20 cm (plan) continuous column adjacent to BHT 3, XU 5, and XU 11. In the lab these samples were weighed moist, and a small sample split off for determination of the moisture content (percentage weight loss @ 105˚C overnight), which was subsequently used to correct the total moist sample mass to a dry weight. Next, each bulk sample was placed in a bucket, to which 100 ml of 5% sodium hexametaphosphate was added, and then soaked overnight. The next day, the sample was wet screened through a 2 mm sieve, and the residue then dried. For the samples from XU 11, after soaking overnight, the bulk samples were stirred, allowed to sit for 2 minutes and then the supernant liquid was passed through a 63 micron sieve in order to retrieve material that floated. This residue was subsequently dried and scanned with a low power microscope. Dry, wet screened residues were subsequently screened through a suite of two sieves (4 mm (-2 phi), and 2 mm (-1 phi)) and sorted under a low power binocular microscope (Leica S8 APO) into various categories (specifically debitage and iron-manganese concretions). These were then counted and weighed and the results are presented on Appendix III. Selected results are plotted on Figure 15.

Microfossils

Examination of microfossils was not anticipated at the time of fieldwork, but was pursued in the lab when a number of small white spherical to cylindrical microfossils were discovered when scanning the flotation residues for the XU 11 profile under a binocular microscope. After the samples were scanned, it was apparent there were principally two distinct microfossils that appeared to be the fruiting bodies (or gyrogonites) of algae belonging to the genus *Chara*, known collectively as stoneworts. Confirmation of this impression and species identification of these two taxa was confirmed by sending photographs of each to Dr. Manuel Palacios-Fest, an expert in micropaleontology, who identified them as *Chara globularis* and *Chara filiformis*. Following identification, the number of each taxa in each flotation sample were counted in the flotation samples and plotted as a function of depth (see Figure 11).

Bulk Density

In order to estimate the volumetric amount of pedogenic clay, six samples were collected for bulk density determination, for which the paraffin clod method was used. For this analysis, rectangular blocks of undisturbed soil were cut from the excavation walls, wrapped in toilet paper and tape and then allowed to air dry. In the lab the clod was unwrapped, subsampled with a saw, and a small subsample was used to determine the moisture content. Next, a large block was tied with monofilament fishing line and weighed, then coated with paraffin and weighed again. The weight of the paraffin coated clod was then determined in water, and the difference between the weight in air and weight in water was used to calculate the bulk density (see Singer and Janitzsky 1999 for more details.).

Results of Investigations:
Stratigraphy

Impressions of the site stratigraphy varied slightly in different seasons owing to the depth of excavation that was restricted by the position of the water table. Testing excavations were limited to depths of around a meter and only exposed the upper half of the site deposits described here. The data recovery excavations, on the other hand, owing to a lower water table, reached depths approaching 2 m and revealed the full suite of deposits known now.

Two major depositional units were identified at the site, these can be subdivided into 6 major strata, two of which were occasionally subdivided in the field owing to variations in appearance and composition (Figure 6). Depositional Unit 1, the oldest deposit at the site, is a late Pleistocene alluvial terrace deposit that is divided into four parts (Strata 1 through 4), the defining attributes of which are pedogenic in origin rather than depositional. Depositional Unit 2 is a recent alluvial deposit that is thought to be less than 600 years old and is divided into two strata (Strata 5 and 6), one of which is subdivided.

Analysis of the deposits present was supported by characterization of two profiles: 1) the north wall of XU 11, and the north wall of BHT 3, near XU 5. The results of this work are presented in Figures 7 and 8.

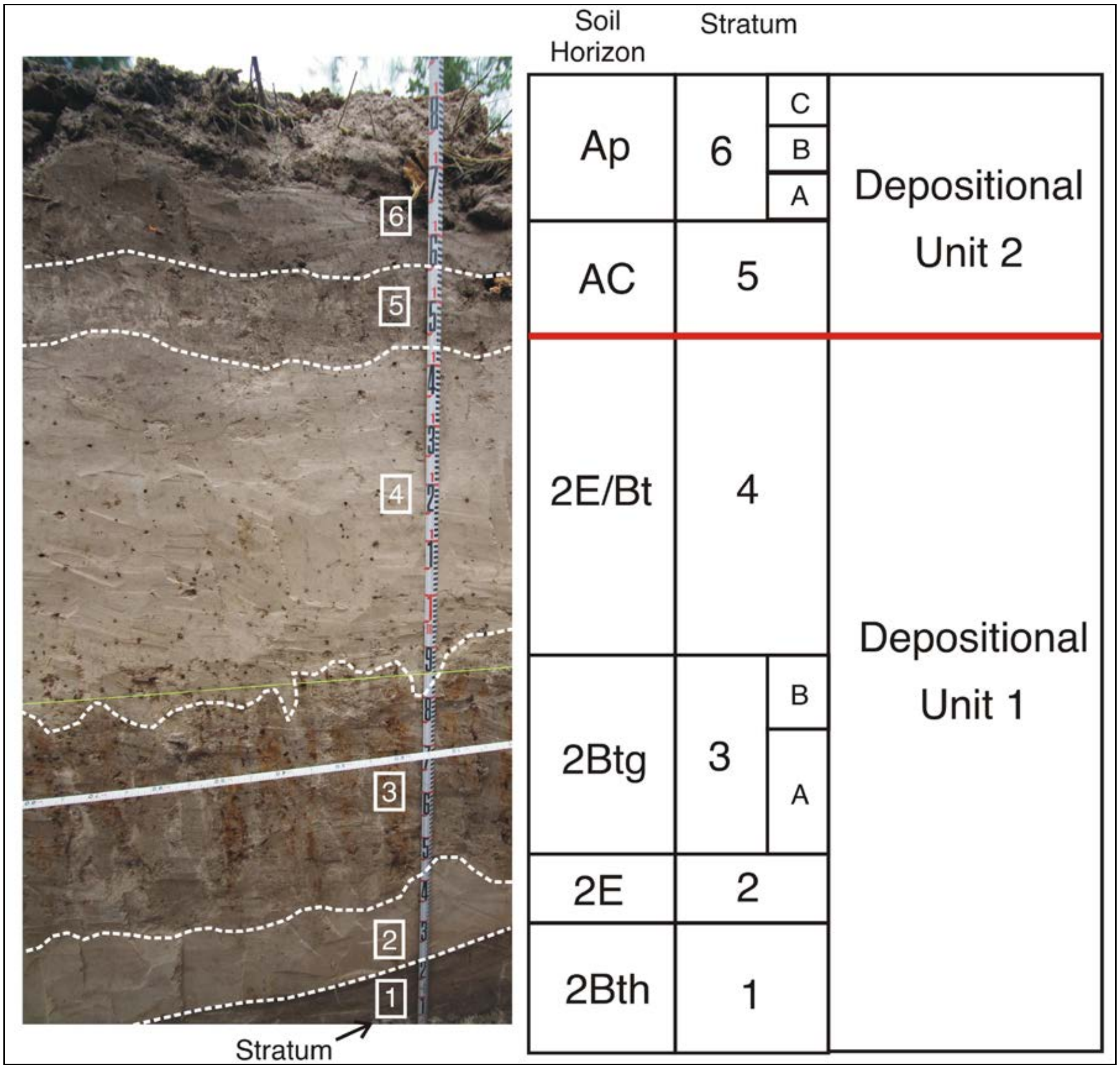

Figure 6. *Left Side*: Photograph of the north wall of Trench 3 showing the strata identified at 41HT1114. *Right side*: Simple chart linking the soil horizons with the Strata and Depositional Units observed at the site.

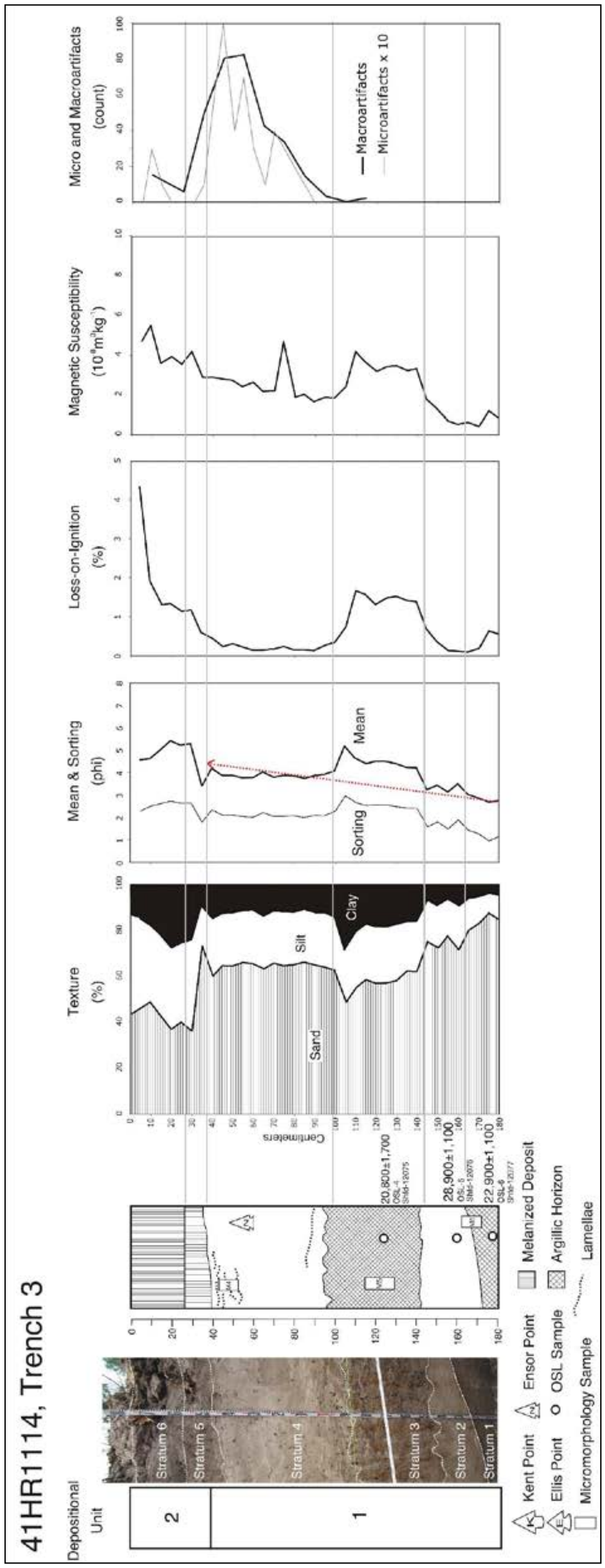

Figure 7. Plot of the deposits exposed in BHT 3 and depth variation in the basic physical properties. The red arrow on the mean particle size shows the gradual fining upward trench of Depositional Unit 1.

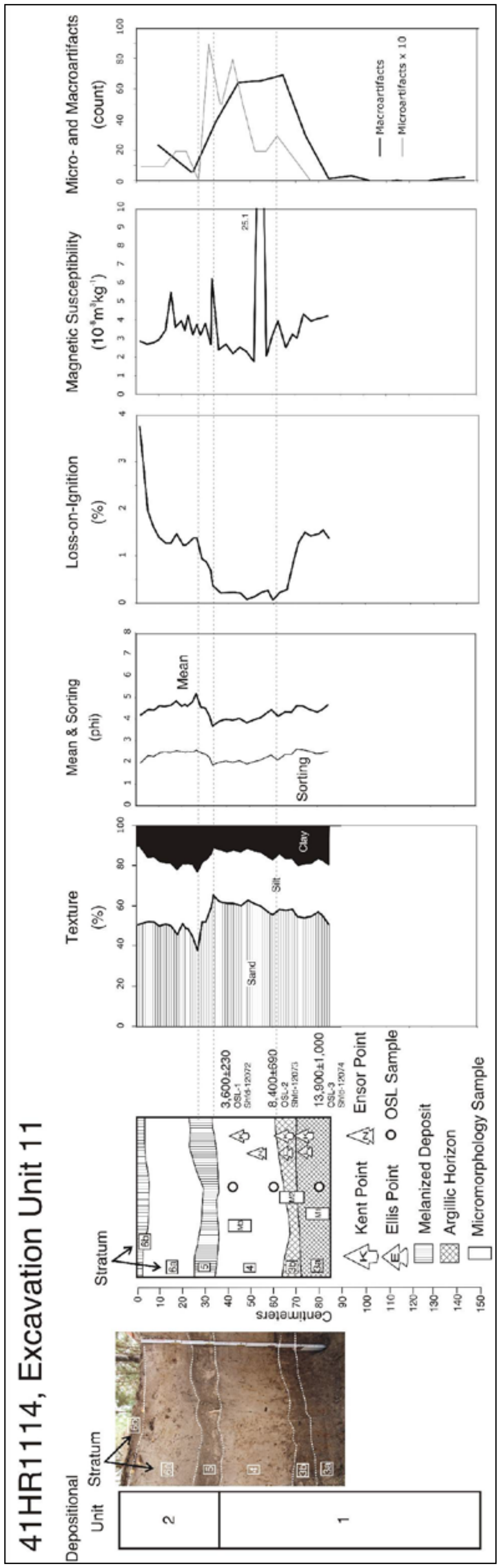

Figure 8. Plot of the deposits exposed in XU 11 showing depth variation in the basic physical properties.

Depositional Unit 1

As the oldest deposit exposed at the site Depositional Unit 1 forms the lower part of every excavation unit revealed during testing and data recovery. The base of this deposit was not observed and lies beneath the water table at a depth in excess of 1.9 meters below surface. The sedimentary deposits of Depositional Unit 1 are primarily sandy alluvium, and the unit fines gradually upward (see the mean particle size in Figure 7). Perception of this fining upward trend is inhibited by the development of a soil in these deposits, and half of the major strata identified below are pedogenic features that were not present at the time of deposition by Mayde Creek. These features, specifically argillic (or Bt) horizons (Strata 1 and 3), are the result of clay being moved downward in the soil profile and concentrated at depth and are most easily identified by means of petrographic examination of undisturbed soil thin sections. The majority of the prehistoric cultural deposits at the site were found in Depositional Unit 1, Stratum 4.

<u>Stratum 1</u>

Stratum 1 was best exposed by BHT 3, and was also revealed at the base of XU 11. This deposit, a Bth horizon, has conspicuous sharp upper boundary with Stratum 2, and consists of a very dark grayish brown (10YR 3/2, moist) to dark grayish brown (10YR 4/2, moist) moderately to poorly sorted loamy sand that was very friable and had no discernible soil structure (was massive). The top few centimeters were notably darker color than the underlying portion of the deposit and when performing the sieve-hydrometer analysis it was clear from the reaction between the deposit and a 5% solution of sodium hexametaphosphate that this deposit contains some illuvial organic matter. The deposit shows a slight increase in loss-on-ignition which could reflect organic matter or structural water loss by smectite clays. In most exposures, the top few centimeters of this deposit exhibited a pseudo-laminated appearance. Petrographic examination of this deposit indicates it is an argillic horizon (Figure 9) and sieve-hydrometer analysis of this deposit suggests that it contains about 5% more clay than the parent material (for which the overlying Stratum 2 was used to approximate; see Table 3). A very few iron-manganese concretions are present in Stratum 1.

The age of this deposit was assessed by OSL sample 6, which was collected from a depth of 177 cm in BHT 3. The 39 grains dated from this sample exhibited a single mode in the finite mixture model analysis with an age of 22,900±1,100 years BP (Shfd-12077). The youngest grain measured was 15,740 years old and the oldest grain was reset 93,290 years ago, and the simple mean grain age was 32,374 years. It is clear from the OSL data that Stratum 1 was deposited by Mayde Creek in the Pleistocene between 20,000 and 30,000 years ago.

Table 3. Results of Hydrometer Analysis of Argillic Horizons.

Stratum	Context	Field Sample	Depth	Clay	Bulk Density	Pedogenic Clay	Pedogenic Clay
			(cm)	(%)	(g/cm^3)	(%)	(g/kg)
3	Btg Horizon	BD-1	93-105	20.0	1.9	18.3	34.9
3	Btg Horizon	BD-2	110-113	20.2	1.9	18.5	35.5
3	Btg Horizon	BD-3	119-125	18.7	1.9	17.0	32.4
3	Btg Horizon	BD-4	129-136	18.0	1.9	16.3	30.3
2	Parent Material	BD-5	159-149	1.7	1.6	0.0	0.0
1	Bth Horizon	BD-6	149-152	6.6	1.7	4.9	8.5

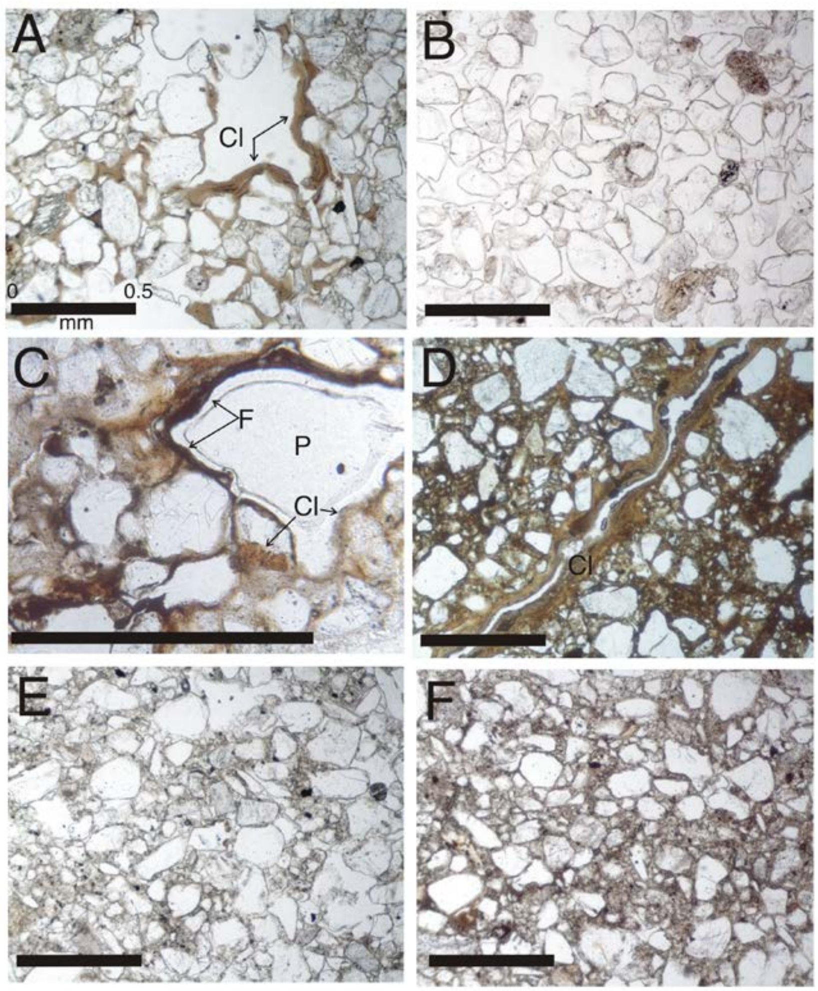

Figure 9. Photomicrographs of various pedogenic features, primarily from Strata 1, 2, 3 and 4. All scale bars are 0.5 mm long. A. View of clay lamellae at the top of Stratum 1 showing light brown illuvial (Cl) lining a pore and bridging grains. B. Clean sand of Stratum 2, directly above the interface with Stratum 1. C. Pore lining in Stratum 3 Bt horizon showing illuvial clay (light brown, Cl) followed by iron-manganese (F). D. Another photo from Stratum 3 showing a skew plane with thick illuvial clay coat. Note also the abundant silt and illuvial clay between the framework grains. E. View from Stratum 4 of the sediment immediately above a lamellae. F. View a few millimeters below E of a lamellae. Note the significant increase in silt in the interstitial space.

Stratum 2

Overlying Stratum 1 was a clean, loose to very friable, poorly sorted, massive, pale brown (10YR 6/3, moist) sandy loam to loamy sand that exhibited no evidence of bedding and only minor pedogenic alteration. This E-horizon contained a few (3%) strong brown (7.5YR 5/6) mottles and a few (generally <1%) fine (1-5 mm) iron-manganese concretions (0.3 % to 1.0% by weight), the frequency of which is greatest immediately above the interface with Stratum 1.

None of the trench or hand excavations penetrated deeper than Stratum 1, so it was not possible to obtain a sample of Unit 1 that had been unaltered by soil development (aka pedogenesis). But the sandy sediment of Unit 1, Stratum 2 appears to have been relatively unaltered and is considered a reasonable approximation of what Unit 1 sediments looked like (in terms of petrographic as well as textural attributes) before prolonged pedogenesis. Comparison of the textural attributes of Stratum 2 with the bounding argillic horizons (Strata 1 and 3; see Table 3) permits comparison of how the clay content of the argillic horizons has been altered since deposition in the late Pleistocene.

The OSL dating sample collected from Stratum 2 in BHT 3 yielded a unimodal age distribution that dated to 28,900±1,100 years BP (Shfd-12076) and this age is perhaps the best OSL age for the deposition of Unit 1. A total of 52 grains were dated from this sample and the mean age of this population was 30,270 years BP, with the oldest dated grain being 93,290 years BP and the youngest 15,740 years BP. The apparent age reversal between this sample and OSL-6 collected from Stratum 1, 17 cm beneath it, may be attributable to the pedogenic clay added to the sand of Stratum 1 during pedogenesis. If the illuvial clay has a higher dose rate, then its addition to the sand violates one of the fundamental assumptions of OSL dating, namely that the dose rate has been constant since geologic deposition (see discussion in Frederick et al. 2000). If the lower dose rate measured from OSL-5 (collected from Stratum 2) is used to calculate the age of OSL-6, then the apparent age reversal disappears and sample OSL-1 yields an age of 30,832±1,100 years BP.

Stratum 3

A pale brown (10YR 6/3, moist) to grayish brown (10YR 5/2, moist) and dark grayish brown (10YR 4/2, moist) sandy loam to sandy clay loam, Stratum 3 is an argillic (Btg) horizon that contained many 1 mm to 12 mm iron-manganese concretions that comprised between 0.5% and 4.4% of the deposit by weight. This deposit had a firm consistence, exhibited strong coarse prismatic structure, and had many fine (1 mm) distinct yellowish red (5YR 4/6) mottles lining pores and many prominent 5 to 45 mm vertically elongate yellowish red (5YR 4/6) mottles, often with dark gray (5YR 4/1) iron-manganese concretions at their center. The lower boundary of this deposit was gradual to abrupt and exhibited undulations that were deeper than wide (a gradual irregular boundary). In a few places it was possible to recognize visually distinct differences in this stratum, and where this occurred the lower was designated Stratum 3a and the upper Stratum 3b. The source of these distinctions was generally based on subtle variations in color or in some cases inclusions of sandy sediment resembling the overlying Stratum 4.

As noted previously Stratum 3 is an argillic horizon and Figure 9, C and D, provide examples of illuvial clay and iron-manganese coats lining pores and planes within this stratum. Four samples collected from this deposit were analyzed by the sieve-hydrometer method in order to determine the percentage clay (see Table 3). In order to estimate the amount of pedogenic clay in this deposit the amount of clay present in Stratum 2 was assumed to be representative of the parent material when originally deposited by Mayde Creek, and this suggests that this deposit has between 16 and 18.5% more clay than it was originally deposited with.

Two OSL samples were collected from this deposit, one in BHT 3 (OSL-4, 1.24 m; Shfd-12075) which was situated near the base of the deposit (about 17 cm above the lower boundary) and another sample (OSL-3, 80 cm) was collected from the north wall of XU 11, about 15 cm below the top of the deposit. A total of 36 grains were dated from sample OSL-4 near the base of Stratum 3. These grains returned a finite mixture model with three distinct age components, the largest of which comprised 44% of the dated grains and yielded an age of 20,800±1700 years BP. At a more general level, the dated grains exhibited a mean age of 14,933 years BP, and a minimum grain age of zero and a maximum age of 46,765 years BP. Almost 14% of the grains (n=5) were zero-dose grains, that had been reset recently, which suggests this deposit had been recently disturbed.

Sample OSL-3 (Shfd-12074), collected from near the top of Stratum 3 in XU 11, yielded a younger grain age population than sample OSL-4, and did not show any signs of the recent disturbance. Like sample 4, finite mixture model analysis of the dated grains returned three components, the largest of which comprised 40% of the dated grains and yielded an age of 13,900±1,000 years BP. The mean age of the dated grain population was 15,038 years BP and the youngest dated grain was 3271 years BP and the oldest dated grain was 41,085 years BP. At 80 cm below the modern surface, this sample was at the same general depth as two diagnostic dart points recovered from XU 11 (70-80 cm, typed as *Ellis* and *Kent*). The histogram of grain age distribution (Figure 13) shows that all of the dated grains are younger than these two diagnostic artifact types and only 13% of the grains are older than 10,000 years.

As with Stratum 1, the OSL ages from this deposit should be considered cautiously, because the clay added to this deposit during post-depositional pedogenesis (soil formation) has most likely violated the assumption of a constant dose rate. The dose rate measurements for the deposits of Stratum 3 are the largest of all the deposits measured, and if the ages of these sand grains are recalculated with the dose rate of Stratum 2, the resulting ages are considerably older than cited above.

Stratum 4

The majority of the prehistoric cultural material found at the site was recovered from Stratum 4, which is a very friable, pale brown (10YR 6/3, moist) to very pale brown (10YR 7/3, moist) very poorly sorted sandy loam. This deposit is generally massive but occasionally exhibited a weak fine subangular blocky structure, and has few to common faint medium yellowish brown (10YR 5/4) to strong brown (7.5YR 5/6) mottles and common to many dark brown (5YR 3/3) iron-manganese concretions that increased in frequency toward the base of this stratum (see Figure 15 for an illustration of the depth variation in iron-manganese concretions through this deposit). In general, near the top of Stratum 4 the iron-manganese concretions accounted for less than half a percent by weight of the deposit, whereas just above the interface with Stratum 3 they comprise almost 4% of the deposit by weight.

Most exposures of this deposit also contained numerous thin (1-2 mm) sharply defined, irregular, dark grayish brown (10YR 4/2) lamellae (Figure 10). These appeared, in some places, to be more concentrated in the top third of the deposit, but lamellae could be found throughout Stratum 4. Originally thought to be clay lamellae, micromorphologic examination of these features in petrographic thin section revealed that most were primarily composed of silt with only a small subset showing evidence of oriented clay which is typically associated with such features (see Figure 9, E and F, for photomicrographs of the matrix of Stratum 4). This is, however, a very anomalous observation when viewed in light of the soil science literature on lamellae (cf. Rawling 2001; Schaetzl and Anderson 2005:368-370; Ibrahim and Burras 2012).

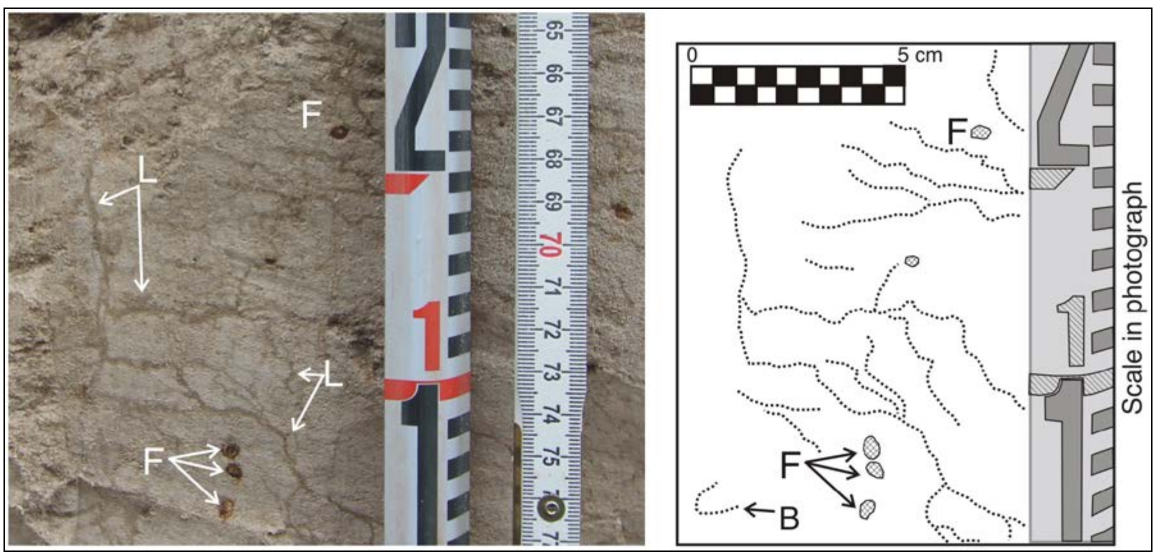

Figure 10. *Left Side*: Photograph of the lamellae (L) and iron-manganese concretions (F) in the field. *Right side*: Drawing made from the photograph highlighting the location of the lamellae in the photo (shown as dotted lines).

Temporally diagnostic artifacts discovered within Stratum 4 in XU 11, where the OSL samples were collected, included Middle Archaic *Kent* points (40-50 cm & 60-70 cm), a Late Archaic to Transitional Archaic *Ellis* point (60-70 cm) and a Transitional Archaic *Ensor* point (50-60 cm) which collectively span the period between approximately 3200 to 1600 years BP.

Two OSL samples were collected from Stratum 4: OSL-1 (at 42 cm) and OSL-2 (at 60 cm). Seventy-seven grains were dated from the lowest and presumably oldest of these samples OSL-2 (Shfd-12073), and finite mixture modeling returned three age components for the dated grain population. The component with the largest proportion of grains was dated 8,400±510 years BP, with 49% of the grains contributing to this component. The mean age of the grains in this sample was 10,604 years BP, and the youngest dated grain was 3282 years BP and the oldest grain was 32,777 years BP. In essence, none of the grains dated from this sample were as young as the artifacts within the sediment.

The uppermost OSL sample obtained from Stratum 4 was collected at a depth of 42 cm and 54 grains were dated (OSL-1, Shfd-12072). Finite mixture modeling identified four components, with an age of 3,600±230 years BP assigned to the most populous component, which represents 49% of the dated grains. The mean age of the sand in sample OSL-1 is 6,077 years BP, and the youngest grain dated was 1,785 years BP and the oldest was 27,861 years BP. About 74% of the dated grains were older than 3,200 years BP (the upper end of the age for *Kent* dart points).

Depositional Unit 2

Depositional Unit 2 comprises the upper 30 to 40 cm of the profile at the site and was radiocarbon dated during the testing phase (see Table 4). Two distinct strata were identified in the field, a slightly melanized (dark colored) bed at its base (Stratum 5), and a lighter colored upper part (Stratum 6) that was divisible into three parts (6a, 6b and 6c).

Stratum 5

This deposit typically exhibited a dark grayish brown color and a mottled or mixed appearance. Approximately 60% of the deposit was a dark grayish brown (10YR 4/2, moist) loam and 40% was a pale brown (10YR 6/3, moist) sandy loam. The mottled appearance was thought in the field to be the result of disturbance of the deposit by burrowing animals. The results of particle size analysis indicates that the texture of this deposit is intermediate between Stratum 6 and the underlying Stratum 4, and in both of the analyzed profiles a sharp break in texture occurs within this deposit, with Stratum 5 becoming much finer textured (similar to Stratum 6). A small but notable increase in organic matter appears in this deposit, which is consistent with the conspicuously darker color of this stratum. The field excavations did not excavate this deposit separately from Stratum 6 above it or Stratum 4 below, so it is difficult to be certain of the artifactual content of this deposit. But the microartifact columns provide a slightly clearer image of the content of this deposit and suggest that there are few or no prehistoric artifacts in Stratum 5.

Microfossils

As noted previously in the methods section, one of the most surprising discoveries made during the lab portion of this project was the presence of the calcified fruiting bodies of freshwater algae in the flotation fraction of the microartifact samples from XU 11. Once discovered, identified, and counted, it became apparent that the two *Chara* taxa exhibited a normal distribution centered on Stratum 5, and disappeared completely about 10 cm either side of this deposit (Figure 11). These plants, *Chara filiformis* and *Chara globularis* are small branching algae that live in fully aquatic conditions. They range from a few centimeters in height to almost half a meter, and generally grow in alkaline water less than 60 cm deep (Palacios-Fest 2010:400-401). The parts preserved are oogonia which have a calcium carbonate skeleton.

The significance of the presence of *Chara* here in a stratigraphically restrained context is interesting to ponder. Presumably, these plants grow in the channel of Mayde Creek and they may have been deposited here by overbank flooding of the creek, but their restricted distribution begs the question "what is different about Stratum 5?" Presumably, if they grow in the channel then they would probably be a common part of the overbank sediment assemblage during most phases of alluviation, including Stratum 4 below and Stratum 6 above. Their absence in Unit 1 is understandable when the age of this deposit is considered, and the fact that their calcium carbonate skeletons would most likely dissolve in a short period of time in a freely oxidizing low pH or acid soil. But their absence in Stratum 6 is more problematic. Does the presence of the *Chara* in Stratum 5, together with a slightly more organic rich sediment imply a period of more sustained inundation?

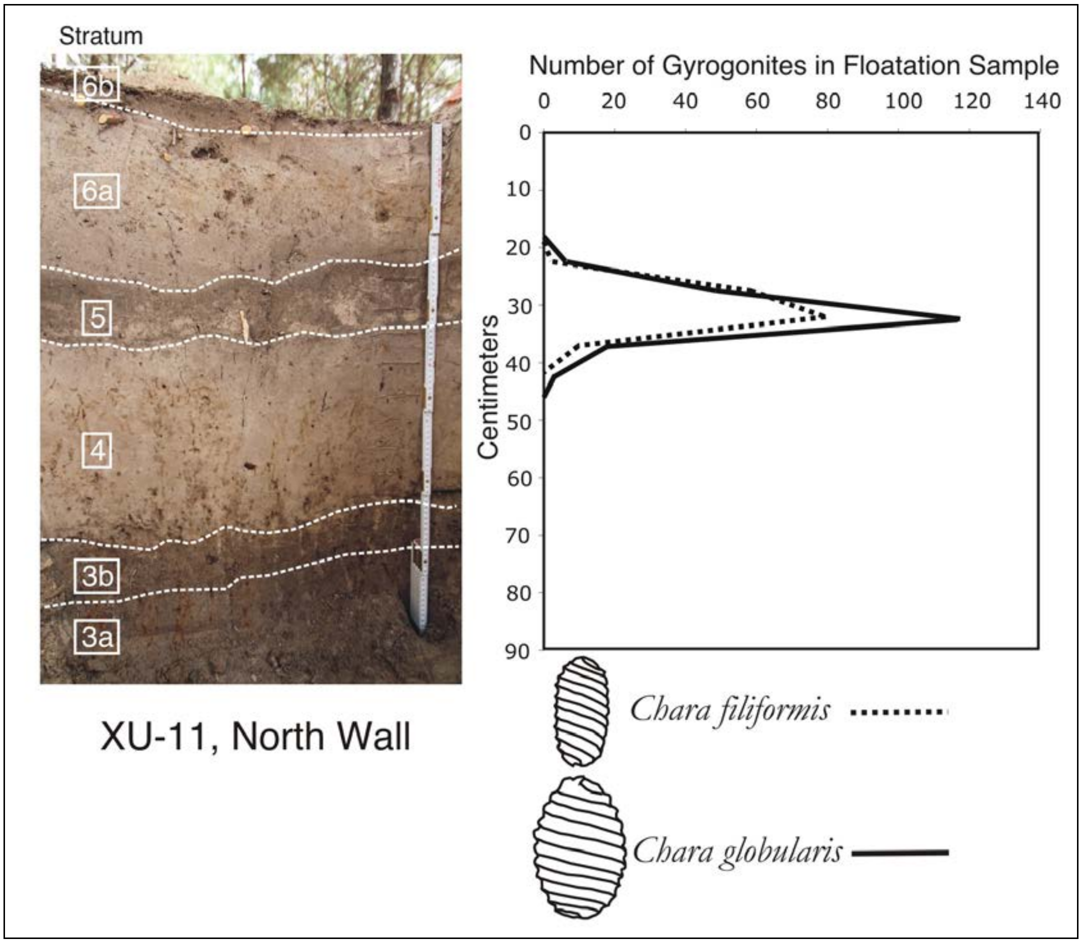

Figure 11. *Left side*: Photograph of the north wall of XU 11, labeled with respect to the strata present. *Right Side*: Plot of the depth distribution of two species of stonewort, *Chara filiformis* and *Chara globularis*, the lime encrusted gyrogonites which were found in the flotation fraction of the microartifact samples from this excavation unit. Plot is scaled to match the photograph.

Stratum 6

The uppermost 20 to 30 cm of the profile in the site is comprised by Stratum 6. The appearance of this deposit varied considerably across the small area of the site, and three variations are recognized, which are here termed Stratum 6a, 6b and 6c (Figure 12). In most places (Strata 6a and 6b) this deposit appears to be alluvium derived from Mayde Creek, but in one exposure this deposit was clearly introduced fill (Stratum 6c).

Stratum 6a

In its most common expression, Stratum 6 was dominated by light brownish gray (10YR 6/2, moist) very pale brown (10YR 7/3, moist) and pale brown (10YR 6/3, moist) very friable very poorly sorted loam. This deposit generally lacks structure and subtle color variations imply a substantial degree of mixing by soil flora and fauna.

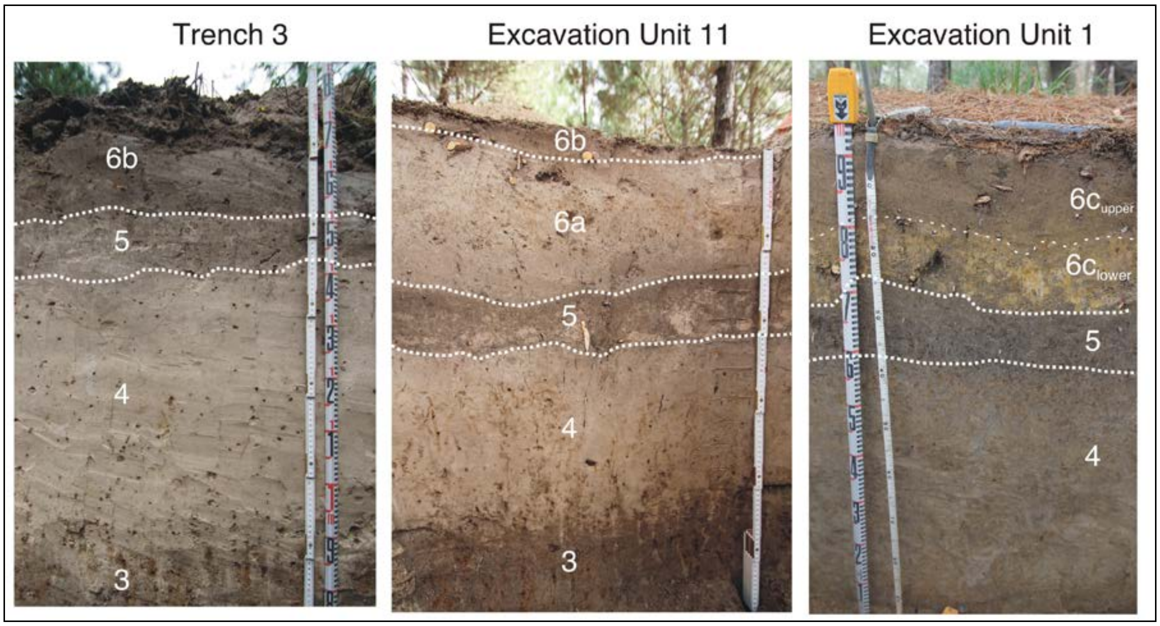

Figure 12. Three photographs showing variations in the appearance of Stratum 6, Depositional Unit 2. On the left side is a photograph of the north wall of BHT 3 showing a thick (25 cm) section of Stratum 6b capping the profile (note the relatively uniform dark color). The middle photograph shows the north wall of XU 11, where there is a thin band of Stratum 6b, resting on top of a thick (25 cm) section of light colored Stratum 6a, which in turn rests upon Stratum 5. The photograph on the right shows the west wall of XU 1 (from testing) where the entirety of Stratum 6 appears to be introduced fill. The yellowish colored blocks resting upon Stratum 5 are chaotically oriented fragments of argillic horizon (like Stratum 3 but most likely derived from an older deposit given that this fill also contains calcium carbonate nodules that were not observed within Stratum 3).

Stratum 6b

Elsewhere, this deposit occurs as a dark grayish brown deposit that started at the ground surface and extended to a maximum depth of about 25 cm, and appears to be an A-horizon. This darker colored variant is referred to as Stratum 6b. In some exposures

Stratum 6b was a thin (2-5 cm) dark grayish brown (10YR 4/2, moist) band immediately below the ground surface (see photograph of profile XU 11 in Figure 11) whereas in others it was much thicker and more homogeneous (as was the case in BHT 3 where Stratum 6b was a fairly uniform dark grayish brown (10YR 4/2, moist) loam with a few (1-3%) fine faint (3-5 mm) brown (7.5YR 4/4) mottles).

Regardless of its color, the naturally deposited variants of Stratum 6 are significantly finer textured than the upper part of Depositional Unit 1, Stratum 4, having significantly more silt and clay (see Figures 7 and 8). In both of the characterized profiles examined, Stratum 6 is finer textured near its base and coarsens slightly towards the top of the deposit. The organic matter at the top of Stratum 6 (just below the ground surface) is fairly high (at or slightly above 4%) and declines significantly through the deposit, approaching slightly greater than 1% near the base of the unit.

Stratum 6c

Although not present in the data recovery excavations, the testing excavations revealed upwards of 25 cm of introduced fill at the top of the soil profile that are here designated Stratum 6c. This fill was easily distinguished from the alluvium where it was composed of significantly different material, such as randomly oriented blocks of well-structured sandy clay derived from an argillic horizon (see Figure 12, photograph of XU 1, right side) but much less easily where it resembled Stratum 6b.

In testing phase XU 1, the upper 25 to 30 cm of the profile was composed of Stratum 6c. In the lower half of this deposit (labeled $6c_{lower}$ on Figure 12), where it rested directly upon Stratum 5, this deposit consisted of pale brown (10YR 6/3, m) to reddish yellow (7.5YR 6/8, m) sandy loam to sandy clay, firm, with moderate to strong medium subangular blocky structure, and contained a few 1-2 cm yellow (10YR 8/6) calcium carbonate nodules and common fine distinct strong brown (7.5YR 5/6) mottles. The upper 10 to 15 cm of this deposit (labeled $6c_{upper}$ on Figure 12), however, had a similar texture but a very different appearance. This dark grayish brown (10YR 4/2, m) sandy loam was very friable, exhibited weak fine to medium subangular blocky structure, and superficially resembled Stratum 6b.

The wide range of variation in the appearance of Stratum 6 implies that this entire deposit may be introduced fill, but in the two places where this deposit was characterized by lab work the properties are much closer to a naturally deposited alluvial sediment that has experienced slight pedogenic alteration (specifically organic enrichment) rather than introduced fill. Stratum 6 was radiocarbon dated during testing and both of these pieces of charcoal yielded ages that date to the last 150 years and with calibration indicate ages that extend back as far as AD 1670 (Table 4).

A small number of prehistoric artifacts were recovered from Stratum 6, but the significance of these is difficult to assess given that none of them were temporally diagnostic.

Table 4. Radiocarbon Dates Obtained from Stratum 6 During Testing.

Sample	Beta	Conventional Age	$\delta^{13}C$	2 Sigma Calibrated age
BHT 1, XU 2, 32 cm below surface, 44 cm below datum	318164	150±30	-27.3	AD 1670-1780 (cal BP 280-170) AD 1800-1890 (cal BP 160-60) AD 1910-1950 (cal BP 40-0) AD 1950-post 1950 (cal BP 0 to post 1950)
BHT 2, 30 cm below surface	318165	130±30	-24.07	AD 1670-1780 (cal BP 280-170) AD 1800-1900 (cal BP 150-50) AD1900-1940 (cal BP 50-0) AD 1950 to post 1950 (cal BP 0 to post 1950)

Discussion

The results of the geoarchaeological work done in association with the testing and data recovery excavations have provided several observations relevant to understanding the age and context of the prehistoric cultural material at 41HR1114. The most interesting results were derived from the luminescence dating and the microartifact analysis, both of which suggest that the Depositional Unit 1 deposits have experienced post-depositional disturbance.

Age of Deposits

The results of OSL dating were described briefly with respect to each stratigraphic unit, but here these results will be discussed in light of the artifact assemblage and vertical distribution of the artifacts. Although the OSL dating samples were collected from two different excavation units, it is easier to discuss the results with all of the samples plotted with respect to the strata (Figure 13). The depths for the top three samples are not quite correct on this illustration because of variations in the thickness of Stratum 4 between XU 11, where the top three OSL samples were collected, and BHT 3 (adjacent to XU 5). The principal issues we wanted to address by means of the OSL dating are: 1) the depositional age of this terrace deposit, and 2) were the artifacts deposited in a dynamic depositional setting or have they been buried by pedoturbation.

In general terms, evaluating the accuracy of an OSL age can be complex. It is assumed that the event we are dating, the resetting or bleaching of the sand grains that occurs upon exposure to sunlight, occurred during geological transportation of the sediment. Sedimentary deposits that fit this criteria typically exhibit unimodal age profiles that are not significantly skewed. Several processes, however, can result in polymodal or skewed age distributions, and all of these lead to erroneous OSL ages. The two most common are incomplete resetting or bleaching during transportation, and post-depositional mixing of the deposit. Some transportation processes, such as movement of sediment by flowing water in creeks and rivers, do not efficiently bleach all of the grains, and as such may yield single grain OSL age profiles that are skewed or polymodal.

When such circumstances are anticipated, and the deposit exhibits no evidence of post depositional disturbance (as indicated by the preservation of sedimentary structures or other forms of bedding) the youngest mode is assumed to represent the age of the transportation event, and the older modes are inferred to be the result of incomplete bleaching of the sediment during transportation.

The mixing of sedimentary deposits by post-depositional disturbance processes may also alter the grain age profile of a deposit and should be considered when there is no way to demonstrate that the sedimentary deposit is undisturbed. In fact, single grain OSL dating has been instrumental in demonstrating situations where the burial of an artifact assemblage has occurred through pedoturbative processes by highlighting age contrasts between the age of the artifact assemblage and the surrounding sedimentary matrix. In theory, if an occupation artifact assemblage is buried in an aggrading depositional setting, then the age of the artifacts will either be about the same age as or just slightly older than the sediments that bury them. However, if the artifacts are left on a non-aggrading surface where the rate of sedimentation is slower than the rate of internal reorganization of the deposit by fauna and flora, then burial by bioexhumation of sediment by animals (e.g. sediment spoil piles created by ants, termites and gophers), falling down voids left by the decomposition of roots, or physical mixing of deposits by burrowing animals can result in burial of the artifact assemblage. Where these post-depositional disturbance processes prevail, there are several tell-tale clues to the process, such as polymodal or skewed grain age distributions, and mismatches between the age of the artifact assemblage and the age of the matrix surrounding it.

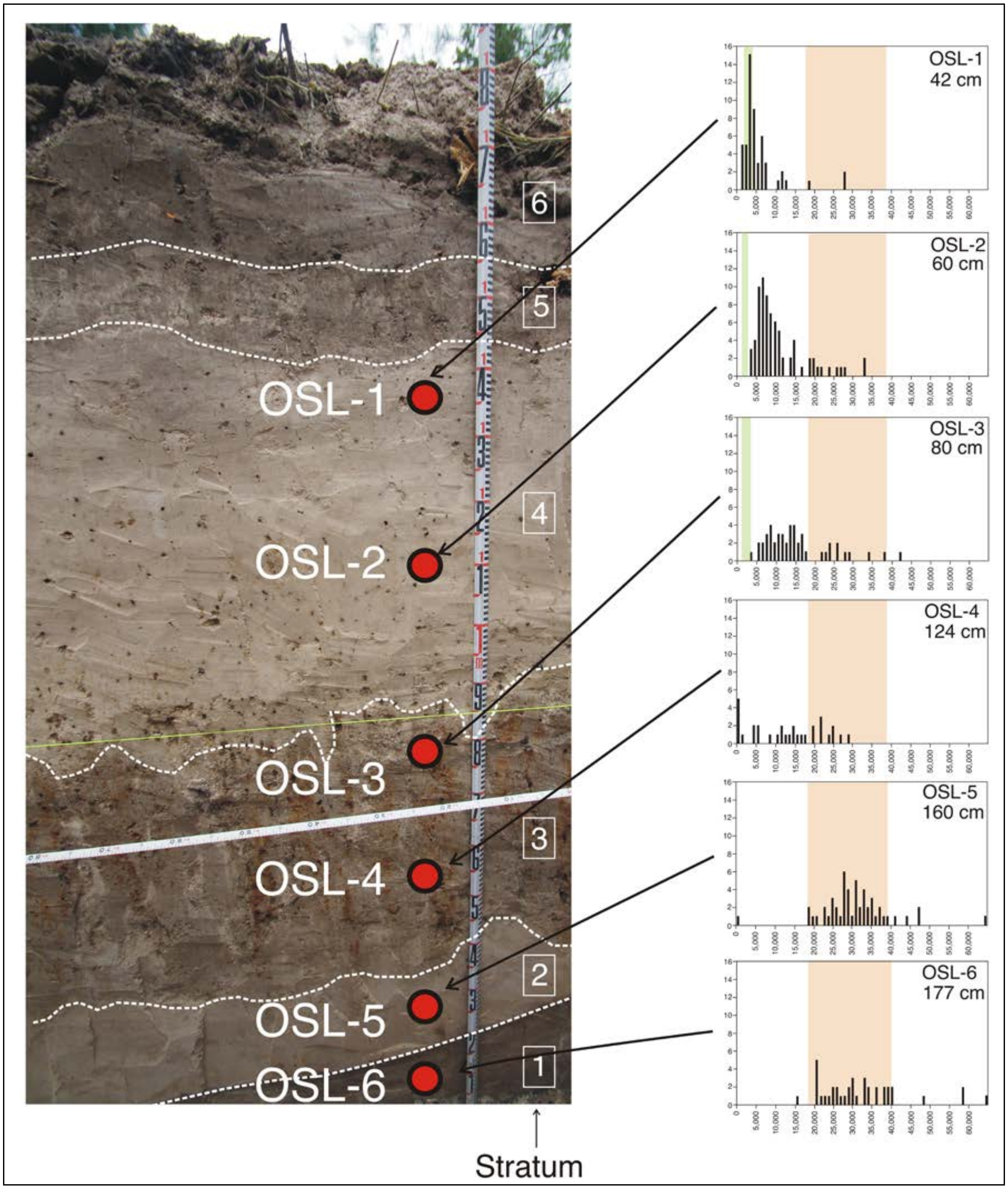

Figure 13. *Left side*: photograph of the deposits exposed in BHT 3, showing all of the major depositional units and strata identified at the site with respect to the locations of the OSL samples collected in the field. Note that there are discrepancies between the depths for the upper three samples which were collected from XU 11, where Stratum 4 is significantly thinner. *Right side*: Histograms showing the ages of individually dated sand grains from each OSL sample. Bin width for each column is 1000 years. Green shading on the left side is approximate age of diagnostic artifacts obtained from the same depth. Beige shading reflects the age of the core terrace deposit derived from the ages of the two lowest samples (OSL-5 and OSL-6).

With respect to using the OSL data to assess the depositional age of the deposits and the potential integrity of the assemblage it is useful to examine Figure 13 which shows the relative position of each OSL sample with respect to the site stratigraphy, and also shows grain age histograms for each single grain OSL sample dated. The grain age histograms permit visual assessment of the nature of the age profile of the deposit, and how that relates to the age(s) of the temporally diagnostic artifacts that were recovered from the excavation unit shown by green shading. The tan shading broadly brackets the age obtained from Stratum 2, which appears to be a reasonable representation of the period of transportation.

Age of the Core of the Terrace Deposit

The two lowest samples dated, OSL-5 and OSL-6, present a consistent impression that the deepest deposits excavated during the data recovery were deposited by Mayde Creek between approximately 20,000 and 40,000 years before present. Sample OSL-5 is perhaps the most accurate indicator of the age of this deposit owing to the fact that this sediment is clean sand that has not been a loci of deposition of illuvial clay. The finite mixture model analysis of the single grain age distribution identified a single mode and the age of that mode is 28,900 ± 1,100 years BP. Sample 6 below this yielded a less normal age profile and had a small tail of much older grains, but the resulting grain age profile is still consistent with alluvial sedimentation between 20,000 and 30,000 years ago. The finite mixture model identified a single mode in this sample as well, but the age (22,900 ± 1,100 years BP) is younger than that derived from the overlying sample OSL-5.

As noted previously, this apparent age reversal may be the result of the redistribution of clay in the soil profile by soil process known as illuviation. If this clay has a significantly higher dose rate than the sand, then the enrichment of the strata where this clay was deposited (specifically strata 1 and 3) will result in erroneously old OSL ages given that the formula by which an age is calculated is the paleodose (derived from measuring the OSL signal in the sand grains) divided by the dose rate. As such, if the paleodose is constant, then a smaller dose rate yields an older age and a larger dose rate gives a younger one. Examination of Figure 13 shows that the Stratum 3 has the highest dose rate values of all the samples and that Stratum 1 has a slightly higher dose rate than Stratum 2, which is the best sample to approximate to use to estimate the age of the deposit.

Regardless of which sample is closest to correct, both of these samples place deposition of the core of this terrace in the Late Pleistocene, between 20,000 and 30,000 years BP.

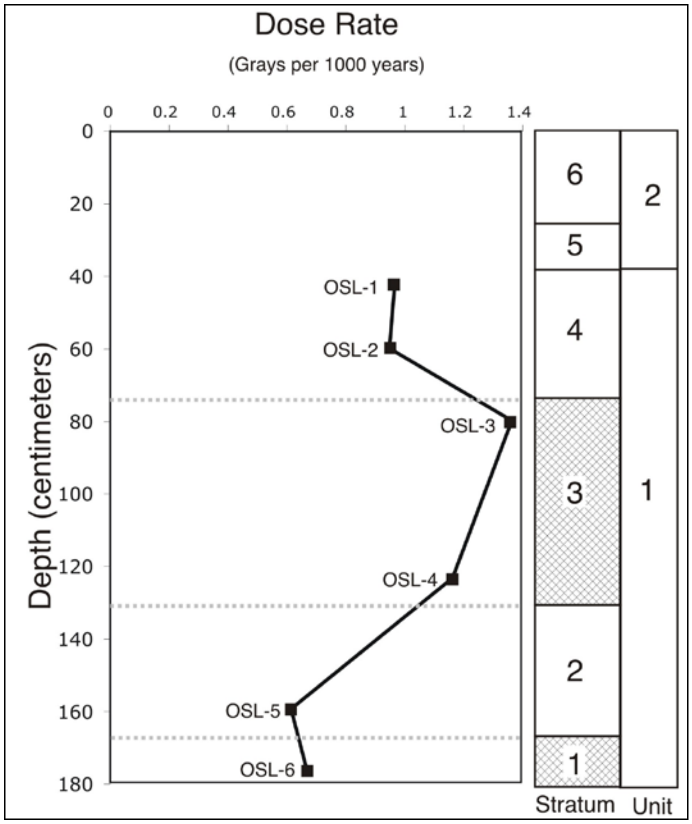

Figure 14. Plot of the dose rate versus depth. The dose rate is calculated from the concentration of uranium, thorium and potassium in the soil.

Implications of the OSL Dating on the Integrity and Burial of the Artifact Assemblage

In order to assess the implication of the OSL ages for site integrity and burial processes, we must examine the single grain age distributions from the portion of the profile that yielded temporally diagnostic artifacts, which are Strata 3 and 4, and the OSL samples 1, 2 and 3.

The only OSL sample that yielded sand grains close in age to the prehistoric artifact assemblage is OSL-1, near the top of the Stratum 4. Here, the young tail of the grain age distribution overlaps with the age of the diagnostic artifacts that were recovered from the excavation. Specifically, if we assume that 3,200 years BP is a reasonable upper limit age for the *Kent* point found about the same depth as this sample in XU 11, then 25% of the grains in this sample are younger than this. However, the finite mixture modeling of the grain age distribution identified four modes to be present in this sample, and these are readily apparent on the grain age histogram (Figure 13). The polymodality of the age distribution and clear skew towards older grains, however, suggest that this age profile does not represent a simple geologic transportation event, and could be the result of post-depositional disturbance or poor resetting during fluvial transportation. In the case of the latter, the youngest component identified by the finite mixture model was 2,000±230 years BP and is defined by 11% of the dated grains, which is a plausible for burial of a Late Archaic *Kent* component.

However, the implications of the OSL results for site burial becomes more clear as we proceed down the profile. Sample OSL-2 was collected from a depth of 60 cm in the middle of Stratum 4, about the same depth as the peak in the prehistoric artifact distribution in XU 11, which was found between 40 and 70 cm below the surface (Figure 8). Three diagnostic dart points were recovered from Levels 5 and 6, which bracket this depth (50 to 70 cm): *Ensor*, *Kent* and *Ellis*-like. All of the diagnostic artifacts in this zone are significantly younger than the matrix which surrounds them. The finite mixture model identified three components in the single grain age results, and the component represented by the most grains (49%) dated 8,400±510 years BP. Even the youngest component identified by the finite mixture model, 5,200±390 years BP (represented by 27% of the dated grains), is significantly older than the diagnostic artifact assemblage. Indeed, the mean age of the single grain population for sample 2 is 10,604 years BP. This mismatch in matrix age and artifact assemblage age favors a post-depositional disturbance burial mechanism.

By the time we get to OSL-3, which was collected from the top of the argillic horizon (Stratum 3) at a depth of 80 cm, the artifact distribution has started to decline in frequency, and the age of the matrix starts to increase significantly. Diagnostic artifacts collected from 70-80 cm in XU 11 include *Kent* and *Ellis*-like darts, which date to the late Holocene (younger than ~3,200 years BP). The finite mixture model identified three components in the single grain age distribution, the youngest of which is 8,400±690 years BP (34% of the dated grains), the intermediate is 13,900±1,000 years BP (40% of the dated grains), and the oldest is 27,900±1,900 years BP (22% of the dated grains). One grain out of 48 (age of 3,270 years BP) comes close to overlapping the old end of the age of the diagnostic artifact assemblage, but as with sample 2, the matrix is significantly older than the Late Holocene artifact assemblage. In addition to this, a significantly greater proportion of the dated grains fall into the age range of Stratum 2 (the third finite mixture model component is very close to the unimodal age of Stratum 2).

So in the portion of the profile where the OSL ages provide the most clarity on the depositional process it seems clear that the artifacts are significantly younger than the matrix in which they were found. This strongly indicates that the artifacts that comprise this site have been, as was suggested by some of the excavators, dispersed downwards into an older deposit by pedoturbation.

Microartifact Analysis

Microartifacts, here defined as those artifacts less than 4 mm in diameter, are traditionally not examined in most archeological studies owing to the onerous process of recovery and analysis, but have been used in a variety of ways to augment the interpretation of archeological residues. When recovered from a spatial grid across an occupation surface the distribution of microartifacts, especially when viewed in conjunction with the distribution of large macroartifacts may delineate activity areas that were subjected to periodic cleaning and removal of larger refuse on the floor (Sherwood 2001; Sherwood et al. 1995; Hull 1987; Dunnell and Stein 1989). Conversely, examination of the depth distribution of microartifacts, again contrasted with the distribution of macroartifacts, may show differences attributable to either removal of the microartifacts by geological processes such as wind or water, or post-depositional processes of pedoturbation (Sherwood 2001). It is in the latter context that the depth distribution of microartifacts was examined from the deposits of 41HR1114.

The re-organization of sedimentary deposits and soils by progressive post-depositional disturbance processes may result in a variety of patterns in the vertical and spatial distribution of artifacts that are completely unrelated to human behavior. For instance, burrowing animals move sediment and artifacts, but the effect on an archeological assemblage depends upon the size of the animal doing the digging. Small insects like ants, termites, worms and beetles typically only move material smaller in diameter than their bodies (cf. Balek 2002:46; Johnson 1989; 1987), so they may move the microartifact assemblage but leave larger artifacts undisturbed resulting in a size sorted assemblage. On the other hand, larger fossorial animals like gophers, moles and armadillos, can move the entire archeological artifact assemblages while digging and tend to homogenize stratified deposits by mixing together materials of different age. As a result two kinds of information are informative: the profile of the depth-frequency curve for each size of artifact, as well as the depth variation in the ratio of small to large artifacts (aka the microartifacts:macroartifact ratio), specifically in this case, debitage.

Observations in the field concerning the stratigraphic position of temporally diagnostic artifacts suggested that the site may have been affected by post-depositional pedoturbation, which led us to collect two columns of bulk sediment samples from which the depth variation of the large and small artifacts could be examined. One of these was collected from the north wall of XU 11 and the second was collected from the shared BHT 3/XU 5 wall. After the samples were wet sieved through a 2 mm sieve, the dry residues were separated into coarse (>4 mm) and fine (2 mm) fractions and analyzed under a low power binocular microscope. There they were separated into two main categories: 1) artifacts (only lithic debitage was common) and 2) iron-manganese concretions, and these were subsequently were counted and weighed. Following tabulation of the microartifacts present in each sample, the depth distributions were plotted (see Figure 15).

Theoretically, the expectations of this work depend upon the contextual scenario. If the occupation was buried in a dynamic geological environment by overbank sedimentation, then the artifact distribution should be stratigraphically discrete and bounded by sterile sediment. If, on the other hand the occupation was deposited on the ground surface near the top of Depositional Unit 1 and subsequently reached depth by post-depositional disturbance, the resulting profile will depend upon the dominant vector of mixing (see modeling examples of this by Brantingham et al. 2007; and Pierce 1992). Bioturbation by small animals who discard spoil on the surface and cannot move the large artifact assemblage will lead to the burial of the coarse artifact assemblage that will appear relatively discrete, stratigaphically, but the microartifact assemblage will be much more broadly distributed. Conversely, if the site is dispersed by large animal digging, then the large and small artifacts will most likely track together, and will show one of two patterns: a high at the former ground surface and an exponential decrease in frequency with depth, or a broad unimodal distribution that has very broad tails, and again with microartifacts and macroartifacts showing roughly the same distribution.

In both of the sampled columns, the microartifacts and macroartifacts tracked reasonably well together and the higher stratigraphic resolution of the microartifact samples permits resolving more detailed depth trends than are visible in the macroartifact collection from the test units, which were excavated in 10 cm levels. In both profiles, there is a single artifact peak high in the profile (around 10 to 20 cm in Stratum 6) after which the microartifacts drop to zero and the macroartifacts decline to low numbers (in both cases in Stratum 5). Below 30 cm depth both profiles exhibit a single broad artifact peak which reaches it maximum around 50 cm in BHT 3/XU 5, and between 50 and 70 cm in XU 11. The microartifact distributions in the BHT 3/XU 5 profile match well, with three modes apparent which decrease in size with increasing depth, and the uppermost of which occurs at the same depth as the peak in the macroartifacts. In XU 11, the microartifact distribution also exhibits three modes but they occur slightly higher than the mode in macroartifacts, the upper most peak appears to be at the very base of Stratum 5/Depositional Unit 2, but this boundary was not respected when the bulk samples were collected so some mixing across the interface may be present in this column. Alternatively, this may be due to subtle variations in the thickness/elevation of Depositional Unit 2. However, the decrease in microartifacts with increasing depth is consistent with an artifact assemblage that has been dispersed downwards by post-depositional pedoturbation.

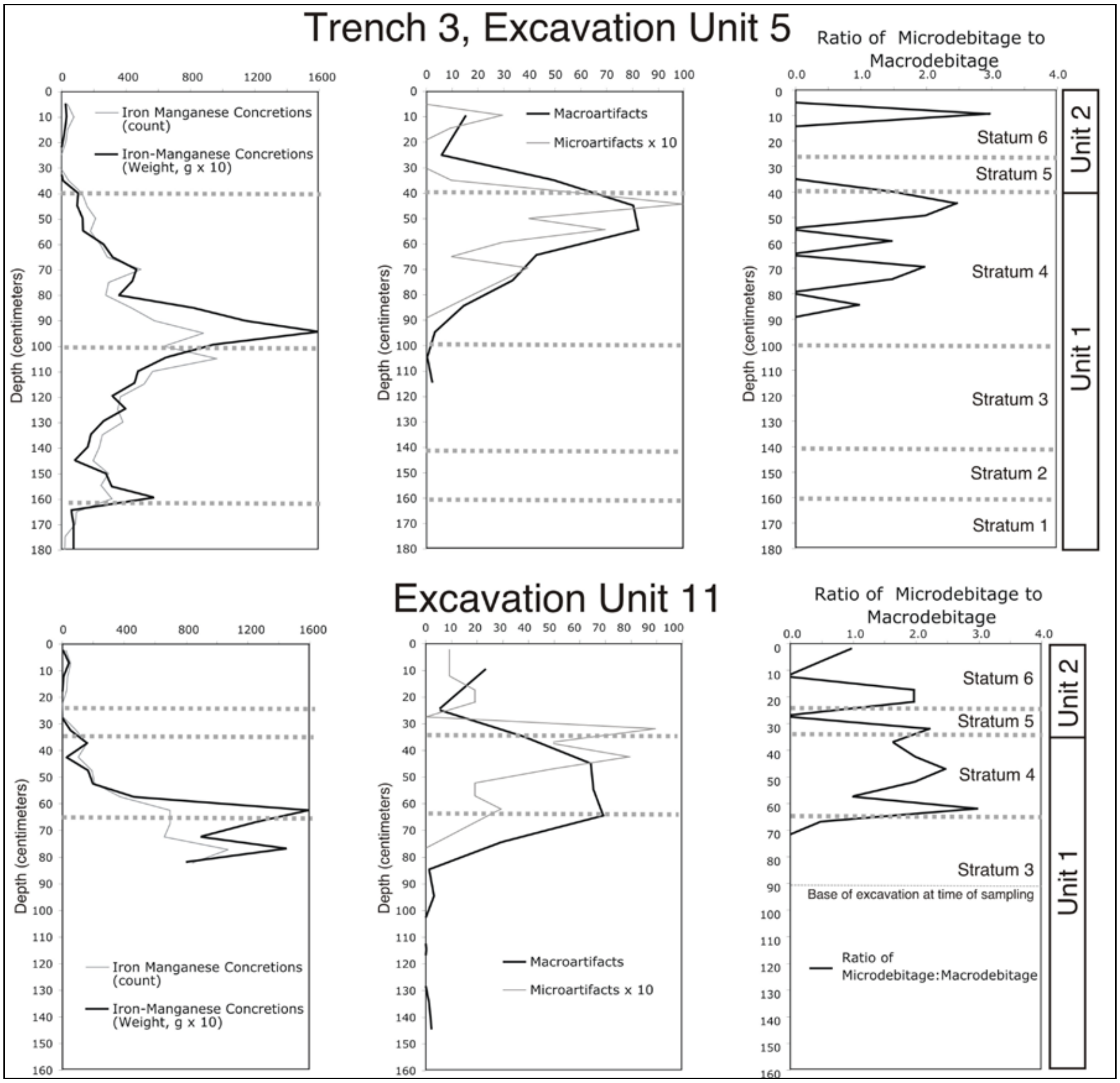

Figure 15. Bivariate plots depicting the depth variation in iron-manganese concretions, macro- and microartifacts, and the ratio of microdebitage to macrodebitage. Top panel shows the results from BHT 3/XU 5, whereas the lower panel shows the results for XU 11. Heavy dashed lines are the approximate depth of the boundaries between strata, labeled on the right side of the diagram.

In addition to examining the relative depth distributions of the two artifact size fractions, we can also look at the ratio of small to large artifacts as a function of depth, which provides a subtly different image of how the two size fractions vary with depth. Theoretically, if the artifact assemblage is undisturbed, then it will also exhibit a fairly constant ratio of microdebitage to macrodebitage, which reflects the size of debris created during knapping, although variations in the technical knapping process does result in some variation of this ratio (cf. Fladmark 1982). Progressive changes in the ratio of small to large debitage may indicate some process other than knapping has altered the composition of the artifact assemblage (for an example of this, see Morrow et al. 2012, who identify such a change in the micro-macro debitage ratio as indicative of a pervasive bias in the Friedkin site "Pre-Clovis" artifact assemblage).

Examination of the depth variation in the ratio of microdebitage to macrodebitage shows a saw-tooth profile which in the BHT 3/XU 5 profile appears to decline incrementally with depth, but the XU 11 profile shows the opposite trend. Most importantly, there is no clear and progressive change in the ratio with depth that would suggest that these two different size assemblages have moved separate from one another. Instead the ratio of fine to coarse debitage implies that if the assemblage was disturbed after deposition, the vector of disturbance did not discriminate between the two different sizes of artifacts, as one would expect from large animal bioturbation.

Finally, we examined the depth distribution of the iron-manganese concretions, which were one of the most common "coarse" constituents of the soils at the site. Iron-manganese concretions are a common soil constituent in the Houston area soils (see discussion in Abbott 2001:77-79) and are the product of periodic oxidation and reduction (or redoximorphic) conditions in the soil profile. In specific, alternating periods of saturation of the soil profile by water (when reduced conditions prevail in the soil and iron and manganese are moved in solution in the ground water) and drying (when the water table is lower and oxidation occurs in the soil profile and iron and manganese become fixed through crystallization) occur through time. Although the small concretions created by these processes are natural artifacts of pedogenesis in the soils, once they have formed they will be treated by most disturbance processes as rocks.

Therefore, the rationale behind looking closer at the depth distribution of these features is to see if all of the coarse fragments in the soil show evidence of having been re-organized by post-depositional bioturbation, or show trends one would expect to see that relate to the conditions that promote their formation *in situ*. In soils that have been extensively disturbed by post-depositional pedoturbation, often referred to as biomantles, one of the results of long term disturbance is an accumulation of large fragments at the base of the zone of pedoturbation, often referred to as a *stone zone* (cf. Johnson et al. 2005; Johnson 1989). The materials comprising the stone zone may include coarse fragments that were in the original geological deposit (such as gravel), artifacts from prehistoric human occupations as well as pedogenic features such as iron-manganese concretions. As can be seen in Figure 15, the trends are slightly different in the two profiles. In BHT 3, the iron manganese concretions peak between 90 and 100 cm about 40 cm below and clearly separate from the peak in artifacts (both macro- and microartifacts). In XU 11 however, the modal depth of the artifact distribution occurs at the same depth as the peak in iron-manganese concretions (between 60 and 80 cm). One of the few clear trends is the peak in iron-manganese concretions immediately above argillic horizons, where the water table may get perched for prolonged periods of time, which would favor the *in situ* formation of such concretions. In short, there is no consistent evidence of a stone zone created by bioturbation in these deposits. The XU 11 profile could be interpreted in this manner, but the pattern in BHT 3, where Stratum 4 is thicker, clearly shows that the peak in ironstone is different from the artifact peak, and in fact appears to be closely related to permeability barriers in the soil profile.

Summary and Discussion

Abbott (2001) notes that Late Prehistoric archeological remains are likely to occur in the deposits of small streams draining the Beaumont and Lissie Formations in the Houston region, but the occurrence of Archaic and older sites are less well understood owing to a paucity of studies of such streams. The work done at this site has advanced our understanding of the nature of the alluvial depositional record of such streams and the context of sites associated with deposits of different ages.

Understanding the alluvial record of such streams generally requires a good image of the local geomorphology, but the extremely low relief of the Houston area landscape, as well as the wooded nature of these lowlands often preclude such an understanding. The use of a LIDAR-derived digital elevation model to map the very low relief alluvial geomorphic features (floodplains and terraces) in the immediate vicinity of the site provided an excellent base from which the context of the site could be assessed. The LIDAR-derived geomorphic map also clarified the three dimensional arrangement (or alluvial architecture) of the Late Quaternary deposits of Mayde Creek, making it clear that this stream exhibits what Abbott (2001:102-105; after Waters and Nordt 1996) refers to as a type 4 or complex alluvial architecture. Given that the alluvial architecture and the chronology of alluvial sedimentation together strongly condition the nature of archeological visibility in riverine environments, documenting both attributes is important.

The use of single grain optically stimulated luminescence dating here has permitted both a chronology for the alluvial deposits as well as a means by which we can assess the integrity of the archeological assemblage. The sandy deposits of many Houston area streams often afford few opportunities to radiocarbon date the deposits as these sediments are typically freely drained and rapidly oxidize organic matter typically used for radiocarbon dating. The majority of the sediments present at this site (specifically Depositional Unit 1) would be either un-datable by radiocarbon, or only datable by using organic matter disseminated within the sediment itself, much of which has been contributed by post-depositional soil development processes and does not relate to the deposition of the sediments themselves. Hence, such "bulk sediment" radiocarbon ages are too young and fail to date events we would like to date (deposition of the sediment). Because OSL dating measures the time elapsed since the sediment was exposed to sunlight, it permits us to examine the time of sediment transport (which is when most of the grains are exposed to sunlight) as well as post-depositional processes like bio-exhumation by ants and other animals, but these two processes may only be separated if single grain OSL dating is used.

The results of the single grain OSL dating and detailed analysis of the site sediments revealed that two stratigraphic units are present at 41HR1114. The oldest of these, Depositional Unit 1, is an alluvial deposit of Mayde Creek, the sedimentation of which can be crudely bracketed by the OSL dates between 20,000 and 40,000 years BP. The younger deposit, Depositional Unit 2, is the product of recent sedimentation most likely during the last 200 years as two radiocarbon ages on charcoal collected from this deposit suggest.

The majority of the prehistoric cultural material was found in Stratum 4, the sandy upper part of a texture contrast soil formed in Depositional Unit 1 after this surface was abandoned by Mayde Creek in the late Pleistocene, sometime after ~28,900 years ago. Single grain OSL dates indicate that with the exception of the very top of Stratum 4, the artifact assemblage is significantly younger than the matrix in which it resides, and that this suggests these artifacts have been dispersed into the soil profile by bioturbation rather than buried by alluvial sedimentation. Examination of the microartifact assemblage indicates that this has occurred through the action of disturbance vectors that do not discriminate between large and small materials such as either digging by large animals like gophers, moles and armadillos and/or biotic processes like tree throw and roots rotting.

The work performed here also provides a useful reference point for understanding the stratigraphic position and appearance of Late Pleistocene and Early Holocene alluvium in the Houston region and how the soils formed in such deposits may appear. As Abbott (2001:79-80) has noted, the formation of argillic horizons in soils is time dependent and the property is one of the factors often used by geomorphologists, soil scientist and geoarchaeologists to assess the relative age of a sedimentary deposit based upon the degree of soil development. Unfortunately, there are very few dated studies that have documented the nature of the argillic horizons in light of the depositional age of the alluvium within which it has formed. For instance, Ricklis et al. (2001) documented the formation of an argillic horizon in sandy slope deposits in Lee County Texas that had >20% more clay than the parent material and this horizon formed in a period that was bracketed by OSL dating to 10,000 to 15,000 years. Using slightly different methods, Ufnar (2007) employed a combination of OSL dating and petrographic analysis of soil argillic horizons developed in Late Quaternary age alluvial deposits in Mississippi to assess the rate of argillic horizon development. Ufnar determined that significant argillic horizons, with more than 10% clay coats (or cutans) are typical of argillic horizons formed in alluvial deposits with depositional ages in excess of 20,000 years BP.

The OSL dating of the sediment beneath and within the argillic horizon at 41HR1114 provides the first such dates for the development of the argillic horizon in this region. The soil formed in Depositional Unit 1 at 41HR1114 exhibits an E/Bt-Btg-E-Bt profile and the petrographic examination of these deposits demonstrate that the argillic horizons contain features consistent with illuvial clay deposition (e.g. cutans or clay skins, clay bridges between grains, etc.). Analysis of the particle size distribution by hydrometer analysis demonstrates that the argillic (Btg) horizon here contains between 16% and 19% more clay than it had when it was originally deposited with by Mayde Creek, and this soil has formed in less than 20,000 years of pedogenesis. This provides a solid reference point for understanding what the pedogenic alteration of younger alluvial deposits in this region may look like.

Considered together, the use of multiple analytical methods here to understand the age of geologic deposition, nature of soil development, post-depositional re-arrangement and the contextual integrity of the prehistoric occupations provides a solid reference point for understanding archeological sites in similar settings in this region.

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CHAPTER 4
SOUTHEAST TEXAS CULTURE HISTORY

H. Blaine Ensor

Introduction

Various syntheses of the archaeology of Southeast Texas and the upper Texas Coast are currently available for interpreting the chronology, culture history, and lifeways of prehistoric and historic Native Americans (cf. Aten 1983, 1984; Patterson 1985, 1995, 1996, Ensor 1990, 1995, 1998, Shafer 1988; Story 1981, 1985, 1990). For example, Aten (1983:141-142) has divided the archeology of the upper Texas Coast into three periods: (1) Paleo-Indian (12,000 B.P. to 9,000 B.P.), (2) Archaic (9,000 B.P. to 3,000 B.P.), and (3) Late Prehistoric-Woodland (3,000 B.P. to A.D. 1700). These broad periods appear to correspond more or less with periods of major environmental change, i.e., (1) the Late Glacial, (2) post-Pleistocene adaptations with concomitant economic reorientation and population increase, and (3) cultural adaptation to essentially modern environmental conditions (Aten 1983:141-142).

Other researchers in Southeast Texas have put forth a number of prehistoric sequences or artifact chronologies based on the available archeological data. Story (1990) has provided her estimate of an artifact sequence for this area that parallels to a great extent those put forth by other researchers (e.g., Shafer 1988, Ensor 1990, 1998). Projectile point sequences outlined and proposed by Patterson (1985, 1991, 1995, 1996) diverge somewhat from the above chronologies in that a wider range of types from central Texas are proposed as being an integral part of the Southeast Texas sequence. In addition, Patterson's beginning and end dates, as well as period of duration and/or overlap for particular dart point/arrow point forms often deviate from estimates by the above researchers. This review will follow the sequences proposed by Story (1990) and Ensor (1990, 1991, 1998) for the upper Texas Coast (Table 5).

Table 5. Archeological Chronology for Southeast Texas (after Ensor 1991).

Time Period	Dates
Paleoindian	10,000-8000 B.C.
Early Archaic	8000-5000 B.C.
Middle Archaic	5000-1000 B.C.
Late Archaic	1000 B.C.-A.D. 400
Early Ceramic	A.D. 400-800
Late Ceramic	A.D. 800-1750
Historic	post A.D. 1750

Paleoindian Period

The earliest projectile points that are usually associated with the prehistoric occupation of Southeast Texas include occasional finds of fluted and unfluted Clovis points as well as fluted Folsom points. Recently, the estimated time range for Clovis occupation in Texas has been pushed back based on data from the Aubrey site near Denton (Ferring 2001) and the Wilson-Leonard site in central Texas (Collins 1998).

When these dates are coupled with recent ice core data from Greenland (Feidel 1999:95-115), it is now estimated that Clovis-Folsom occupations may date 2,000 years earlier than previously thought across North America. A time range from 13,500 to 14,500 years before present is now estimated for initial Clovis occupation of North America by many Paleo-Indian researchers. Traditionally, Clovis and Folsom points are thought to be followed in time by such unfluted lanceolates as Plainview, Golondrina, and Angostura as well as notched and unnotched Dalton and San Patrice points in Southeast Texas. However, recent work at the Wilson-Leonard site near Austin in central Texas has produced evidence that a corner-notched form termed Wilson follows the Clovis/Folsom occupations. An undefined component intervenes between the Wilson and Clovis occupations at Wilson-Leonard from 11,400-11,000 B.P. that most closely resembles Plainview or Folsom (Collins 1998). The Wilson period occupation (10,000-9500 B.P.) is in turn followed by such lanceolates as St. Mary's Hall and Golondrina/Barber/Angostura which date from 9500 B.P. to 8800 B.P. (Collins 1998:281). Plainview points are rare at Wilson-Leonard and may predate the St. Mary Hall's occupation as noted above.

Archaic Period

Further to the east, Early Archaic corner/side notched forms, along with San Patrice points, most likely represent a widespread regional notched haft technology that is primarily associated with early Holocene climatic events (cf. Goodyear 1982). San Patrice points (coeval with Dalton in the Eastern Woodlands [Ensor 1986]) are thought to be related to Webb et al.'s (1971) types A and B which have also been termed Keithville, varieties A and B (Story 1990, Webb 1981). These notched forms appear to follow San Patrice in time from at least 7500 B.C. up to about 6,000 B.C. The relationship of Wilson points to corner notched and side-notched forms further east such as those reported at the Crawford site in Polk County (Ensor and Carlson 1988), at 41FB19 (Patterson et al. 1987) and elsewhere (Story 1990; Patterson 1996) is unknown.

These types are followed during the Middle Archaic period by such expanded haft cluster types as Trinity, Yarbrough, and Carrollton. These point types are believed to date from circa 6,000 B.C. to 2,000 B.C. (Story 1990, Ensor 1990, 1998) but they are not well dated. These expanded haft cluster forms along with straight to slightly contracting stemmed Central Texas types Bulverde and Wells/Morrill points (Ensor 1998; Ensor and Carlson 1988, Patterson 1996) are also thought to fill a long temporal gap in the Southeast Texas Archaic sequence from about 6,000 B.C. to 2,000 B.C. Other Central Texas types such as Williams, Lange, Pedernales, and Travis also occur (cf. Ensor, 1990, 1998; Howard et al. 1991; Patterson 1995, 1996). About 2,000 B.C., the late Middle Archaic to early Late Archaic Palmillas type is introduced followed by Kent and Gary points during the Late Archaic/Early Ceramic periods (Ensor 1990, 1998; Story 1990). Recent excavations at the Eagle's Ridge shell midden, when coupled with data from Aten et al.'s (1976) Harris County Boy's School excavations, indicate that Kent points are confined almost exclusively to the Late Archaic period from 2800 B.P. to the beginning of the Early Ceramic (Clear Lake) period along the upper Texas Coast around 2400 to 2200 years ago (Ensor 1998). Kent points occur as a distinct regional lithic tradition that utilized primarily quartzite and silicified wood gravel for biface manufacture at Eagle's Ridge. This marks a distinct technological shift with earlier groups at the site who used principally high quality cherts for biface manufacture from Paleo-Indian through Middle Archaic times. A similar pattern has been observed throughout Eastern Texas with the use of non-local exotic cherts prevalent during the Middle Archaic (cf. Ensor and Carlson 1988; Gadus et al. 1992; Pertulla and Bruseth 1994; Fields 1995).

While no one culture adhered strictly to the use of a single raw material, there was apparently a shift from long distance regional chert procurement at the end of the Middle Archaic period to localized procurement during the Late Archaic and Early Ceramic periods at Eagle's Ridge and by inference much of the upper Texas Coast (Ensor 1998). Further to the north and east at the Alabonson Road site (Mueller-Wille et al. 1991), the percentage of silicified wood and quartzites versus chert used to make Kent points was the highest of all projectiles (about a third) even though chert was still the predominant material used in biface manufacture. This trend for an increase in chert use from east to west in Harris County has been noted by several researchers (cf. Ensor 2003; Moore 1995; Patterson 1996) and appears to be a direct function of availability and ease of procurement.

Gary points appear to have been introduced at Eagle's Ridge and other upper Texas coastal margin sites around the end of the Late Archaic period or 2400/2200 B.P. While Kent and Gary points share a close technological history (cf. Weber 1991, Ensor 1991, Patterson 1996), and may in fact be associated with initial formation of the Mossy Grove tradition (Moore 1995), data from these Texas coastal margin sites demonstrate clearly that stratigraphic/chronometric separation is possible at some sites (also see Story 1990:222 for a similar opinion). Further, the data from Eagle's Ridge clearly indicates that Kent points have a rather restricted temporal duration at this site since expanded haft cluster forms predominate at the virtual exclusion of Kent points in the lower portion of the midden. While some local variation may exist in the temporal distribution of these types in Southeast Texas, especially between inland and coastal sites, the preponderance of evidence to date suggests the above general sequence probably occurred over much of the area (cf. Story 1990). The question of *Gary* point or dart point extension into the Late Prehistoric and co-occurrence with arrow points is unresolved.

Early Ceramic/Late Prehistoric Periods

Story (1990) has noted a very generalized sequence for inland post-Archaic or Late Prehistoric sites. She refers to this as the Mossy Grove Tradition which later formed the core of Moore's (1995) dissertation. Story breaks with Aten (1983, 1984) and Shafer (1975) who referred to post-Archaic remains in Texas as Woodland. It has been pointed out by Ensor and Carlson (1988) that the Goose Creek pottery tradition most closely resembles Gulf Formational sandy paste and sand tempered ceramics of Louisiana and the greater Southeast in terms of decorative modes and paste composition (cf. Walthall and Jenkins 1976). In fact, a developmental sequence from the Gulf Formational types Tchefuncte and Mandeville (Walthall and Jenkins 1976; Weinstein and Rivet 1978) to Goose Creek Plain *var. Anahuac* and Goose Creek Plain *var. Unspecified* has recently been postulated by Ensor (1995, 1996, 1998) based on work at the Eagle's Ridge shell midden on the upper Texas Coast.

Archeological research at inland Mossy Grove sites has led to a two-fold division into an Early Ceramic period and a Late Ceramic Period (Ensor 1987, Ensor and Carlson 1991; Fields et al. 1983; Howard et al. 1991; Story 1990; Winchell and Wootan-Ellis 1991). The Early Ceramic period lasts from about A.D. 100 to A.D. 800 and is characterized by sandy paste Goose Creek Plain pottery and Gary points while the succeeding Late Ceramic period, which lasts from about A.D. 800 to A.D. 1750, is characterized by both sandy paste Goose Creek ware and grog tempered Baytown ware, as well as a variety of arrow point forms such as Scallorn, Alba, and Perdiz/Cliffton. Other aspects of post-Archaic period lithic assemblage are less well understood, however there appears to be an overall decrease in flake size from the Early Ceramic period to the Late Ceramic period (Ensor 1987; Ensor and Carlson 1988; Patterson 1985, 1995, 1996).

Archeological site distribution across the inland coastal prairie of Southeast Texas indicates that sandy, well drained-elevated soils along creeks and bayous were the favored locales that were repeatedly occupied (Ensor et al. 1983; Ensor 1987; Fields et al. 1986; Freeman and Hale 1978; Moore 1995, 1996; Patterson 1985). The floodplain and upland margins or scarps where older geologic deposits abut the floodplain are notably preferred site locations (cf. Ensor et al. 1983; Fields et al. 1986; Hall 1981; Moore 1995). The occurrence of sites far removed from a dependable water source on the upland prairie is rare (Ensor et al. 1983; Fields et al. 1986; Moore 1995, 1996). However, sites in the Greens Bayou drainage of eastern Harris County have shown a tendency to be located at greater distances from large streams than further west in Harris County (Ensor et al. 1990; Sanchez 2003). There are indications that a relatively stable environment has been in place across Southeast Texas for the past 4,000 years as noted above. The redundancy in settlement patterning noted by researchers along inland drainages is likely tied to intensive exploitation of the narrow band of riparian woodland that borders each stream (Ensor 1987). The result may have been the ubiquitous site clusters, either on sandy pimple mounds or other landforms that occur along the waterways.

Data from the Alabonson Road site, as well as other inland sites, suggest that minimally a dichotomous breakdown of sites into longer term residential base camps and shorter term extractive sites is evident (McReynolds, Ensor, and Korgel 1988; Ensor and Carlson 1991; Moore 1995). Moore (1995) further indicates that evidence of hunter-gatherer logistical activities (Binford 1980) within the riparian zone may indicate a more complicated pattern of resource extraction and scheduling of day to day activities than would be expected in a pure forager model and that a three-tier system of residential base camps, residential bases, and locations or temporary extractive locales may best fit the observed data (Moore 1995:189-190). Establishing criteria that enable the archeologist to empirically separate and/or test the validity of these hypothetical site types should be a major goal of on-going research. Cemetery sites are known for inland Southeast Texas with large Late Archaic cemeteries documented at Allens Creek on the lower Brazos River (Hall 1981). Data from Late Archaic cemeteries at Allens Creek suggest that widespread movement of exotic goods occurred during this period. Other burials occur in Addicks Reservoir at the Kobs and Doering sites (Wheat 1953) and isolated individuals have been found at more intensively occupied sites such as Alabonson Road (Ensor and Carlson 1991).

While there is evidence of long term stability in environmental conditions since the onset of the Late Holocene; there also exists paleo-environmental and archeological data that suggest short term environmental fluctuations. For example, the occurrence of bison kill sites across Southeast Texas (McReynolds, Korgel, and Ensor 1988), often in association with Perdiz arrow points, the presence of prairie soils in now heavily wooded areas (Ensor et al. 1990), and pollen data indicating climatic fluctuation (Beck et al. 2001), all suggest such change. Both Patterson (1985) and Ensor (1987) have posited that populations became more mobile during the Late Ceramic period at inland sites, possibly related to a drier climate and the expansion of prairies and prairie species.

Regarding the coastal situation, Aten (1983) has subdivided the coastal Mossy Grove sites (Late Prehistoric/Woodland period) into five prehistoric and three protohistoric sub-periods that span approximately 2,000 years along the upper Texas coast. The earliest of these he terms the Clear Lake period from A.D. 100 to A.D. 425 based on radiocarbon dating of early pottery assemblages. Tchefuncte, Goose Creek, and O'Neal ceramics predominate along with a minority of incised sherds. Gary dart points are often associated with Clear Lake period middens as are socketed bone projectile points (Story 1990). Recent data from the Eagle's Ridge shell midden (Ensor 1998) suggests that Aten's (1983) subdivision of the Clear Lake period into an early and late period based on varying amounts Goose Creek var. Anahuac and Mandeville pottery is correct. However some need for refinement is in order based on data from Eagle's Ridge. At this site, Mandeville Plain/Stamped and Tchefuncte Plain/Incised/Stamped pottery dominate the early portion of the Clear Lake period from 2,400/2,200 B.P. to 2,000 B.P. or slightly later. Goose Creek Plain var. Anahuac dominates the latter portion of this period from 2,000 B.P. to 1,600 B.P. or slightly later (Ensor 1998). Goose Creek Plain var. Unspecified predominates in post-Clear Lake contexts at Eagle's Ridge with a very small percentage of decorated ware along with a few arrow points.

Aten (1983) has noted that in the subsequent Mayes Island period from A.D. 425 to A.D. 650 that the ceramic assemblage consists almost entirely of Goose Creek Plain var. Unspecified with minor amounts of Goose Creek Incised. It has been surmised that stone dart points may have disappeared but that socketed bone points continue into this period (Story 1990). The next period, Turtle Bay, runs from A. D. 650 to A.D. 900. It is characterized by an increase in Goose Creek Red-Filmed and an elaboration of incised design motifs on Goose Creek Incised pottery (Aten 1983; Ensor 1995). It has been postulated that the bow and arrow first came into use during this period along the upper Texas coast and that socketed bone points fell into disuse.

Baytown-related grog-tempered ceramics (Phillips 1970) first appear around A.D. 1000 and mark the beginning of the Round Lake period (Aten 1983). Sandy paste Goose Creek ceramics decline during this period. The Phoenix Lake variety of Goose Creek, which is characterized by a dense grog paste, is thought to predominate by the end of this period at about A.D. 1350. Perdiz/Cliffton arrow points are common and microlithic drills or perforators become more visible in the archeological record. The final prehistoric period has been termed the Old River period by Aten (1983). It lasts from about A.D.

1350 until A.D. 1700 and is characterized by an increase in Goose Creek sandy paste pottery and the decline of Baytown grog tempered ceramics (Aten 1983). Bone tempered pottery is introduced and Perdiz arrow point become more pervasive during this period (Aten 1983; Ensor 1995; Story 1990). The Old River (prehistoric) period is followed by the Old River (protohistoric) period, the Early Historic Orcoquisac period and the Late Historic period (Aten 1983).

The subject of Mossy Grove coastal settlement patterning has been discussed by several researchers (cf. Aten 1983; Ensor 1987, 1998; Gadus and Howard 1990; Moore 1995; Patterson 1995, 1996; Story 1985, 1990). Most would agree that beginning with the Late Archaic period or certainly by 2000 years ago that two distinct settlement systems were in place; a coastal and an inland pattern (Aten 1983; Ensor 1998; Ensor and Carlson 1991; Patterson 1995, 1996; Moore 1995; Story 1990). The establishment of modern environmental conditions by 4,000 years ago over Southeast Texas seems to coincide with the establishment of an inland/coastal settlement dichotomy. Articulating different site types between coastal and inland settings and defining their range and variation has been somewhat problematic. Gadus and Howard (1990), based on work at Peggy Lake, suggest that longer term residential camps and shorter term extractive camps (littoral harvesting stations) were present on the coast. This mirrors somewhat the longer term Type I sites and shorter term Type 2 sites defined for inland site types (McReynolds, Ensor, and Carlson 1988). Story (1990) describes a minimum of three site types in coastal settings (1) bay margin or barrier island camps, (2) shorter term sites used in transit between major sites (hunting/foraging camps), and (3) inland riverine camps that served as places to exploit fresh water stream, woodland, and upland prairie species (Story 1990:268).

Patterson (1995, 1996) has postulated that a 15 mile wide strip along the coast was exploited by local populations and formed the basis of a littoral settlement pattern. Prior to the Late Archaic period, there is evidence that population densities were lower and that the need for social mechanisms to deter group movement between inland and coastal areas were diminished (Aten 1983). Evidence from Eagle's Ridge suggests that such movement did occur on a regular basis during the Early to Middle Holocene and that populations densities were lower (Ensor 1998). The question of degree of interaction between coastal and inland groups, the position of group territories or boundaries, and how specific site types may relate to one another are unclear. Late Prehistoric cemetery sites are common along the coast (Aten 1983; Patterson 1996). Sites such as Harris County Boys School (Aten et al. 1976) and 41GV66 on Galveston Island (Ricklis 1993, 1994) contain a variety of grave goods. Cemeteries and scattered burials with grave goods also occur at more inland locations such as at sites 41FB11, 41FB13, and 41FB255 in Fort Bend County (Walley 1955; Rogers et al. 2000).

Ceramic artifacts appear in the archaeological record of the Galveston Bay area by approximately A.D. 100, and by A.D 500, had been adopted by a number of inland populations (Pertulla et al. 1995). A plain, sand-tempered type of ceramic identified as Goose Creek became prevalent during the period, although a number of decorated varieties and tempering materials were also present (Patterson 1995; Pertulla et al. 1995).

The appearance of Caddoan pottery in southeast Texas around A.D. 1000-1300 has been used to suggest the presence of extended trade networks or migration during this time (Aten 1983). The period has also been associated with the introduction of the bow and arrow around A.D. 600 (Aten 1983).

Historic Overview

European settlement did not begin to seriously disrupt aboriginal habitation in the areas in and from the Upper Texas Coast until after AD 1700 (Aten 1983; Patterson 1995:249). European diseases, probably introduced by explorers and early traders, did begin to have impacts as early as AD 1528. At least 7 epidemics were recorded among the tribes of the study area between that date and AD 1890 (Ewers 1974). The project area appears to have been on the boundary of the territories of several Native American groups in the eighteenth and nineteenth centuries. Groups that may have resided in Harris County include the Atakapan, Akokisa, Karankawa, Bidai, and the Tonkawa. During the eighteenth and nineteenth centuries, epidemic diseases, the mission system, and the fur trade acted to severely reduce, and in some cases exterminate, the indigenous populations.

The upper Texas Coast and Harris County were, in general, sparsely populated in the early 19th century; neither the French nor the Spanish settled the area to any great extent (Freeman 1990). Some early settlement occurred along the San Jacinto drainage (Gilbert 1963). However settlement increased at Harrisburg (Houston) after the land grants were issued to members of Austin's colony. Despite setbacks during the Mexican revolution, a land office was set up in Houston, the new county seat, in 1838 (Freeman 1990:13). The Board of Land Commissioners then made land grants which enabled the establishment of numerous small farms, large ranches, and plantations along local waterways. Lumbering and cotton quickly took hold after 1880 as the mainstay of Houston economy as many absentee landowners and speculators held large parcels of timber. Prior to this, stock-raising had been dominant (Carlson 1983). The industrial base was expanded to support the highly profitable timber industry. Railroads were built to handle increased cotton and timber shipments during the late 19th century and a large German immigrant population settled in western and northern Harris County. A deep water port and the Houston Ship channel were established during the early 20th century and the discovery of oil in the area at about the same time led to economic good times for the area (Freeman 1990). Cotton continued as an important export through the 1930's and with the introduction of improved technology, rice cultivation became feasible on previously uncultivated land (Carlson 1983). The advent of automobile transportation, the development of the service industries, and increased participation in a global marketplace insured that Houston and Harris County were gradually transformed into the thriving urban areas we see today.

European contact in the region began in the early 16th century with the ill-fated Narváez expedition that, in 1528, deposited Cabeza de Vaca onto the Texas coastline, possibly on Galveston Island. More long-term contacts resulting from permanent European settlement did not directly impact aboriginal lifeways in southeast Texas until the early 18th century (Patterson 1995). However, European diseases introduced by explorers and early traders had begun to affect Native American populations in Texas by the 16th century (Ewers 1974). Throughout the eighteenth and nineteenth centuries, epidemic diseases, the mission system, and the fur trade seriously reduced, and in some cases exterminated, the indigenous populations residing in the region.

Anglo-American settlement in the Harris County area began in the early 1820s, with a number of Mexican land grants awarded in 1824 (Henson 1996). The modern boundaries of the county were established as Harrisburg County by the Texas Congress in 1836, and it was renamed Harris County in 1839. The presence of the highly navigable Buffalo Bayou stimulated economic development of the county, and of the city of Houston in particular. The establishment of six railroad lines in the area prior to the Civil War further stimulated economic prosperity, and helped lure a steady stream of settlers to the region. By the second decade of the 20^{th} century, the growing gas and oil industry was competing with agricultural interests, and helped create a significant boom in population.

CHAPTER 5
PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

Prior to beginning field investigations, Moore Archeological Consulting, Inc., performed a background investigation of archeological and historical literature relevant to the project area. Literature examined for this project includes site inventory records on file at TARL, previous archeological investigative reports on file at the Texas Historical Commission (THC) and Moore Archeological Consulting, Inc. and other published literature pertinent to the current project.

41HR1114 is located 120 m west of South Mayde Creek, a tributary of Buffalo Bayou, and is in close proximity to the Addicks Reservoir. Some of the earliest archaeological investigations in Harris County occurred along Buffalo Bayou and its tributaries in association with efforts to channelize the watercourse, and in preparation for the construction of Addicks Reservoir (Wheat 1953; Neyland and Worthington, TARL site files). During 1947, Wheat (1953) conducted a series of surveys and excavations (Fields et al. 1983) of areas within the reservoir impoundment zone and along the creek banks of several nearby watercourses, including South Mayde Creek. During the late 1950s, Neyland and Worthington, two local avocational archeologists, conducted surveys along Buffalo Bayou in preparation for several flood control projects (Prikryl 1997; TARL site forms).

Following these early investigations, extensive site location and recording efforts were conducted during the 1970s and 1980s by Leland Patterson and members of the Houston Archeological Society (HAS). The old channel of South Mayde Creek had been examined in 1972 as part of a larger survey conducted by Patterson and John H. Herbert of HAS. This survey resulted in the recording of a number of sites within both privately owned and USACE property along the old channel. No subsurface testing was conducted at that time.

More recent investigations related to the proposed expansion of Park Row Boulevard begin with a 2003 reconnaissance-level survey by Perennial Environmental Services (Garcia-Herreros 2003). Conducted for Aviles Engineering Corporation on behalf of the City of Houston and the Texas Department of Transportation (TxDOT), the reconnaissance survey examined approximately 4132 ft (0.9 mile) of the total 1.2 mile long proposed ROW, which appears to have been very similar to the currently proposed project. A total of 14 shovel tests were excavated along the ROW, resulting in the limited recovery of modern refuse. No archeological sites were identified during the survey, and no further archeological investigations were recommended.

Involvement by Moore Archeological Consulting, Inc., began when interest in extending Pak Row Boulevard was resurrected in 2012 by the Wolff Companies, Houston, Texas (Moore and Driver 2012). In February of that year, a pedestrian survey was conducted along most of the proposed approximately 5000 ft (ca. 1524 m) long, by 120 ft (36.5 m) wide ROW. The land was privately owned at the time of the survey. Therefore, neither the Antiquities Code of Texas nor Section 106 of the National Historic

Preservation Act of 1966 mandated the survey. Rather, it was carried out as proactive due diligence as a key element of the future regulatory requirements for a private development project on an ambitious development schedule. Excluded from the alignment survey was the ROW crossing of the USACE, Galveston District, property flanking both banks of the artificial Langham Creek outfall channel for the Addicks Reservoir. A total of 84 shovel tests were excavated during the survey, and three archeological sites were identified, 41HR1114, 41HR1115, and 41HR1116. 41HR1115 was determined to be an ephemeral site, and not recommended for further work. In contrast, both 41HR1114 and 41HR1116 exhibited intact deposits that contained high densities and diversity of cultural materials. Consequently, further archeological work was recommended for both sites 41HR1114 and 41HR1116 to determine their eligibility for the National Register of Historic Places (NRHP).

In March and April, 2012, significance testing was conducted at the two sites, and included both hand excavation and geoarcheological trenching investigations conducted by Dr. Charles Frederick. Four 1 x 1 m units and two backhoe trenches were excavated at 41HR1114. At 41HR1116, only a 30 m wide strip of the site's western edge was accessible between the South Mayde Creek stream channel and the USACE property boundary. Consequently, only one 1 x 1 m test unit and one backhoe trench were excavated. At both sites, the artifact assemblage and documentation of intact sediments indicted the potential for further research. Consequently, 41HR1114 was recommended for data recovery excavations, and additional survey and delineation investigations were recommended for the portion of 41HR1116 located within the USACE property. Data recovery excavations at 41HR1114 were conducted in June 2012, under Texas Antiquities Permit 6274 (the project corridor had become Harris County Improvement District No. 4, DBA Energy Corridor Management District jurisdiction by that time), and are the subject of the current report.

In October, 2012, a linear pedestrian survey was conducted along a proposed access road ROW linking the Park Row road alignment with the Interstate 10 feeder road. A total of six shovel tests were placed along the 980 by 145 ft (ca. 299 x 44 m) ROW (Driver 2012). No cultural materials were identified and no further work was recommended.

A pedestrian survey of a 9-acre tract located between the proposed Park Row Boulevard and the Addicks Reservoir embankment was conducted in December, 2012 (Driver and Moore 2013). A total of 55 shovel tests were excavated, along with five backhoe trenches. The survey documented the northern extent of previously-identified 41HR1114, and identified two new sites, 41HR1132 and 41HR1133. The trenching and screening of matrix samples from these two sites indicated they both consisted of shallow deposits that contained low artifact density and diversity. No further archeological investigations were recommended for sites 41HR1132 or 41HR1133. As for 41HR1114, due to its proximity to the data recovery excavations conducted there in June, 2012, no additional work at that site was recommended.

However, in the unlikely event that any cultural materials (including human remains or burial features) are inadvertently discovered at any point during construction, use, or ongoing maintenance of the Project Area, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the Texas Historical Commission (THC) should be notified of the discovery.

CHAPTER 6
FIELD INVESTIGATIONS

Introduction

The testing and data recovery field investigations at 41HR1114 were conducted from February 27-March 15, 2012 (testing), and from June 11-25, 2012 (data recovery). A total of sixteen 1 x 1 m hand units (XU 1-16) were excavated. XUs 1-4 were conducted as distinct 1 x 1 m units (XUs 1, 2, and 4 were placed adjacent to trenches) during the testing, while the remainder of the hand excavations were conducted as two 2 x 3 m block excavations (subdivided into XUs 5-10 and 11-16) as part of the data recovery phase. Three backhoe trenches (BHTs 1-3) totaling 45 m in length were excavated, two during the testing phase and one during the data recovery operations.

The site was initially identified by 14 positive shovel tests conducted within the Park Row Boulevard expansion project ROW (Moore and Driver 2012). Delineation of the site was restricted to the 36.5 m (120 ft.) wide ROW area of potential effect (APE). The delineation determined that the east-west dimension of the site measure 60 m in width, and while it extends completely across the APE (and slightly beyond it to the north, as STs 51 and 54 were mistakenly placed outside the unstaked ROW boundaries), its north-south dimensions were unknown at the time of the testing and data recovery excavations.[1]

The shovel tests recovered a total of 153 artifacts from Levels 1-10 (0-100 cmbs), with the highest densities of artifacts in Levels 4-8 (30-80 cmbs). The artifacts included one chert *Kent* dart point (ST 54, Level 8), 145 pieces of lithic debitage (140 chert, 5 silicified wood), six Goose Creek plain pottery sherds, and one fragment of burned clay. The *Kent* dart point and the presence of ceramic materials initially suggested a Late Archaic (1000 BC-AD 400; see Chapter 7 for description and dating of Specimen 1) to Early Ceramic period (AD 400-800) date for the site's occupation.

At the client's request, additional investigations were undertaken immediately to determine the site's potential NRHP eligibility. Two backhoe trenches (BHTs 1, 2) were excavated and evaluated by Dr. Charles Frederick, a geoarcheologist with extensive experience with the soils of Southeast Texas. Four 1 x 1 m hand excavation units (XUs 1-4) were excavated, two placed adjacent to BHT 1 and one at BHT 2. The results of the testing excavations indicated that the site deposits were intact and well-preserved, and that the geomorphological context of the site had the potential for contributing to our understanding of the processes involved in site deposition commonly encountered in Southeast Texas.

A short time after the testing excavations were completed, the development project was subsumed within the Harris County Improvement District No. 4, DBA

[1] A later survey for a 9-acre tract adjacent to the north side of the ROW determined that the northern portion of the site extends an additional 35 m beyond the ROW (Driver and Moore 2013). No additional work has been conducted south of the ROW.

Energy Corridor Management District, and further investigations fell under the jurisdiction of the Texas Historic Commission (THC) permitting process. While the results of the survey investigations were submitted to THC in complete report form, data from the testing phase was still undergoing analysis at that time, and a summary of the work has only been provided in a limited, interim report submitted as part of the data recovery permit application. Consequently, the current report will include descriptions of both the testing and data recovery investigations. Further, to ensure the most complete dataset for material culture interpretation, the lithic analysis included all artifacts recovered from the survey, testing, and data recovery phases.

Subsequent testing and data recovery excavations included 16 square meters of hand excavation units and 43 m of backhoe trenching, and produced a total of 3863 artifacts. The recovered materials includes 32 whole and fragmented dart points, one unidentified projectile point fragment,15 bifaces and biface fragments, one retouched flake, one chopper, one core, eight utilized flakes, 3696 pieces of lithic debitage, 58 Native American Prehistoric ceramic sherds, seven fragments of burned clay, and 16 fragments of faunal bone. The point types include *Bulverde*, *Ellis*, *Ensor*, *Gary*, *Godley*, *Kent*, *Palmillas*, and *Yarbrough*. These types, in conjunction with the presence of ceramics and the lack of arrow points, indicate occupations at the site spanning the Middle Archaic to Early Ceramic periods.

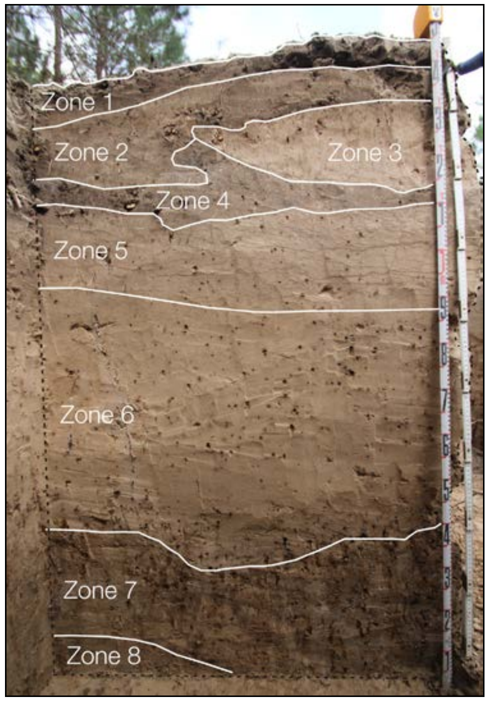
While vegetation within the area around the site consisted mostly of open pasture with small clusters of trees, a significant portion of the site was located in an area that had been used as a commercial pine tree nursery. The pines were planted in straight rows, at intervals of approximately 10 ft. The trees that remained were mature, with approximately 10-12 in diameter trunks. As would be expected, the tree roots systems had created significant disturbance in the upper 30-40 cm of the soil profile.

Results of Testing and Data Recovery at 41HR1114

Significance Testing Investigations: Backhoe Trenches

The testing investigations began with the excavation of two backhoe trenches (BHTs 1, 2) as part of the exploration of the geoarcheological potential of the site. BHT 1, initially a 20 m long, north-south oriented trench, was placed in the eastern end of the site, while BHT 2, a 10 m long trench also oriented north-south, was placed in the western end of the site. A potential feature identified near the center of the east wall of BHT 1 resulted in the excavation of a short, 5 m long perpendicular trench and a 1 x 1 m excavation unit (see XU 2 description below).

The trenches revealed a similar stratigraphy (Figure 16) in both areas of the site that consisted of a 20-30 cm thick upper plowzone deposit (Zones 1-3) that consisted of introduced modern fill in some areas of the site, but alluvium from Mayde Creek in others (Frederick and Gregory, interim report). Further analysis during the data recovery phase (see Chapter 3) would result in the designation of the former as Stratum 6c, and the latter as Strata 6a (highly bioturbated) and 6b. Beneath this was Zone 4, a thin veneer of dark gray loam that would be designated as Stratum 5. This was underlain by Zones 5 and 6, two layers of grayish brown to pale brown sandy loam that totaled 70 cm in thickness, and would later be combined into Stratum 4. This was followed by Zones 7 and 8, an argillic horizon of red to strong brown sandy clay at 91 cmbs that initially appeared to be the basal subsoil (possibly Lissie). Later analysis would designate these as Strata 3 and 2, of Depositional Unit 1. Samples collected from a charcoal scatter at depths of 32 cmbs (BHT 1/XU 2) and 30 cmbs (BHT 2/XU 3) returned dates of 150±30 and 130±30, respectively (Beta-318164, Beta-318165). Frederick suggested that this material may represent historic period land-clearance that occurred in the area during late 19th century (Frederick and Gregory, interim report).



Zone	Depth (cm)	Horizon	Stratigraphic Unit	Description
1	0-9	Ap	Depositional Unit 2, Stratum 6c	Black (10YR 2/1, m) sandy loam, very friable, weak medium subangular blocky structure, abrupt smooth boundary, non-effervescent, appears to have been disturbed by vehicular traffic.
2	9-34	AC	Depositional Unit 2, Stratum 6c	Dark grayish brown (10YR 4/2, m) sandy loam, very friable, massive, abrupt wavy boundary, non-effervescent, few (2-3%) fine faint dark yellowish brown thread-like mottles, few fragments of gray (2.5Y 5/1, m) clayey sand which could be fragments of argillic horizon.
3	20-31	C	Depositional Unit 2, Stratum 6a	Very pale brown (10YR 7/3, m) loamy sand to sand, loose, single grain, abrupt smooth boundary, non-effervescent, fills a linear, roughly N-S oriented channel like depression, but exhibits no obvious bedding.
4	34-45	AC	Depositional Unit 2, Stratum 5	Dark gray (10YR 4/1, m) sandy loam, friable, weak medium subangular blocky structure to massive, clear smooth boundary, non-effervescent, common fine distinct yellowish red (5YR 4/6) irregular shaped mottles.
5	45-62	E/Bt	Depositional Unit 1, Stratum 4	Pale brown (10YR 6/3, m) sandy loam, very friable, massive gradual smooth boundary, non-effervescent, few (3%) fine (2-3 mm) prominent black manganese concretions, few to many 1-3 mm thick wavy to irregular grayish brown to dark gray clay lamellae.
6	62-120	Eg	Depositional Unit 1, Stratum 4	Very pale brown (10YR 7/3, m) sandy loam, very friable, massive, clear wavy boundary, non-effervescent, few fine (1-3 mm) faint strong brown (7.5YR 4/6) irregular mottles, common (10%) medium (2-5 mm) prominent black (N 2/0) to reddish brown (5YR 4/4) spherical iron-manganese concretions.
7	120-143	Btg	Depositional Unit 1, Stratum 3	Gray (10YR 6/1, m) sandy loam to sandy clay, firm, weak medium prismatic structure parting to moderate medium subangular blocky structure, abrupt wavy boundary, non-effervescent, many fine to coarse prominent yellowish red (5YR 4/6) irregular shaped to thread-like mottles, many fine distinct black (N 2/0) spherical manganese concretions.
8	143-160+	C	Depositional Unit 1, Stratum 2	Pale brown (10YR 6/3, m) loamy sand to sandy loam, very friable, single grain, non-effervescent.

Figure 16. Profile of north wall of XU 4 showing correlation between excavator-identified "Zones" and geoarchaeological "Strata" (figure and descriptions provided by Charles Frederick).
Charles Frederick).

Significance Testing Investigations: Hand Excavation Units

Four 1 x 1 m hand excavation units (XUs 1-4) were excavated during the testing investigations. Three of these were placed adjacent to backhoe trenches to investigate potential features or to provide larger samples of strata and deposits noted in the trench profiles. The units were excavated by 10 cm thick arbitrary levels utilizing a combination of shovel-skimming and hand trowelling. All excavated matrix was screened through ¼" mesh screens, and all artifacts were bagged by level. Fills from identified features were excavated and screened separately. A datum for each unit was established near the ground surface and depths below datum were recorded for each excavation level. Each unit was excavated to a maximum depth ranging from 90 to 150 cmbs, depending on the depth of artifact-bearing deposits and/or the instability of the sandy sediments. Level forms were filled out for each level in each subunit, and included data on metrics, sediments, features, and artifacts. The stratigraphy in the units was recorded as part of the geoarcheological study and is summarized in its initial interpretation in Figure 16.

XU 1

This was a 1 x 1 m unit placed at the south end of BHT 1 (Figure 3). A total of eleven levels were excavated, reaching a maximum depth of 110 cmbs. No features were identified. A total of 19 artifacts were recovered from Levels 3-10 (20-100 cmbs; Table 6, Figure 17). The recovered material consisted entirely of lithic debitage (18 chert, 1 silicified wood).

Table 6. Artifacts recovered from XU 1, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
3	20-30	Lithic debitage	chert	4	
			silicified wood	1	
4	30-40	Lithic debitage	chert	2	
5	40-50	Lithic debitage	chert	2	
6	50-60	Lithic debitage	chert	2	
7	60-70	Lithic debitage	chert	2	
8	70-80	Lithic debitage	chert	3	
9	80-90	Lithic debitage	chert	1	
10	90-100	Lithic debitage	chert	2	
			Total	19	

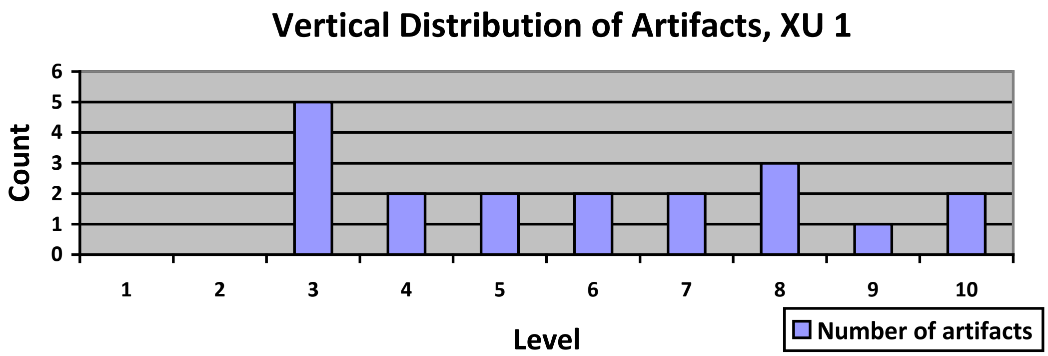


Figure 17. Vertical distribution of artifacts recovered from XU 1, 41HR1114.

XU 2

Excavation Unit 2 was located on the east side of BHT 1, at the junction of the main north-south trench and a short east-west perpendicular trench extension (Figure 3). The unit was placed there to investigate what appeared to be a burned feature visible in the trench wall profile.

A total of 12 levels were excavated to a maximum depth of 120 cmbs. The uppermost 40-60 cm consisted of disturbed sediments containing modern materials (brick, glass, metal, plastic) as well as several pieces of lithic debitage. The hand excavation revealed the possible burned feature to be the remains of a burned-out root, rather than a cultural feature. No other features were identified during the excavations.

A total of 32 prehistoric artifacts were recovered from Levels 2-4 and 8-12 (10-40, 70-120 cmbs; Table 7). The artifacts consisted entirely of lithic debitage (30 chert, 2 silicified wood). The vertical distribution of the artifacts suggests two distinct deposits (Figure 18), with just over half the artifacts (53%, n=17) recovered from Levels 2-4 (10-40 cmbs) and 15 from Levels 8-12 (70-120 cmbs).

Table 7. Artifacts recovered from XU 2, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
2	10-20	Lithic debitage	chert	5	
3	20-30	Lithic debitage	chert	7	
4	30-40	Lithic debitage	chert	5	
8	70-80	Lithic debitage	chert	7	
9	80-90	Lithic debitage	chert	3	
10	90-100	Lithic debitage	chert	1	
11	100-110	Lithic debitage	chert	2	
12	110-120	Lithic debitage	silicified wood	1	
			Total	31	

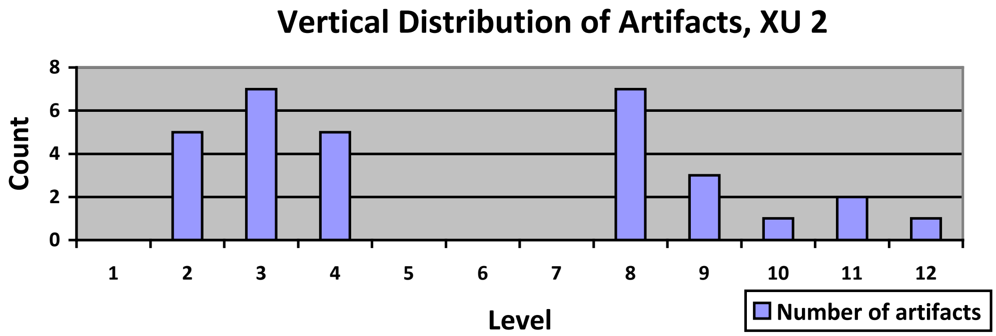


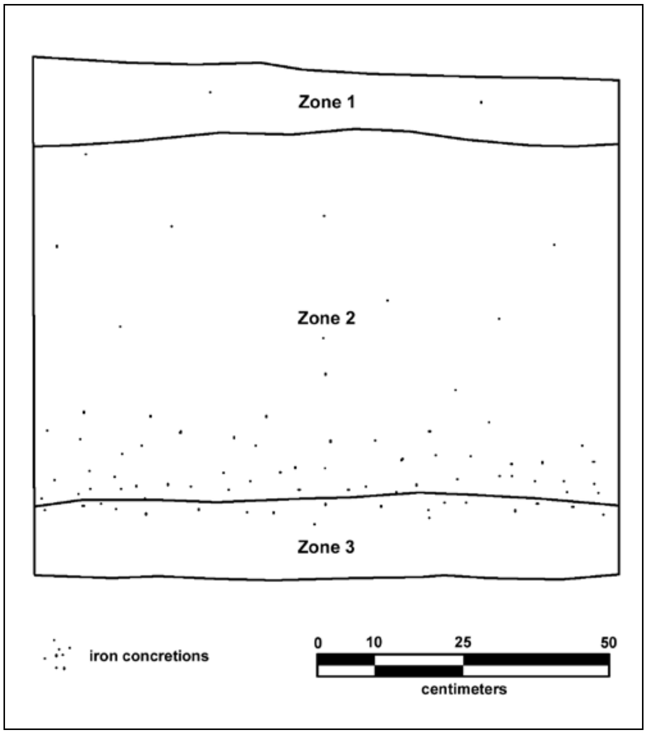
Figure 18. Vertical distribution of artifacts recovered from XU 2, 41HR1114.

XU 3

This unit was placed close to the northern limit of the APE corridor, near the location of ST 54 (Figure 3). This shovel test had produced one of the highest artifact counts (n=22) during site delineation, as well as the only diagnostic lithic artifact, a *Kent* dart point, recovered from shovel tests.

A total of nine levels were excavated to a maximum depth of 90 cmbs. Due to its distance from the geoarcheological trenches, the unit's south wall was recorded (Figure 19). The unit profile consisted of three zones. Zone 1 was the uppermost 10-20 cm layer of dark grayish brown sandy loam (corresponds to Strata 5 and 6). This was underlain by a 65-70 cm thick Zone 2 of pale brown sand (Strata 4 and 5). The underlying grayish brown clay Zone 3 was encountered near the base of Level 8 (from 75-80 cmbs), and excavation was discontinued at the base of Level 9 (90 cmbs). This zone corresponds to Stratum 3. No features were identified during the excavations.

A total of 396 artifacts were recovered from Levels 1-9 (0-90 cmbs; Table 8). The artifacts included two identifiable dart points (silicified wood *Kent* in Level 4, chert *Bulverde* in Level 8), a unidentifiable chert dart point fragment (Level 6), a chert biface, and 391 pieces of lithic debitage (377 chert, 14 silicified wood). The highest densities were recovered from Levels 4-7 (30-70 cmbs), which produced 68 percent (n=271) of the artifacts (Figure 20). In addition, an unidentifiable dart point fragment was recovered from an unknown depth after a portion of the unit wall collapsed.



Zone	Equivalent Stratum	Description
Zone 1	Strata 5, 6	10YR4/2 dark grayish brown sandy loam. Moist and friable. Few roots and rootlets. Very few iron concretions. Moderately bioturbated and truncated. Clear smooth boundary.
Zone 2	Stratum 4	10YR6/3 pale brown sandy loam with few 10YR7/3 very pale brown & 10YR5/4 yellowish brown mottles. Moist and friable. Few iron concretions that increase in size and density towards base of level. Few rootlets. Moderately bioturbated. Clear smooth boundary.
Zone 3	Stratum 3	10YR5/2 grayish brown clay with 10YR4/4 dark yellowish brown mottles. Moist and firm. Bioturbated. Few iron concretions.

Figure 19. Profile drawing of south wall, XU 3, 41HR1114.

Table 8. Artifacts recovered from XU 3, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-10	Lithic debitage	chert	8	
			silicified wood	1	
2	10-20	Lithic debitage	chert	32	
3	20-30	Lithic debitage	chert	33	
			silicified wood	7	
4	30-40	Dart Point	silicified wood	1	*Kent*
		Lithic debitage	chert	50	
			silicified wood	2	
5	40-50	Lithic debitage	chert	67	
			silicified wood	1	
6	50-60	Dart Point Frag.	chert	1	
		Lithic debitage	chert	97	
			silicified wood	2	
7	60-70	Lithic debitage	chert	59	
			silicified wood	2	
		Primary Stage Biface	chert	1	
8	70-80	Dart Point	chert	1	*Bulverde*
		Lithic debitage	chert	33	
			silicified wood	1	
9	80-90	Lithic debitage	chert	4	
slump		Dart Point Frag.	chert	1	
		Lithic debitage	chert	4	
			Total	396	

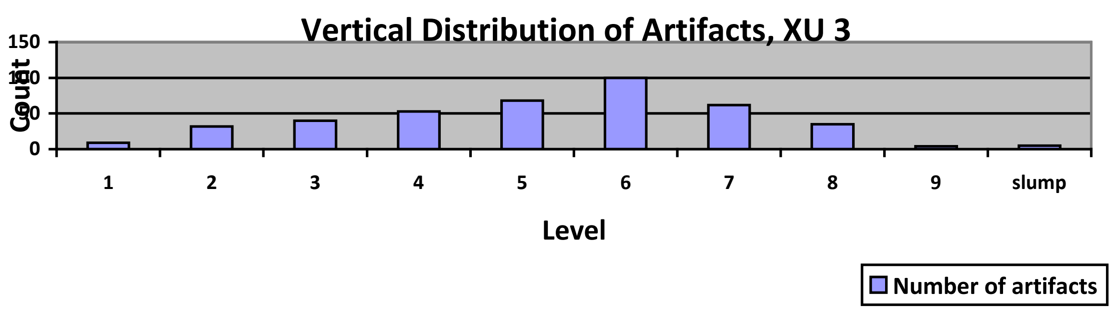


Figure 20. Vertical distribution of artifacts recovered from XU 3, 41HR1114.

XU 4

The final test excavation was placed along the west edge of BHT 2 (Figure 3). The unit was placed there to sample the sediments reveled by the trench wall profile. A total of 15 levels were excavated to a maximum depth of 150 cmbs. No features were identified.

A total of 359 artifacts were recovered from Levels 1-12 (0-120 cmbs; Table 9). The artifacts consisted almost entirely of lithic debitage (318 chert, 44 silicified wood), plus one silicified wood biface from Level 6 (50-60 cmbs). The highest artifact density (41%, n=150) occurred in Levels 6-7 (50-70 cmbs; Figure 21).

Table 9. Artifacts recovered from XU 4, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-10	Lithic debitage	chert	11	
2	10-20	Lithic debitage	chert	14	
3	20-30	Lithic debitage	chert	31	
			silicified wood	3	
4	30-40	Lithic debitage	chert	35	
			silicified wood	7	
5	40-50	Lithic debitage	chert	23	
			silicified wood	2	
6	50-60	Initial Stage Biface	silicified wood	1	
		Lithic debitage	chert	78	
			silicified wood	12	
7	60-70	Lithic debitage	chert	50	
			silicified wood	9	
8	70-80	Lithic debitage	chert	17	
			silicified wood	3	
9	80-90	Lithic debitage	chert	23	
			silicified wood	4	
10	90-100	Lithic debitage	chert	24	
			silicified wood	4	
11	100-110	Lithic debitage	chert	6	
12	110-120	Lithic debitage	chert	1	
			Total	359	

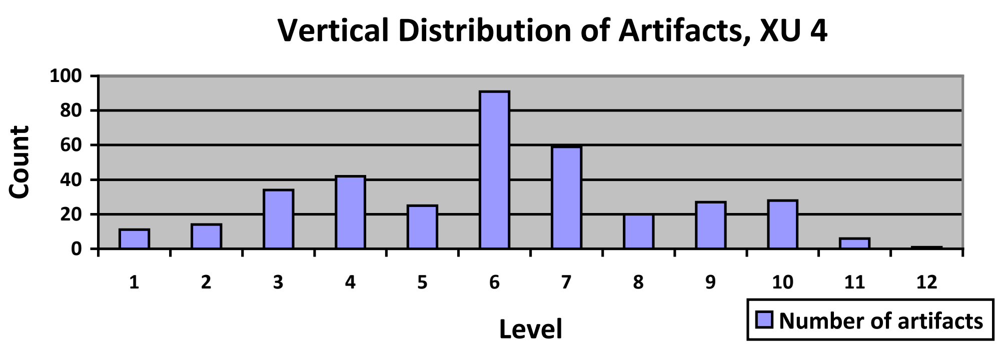


Figure 21. Vertical distribution of artifacts recovered from XU 4, 41HR1114.

Summary of Significance Testing Investigations

During the testing phase, excavations consisted of a total of 35 m of mechanical trenching, and four 1 x 1 m hand excavation units. The hand units produced a total of 815 artifacts, including five dart points and fragments, two bifaces, and 800 pieces of lithic debitage, from Levels 1-13 (0-130 cmbs). The initial geoarcheological investigations suggested that the culture-bearing deposits were contained within intact, sandy alluvial Holocene sediments that sit atop pre-Holocene Lissie Formation sediments. Overlying the cultural deposits is a thin alluvial drape that most likely dates to the recent Historic period.

The results of the testing investigations indicated that the site would be eligible for inclusion in the National Register of Historic Places, and that further archeological work was warranted prior to any construction impacts.

Data Recovery Investigations: Backhoe Trench

A single additional backhoe trench (BHT 3) was excavated during the data recovery investigations. The trench was oriented east-west and measured 10 m in length and 2 m in depth. The trench stretched from the west edge of XU 5 and crossed the southern end of BHT 2. This final trench provided the majority of samples taken for the final archaeometric studies (i.e., OSL, particle size, LOI, etc.) conducted at the site (see Chapter 3).

Data Recovery Investigations: Hand Excavation Units

Data recovery investigations began with the excavation of two large, 2 x 3 m block excavations. The first block excavation was placed in an area of minimal surface disturbance, approximately 5 m southeast of XU 4. The unit was oriented north-south, and to ensure optimal horizontal control, was divided into six 1 x 1 m units XUs 5-10 (Figure 3). The second block unit was placed near the most productive test unit, XU 3. This unit was also oriented north-south, and divided into six 1 x 1 units, XUs 11-16 (Figure 3). The arrangement of the 1 x 1 m subunits was as illustrated below (north is up During excavation, each 1 x 1 m unit was excavated, screened, and recorded individually, but the sequence of excavation was ordered so that each level was excavated across the entire block before the next lower level was begun. Due to the unevenness of the ground surface, and the degree of disturbance in the uppermost strata that had been documented during testing, Level 1 for XUs 5-16 extended from 0-20 cmbs, while all remaining levels were excavated as 10 cm thick layers.

5	6
7	8
9	10

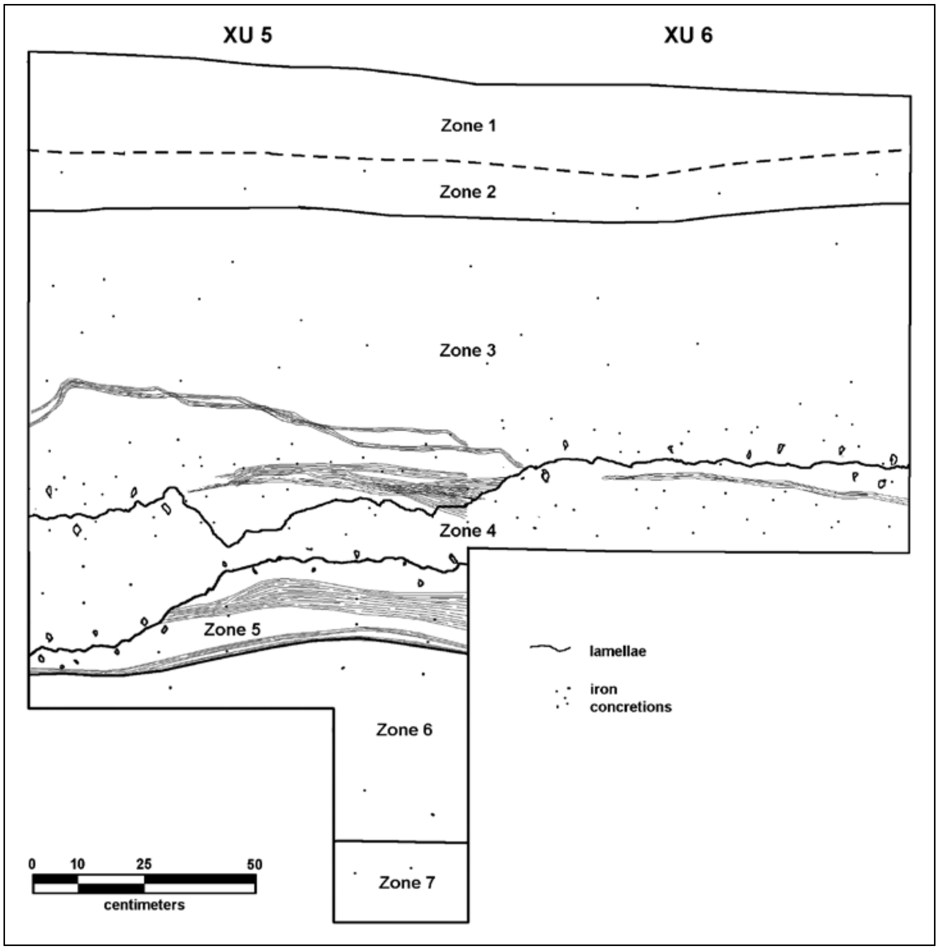
11	12
13	14
15	16

Block 1: XUs 5-10

This unit was placed close to the northern limit of the APE corridor, near the location of ST 54. This shovel test had produced one of the highest artifact counts (n=22) during site delineation, as well as the only diagnostic lithic artifact, a *Kent* dart point, recovered from shovel tests.

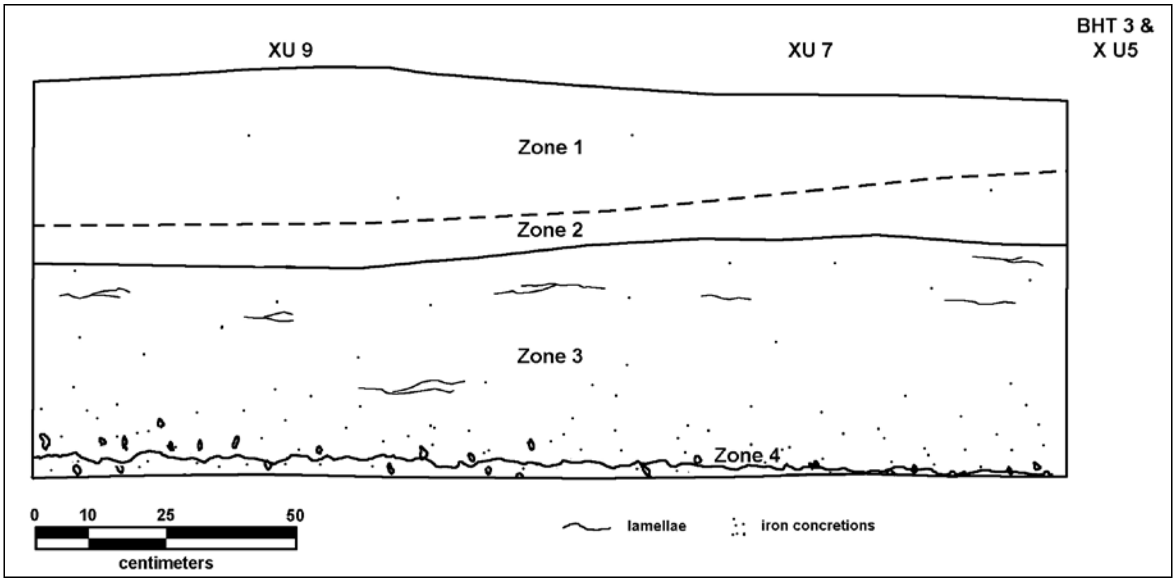
A total of seven levels were excavated to a maximum depth of 80 cmbs across the entire block (Figures 22-30). However, in order to sample deeper sediments, excavation was continued in the two northern units, XUs 5 and 6. XU 5 was excavated to a total depth of 150 cmbs (Level 14), while XU 6 was taken down to a maximum depth of 110 cmbs (Level 10). The uppermost 15-25 cm consisted of a plow zone of sandy loam. This was underlain by a 10-15 cm thick zone of sandy loam followed by a 45 cm thick layer of sandy loam. A series of alternating sandy clay and clayey sand layers extended to below the limits of the excavation at a depth of 150 cmbs (XU 5). While no cultural features were identified, significant bioturbation was indicated by the presence of several large krotovina within the upper 3 zones.

A total of 1962 artifacts were recovered from Levels 1-11 (0-120 cmbs; Tables 10-15). The artifacts included five identifiable dart points (three *Kent*, one *Palmillas*, one *Godley*), two unidentifiable dart point fragments, eight bifaces, one chert core, two utilized flakes, 1888 pieces of lithic debitage (1713 chert, 3 quartzite, 56 silicified wood), 36 Goose Creek plain sherds, six pieces of burned clay, and one fragment of ochre mineral. The highest densities were recovered from Levels 3-6 (30-70 cmbs), which produced 87 percent (n=1583) of the artifacts (Figure 24). In terms of chronologically diagnostic artifacts, Ceramic period pottery, which is found in southeast Texas after AD 800, was encountered throughout all the high density levels, and was found in the same levels as dart points that have been dated to the Middle and Late Archaic (5000-1000 BC, 1000 BC-AD 800).



Zone	Equivalent Stratum	Description
Zone 1	Stratum 6	10YR6/2 light brownish gray sandy loam. Dry and hard. Bioturbated and disturbed from agriculture. Few roots and rootlets. Clear wavy boundary.
Zone 2	Stratum 5	10YR5/2 grayish brown sandy loam. Moist and friable. Few roots and rootlets. Very few iron concretions. Moderate bioturbation and truncation but otherwise intact. Clear smooth boundary.
Zone 3	Stratum 4	Mottled 10YR7/2 light gray and 10YR6/2 light brownish gray fine sandy loam. Dry and soft. Few rootlets. Few iron concretions that increase in size and density towards the base of the level. Few lamellae at base of level. Somewhat bioturbated. Clear irregular boundary.
Zone 4	Stratum 3	10YR5/2 grayish brown sandy clay. Moist and firm. Few iron concretions. Few prismatic structures. Clear irregular boundary.
Zone 5	Stratum 2	Mottled 10YR7/2 light gray and 10YR6/2 light brownish gray fine sand. Dry and soft. Few iron concretions. Few lamellae throughout. Somewhat bioturbated. Clear wavy boundary.
Zone 6	Stratum 1	Mottled 10YR6/3 pale brown and 10YR4/2 dark grayish brown sandy clay. Few orange mottles. Very few iron concretions. Clear smooth boundary.
Zone 7	Stratum 1?	Mottled 10YR7/2 light gray and 10YR4/2 dark grayish brown sandy clay. Few orange mottles. Very few iron concretions.

Figure 22. Profile drawing of north wall, XUs 5 and 6, 41HR1114.



Zone	Equivalent Stratum	Description
Zone 1	Stratum 6	10YR6/2 light brownish gray sandy clay. Dry and hard. Bioturbated and disturbed from agriculture. Few roots and rootlets. Very few iron concretions. Clear smooth boundary.
Zone 2	Stratum 5	10YR4/2 dark grayish brown sandy clay loam. Moist and friable. Few roots and rootlets. Very few iron concretions. Moderate bioturbation and truncation but otherwise intact. Clear smooth boundary.
Zone 3	Stratum 4	Mottled 10YR7/2 light gray and 10YR6/2 light brownish gray fine sandy loam. Moist and friable. Few iron concretions that increase in size and density towards the base of the level. Few lamellae throughout. Somewhat bioturbated. Clear irregular boundary.
Zone 4	Stratum 3	10YR5/2 grayish brown sandy clay. Moist and firm. Few iron concretions. Few prismatic structures.

Figure 23. Profile drawing of west wall, XUs 7 and 9, 41HR1114.

Table 10. Artifacts recovered from XU 5, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Iron-nail	Iron	1	modern
		Lithic debitage	chert	16	
2	20-30	Brick	Brick	1	modern
		Ammunition	Ammunition	1	modern
		Lithic debitage	chert	6	
3	30-40	Misc Burned Clay	clay	1	
		Lithic debitage	chert	51	
4	40-50	Lithic debitage	chert	75	
			silicified wood	5	
5	50-60	Lithic debitage	chert	77	
			silicified wood	7	
6	60-70	Initial stage biface	chert	1	Tool #9
		Lithic debitage	chert	45	
7	70-80	Ochre	Ochre	1	
		Lithic debitage	chert	34	
			silicified wood	2	
8	80-90	Lithic debitage	chert	15	
			silicified wood	1	
9	90-100	Lithic debitage	chert	4	
10	100-110	Lithic debitage	chert	1	
11	110-120	Lithic debitage	chert	3	
12	120-130 59	Native American pottery	ceramic	1	Goose Creek Plain
			Total	349	

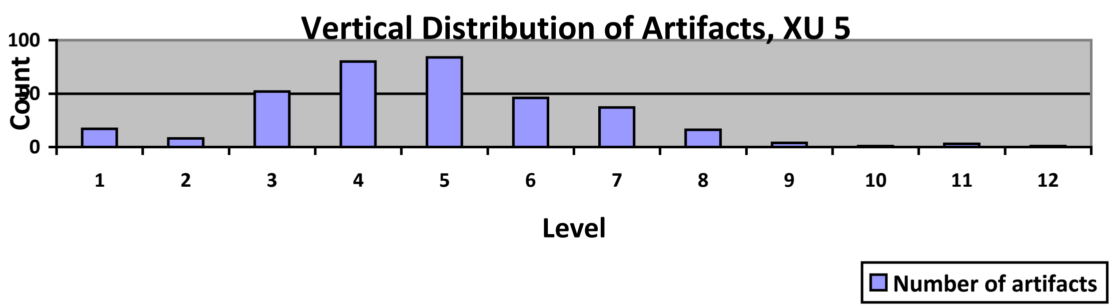


Figure 24. Vertical distribution of artifacts recovered from XU 5, 41HR1114.

Table 11. Artifacts recovered from XU 6, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Curved glass	glass	2	Modern, clear
1	0-20	Lithic debitage	chert	7	
2	20-30	Historic ceramic	Modern ceramic	1	Brown glaze, rim sherd
2	20-30	Curved glass	glass	1	
2	20-30	Lithic debitage	chert	2	
3	30-40	Lithic debitage	chert	48	
			silicified wood	2	
4	40-50	Dart Point Frag.	chert	1	Tool #10
		Lithic debitage	chert	124	
			silicified wood	3	
		Native American Pottery	ceramic	11	Goose Creek Plain
5	50-60	Lithic debitage	chert	77	
			silicified wood	1	
		Misc Burned Clay	clay	3	
		Native American Pottery	ceramic	2	Goose Creek Plain
6	60-70	Dart Preform fragment	chert	1	Tool #11
		Lithic debitage	chert	40	
		Lithic debitage	silicified wood	1	
		Native American Pottery	ceramic	3	Goose Creek Plain
		Primary Stage Biface	silicified wood	1	Tool #12
7	70-80	Lithic debitage	chert	23	
		Misc Burned Clay	clay	1	
		Native American Pottery	ceramic	2	Goose Creek Plain
9	90-100	Lithic debitage	chert	1	
			Total	355	

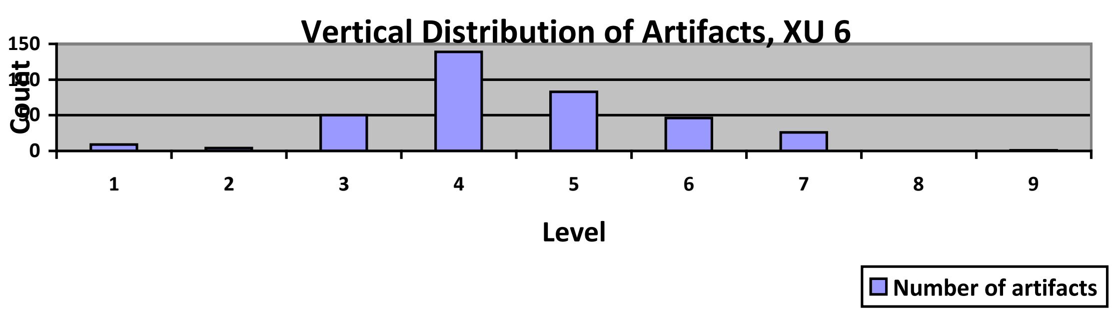


Figure 25. Vertical distribution of artifacts recovered from XU 6, 41HR1114.

Table 12. Artifacts recovered from XU 7, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Synthetic	plastic	1	Orange tape, modern
1	0-20	Lithic debitage	chert	19	
2	20-30	Lithic debitage	chert	26	
3	30-40	Lithic debitage	chert	52	
		Native American Pottery	ceramic	3	Goose Creek Plain
4	40-50	Lithic debitage	chert	72	
			silicified wood	2	
5	50-60	Misc Burned Clay	clay	1	
		Dart Preform/Frag.	chert	1	Tool #13
		Lithic debitage	chert	45	
			silicified wood	5	
6	60-70	Dart Point Frag.	chert	1	Tool #14
		Lithic debitage	chert	50	
			silicified wood	1	
7	70-80	Lithic debitage	chert	3	
			Total	282	

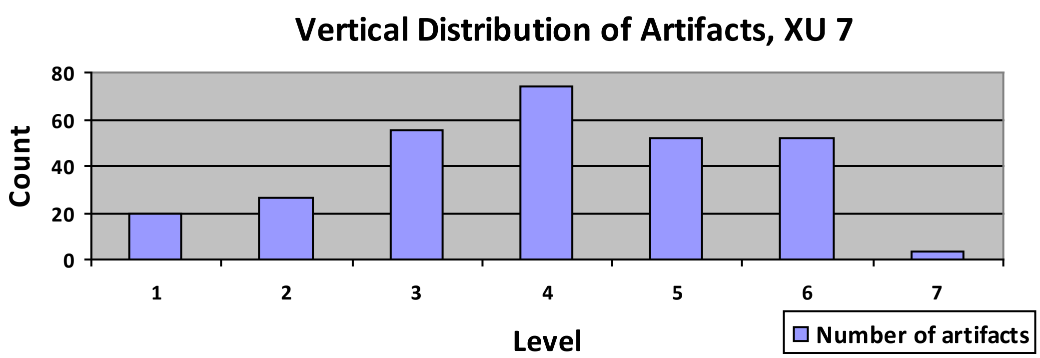


Figure 26. Vertical distribution of artifacts recovered from XU 7, 41HR1114.

Table 13. Artifacts recovered from XU 8, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	11	
2	20-30	Lithic debitage	chert	20	
3	30-40	Lithic debitage	chert	116	
			silicified wood	2	
		Native American Pottery	ceramic	4	Possibly red slip on 3 fragments
4	40-50	Lithic debitage	chert	75	
			silicified wood	3	
5	50-60	Dart Point	chert	1	
		Lithic debitage	chert	67	
			quartzite	1	
		Native American Pottery	ceramic	2	Refit, Goose Creek Plain
6	60-70	Dart Point	chert	1	Tool # 15 *Godley*-like
		Lithic debitage	chert	44	
			silicified wood	1	
7	70-80	Lithic debitage	chert	3	
			Total	351	

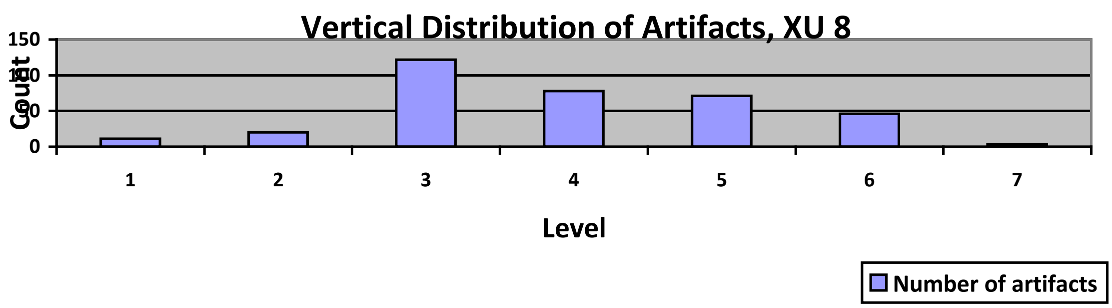


Figure 27. Vertical distribution of artifacts recovered from XU 8, 41HR1114.

Table 14. Artifacts recovered from XU 9, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Synthetic	plastic	1	Orange tape, modern
		Lithic debitage	chert	14	
2	20-30	Iron-nail	iron	1	Round, modern
		Lithic debitage	chert	7	
3	30-40	Utilized flake	chert	1	
		Lithic debitage	chert	61	
			silicified wood	2	
4	40-50	Lithic debitage	chert	66	
			quartzite	1	
			silicified wood	10	
		Native American Pottery	ceramic	1	Goose Creek Plain, weathered
5	50-60	Core	chert	1	Tool #16
		Lithic debitage	chert	66	
			silicified wood	4	
		Native American Pottery	ceramic	1	Goose Creek Plain, weathered
		Secondary Stage Biface	chert	1	Tool #17
6	60-70	Lithic debitage	chert	20	
			quartzite	1	
			silicified wood	3	
7	70-80	Lithic debitage	chert	2	
			Total	264	

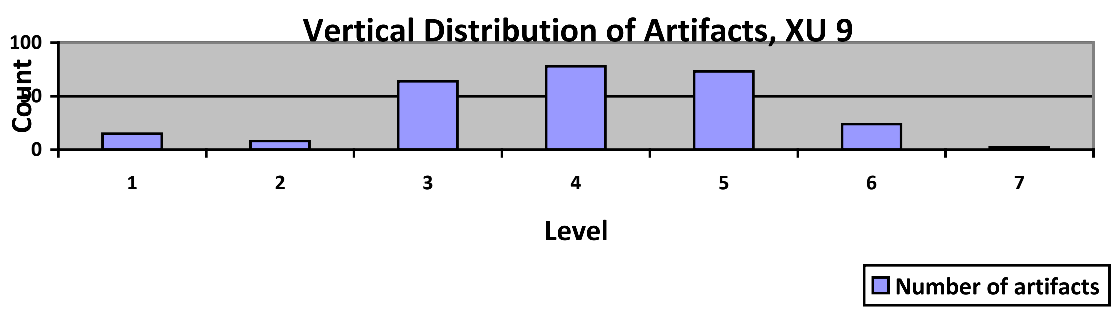


Figure 28. Vertical distribution of artifacts recovered from XU 9, 41HR1114.

Table 15. Artifacts recovered from XU 10, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	6	
2	20-30	Lithic debitage	chert	5	
3	30-40	Lithic debitage	chert	49	
		Native American Ceramic	ceramic	1	Goose Creek Plain
4	40-50	Lithic debitage	silicified wood	1	
		Lithic debitage	chert	80	
		Native American Pottery	ceramic	1	Goose Creek Plain
5	50-60	Dart Point	silicified wood	1	Tool #19 *Palmillas*
		Lithic debitage	chert	89	
			silicified wood	5	
		Native American Pottery	ceramic	3	Goose Creek Plain
		Utilized Flake	chert	1	Tool #18
6	60-70	Dart Point, proximal frag.	silicified wood	1	Tool #21 *Kent*
		Dart Preform/Frag.	chert	1	Tool #20
		Lithic debitage	chert	48	
		Secondary Stage Biface	chert	1	Tool #62
7	70-80	Dart Point	silicified wood	1	Tool #22 *Kent*
		Lithic debitage	chert	11	
			Total	304	

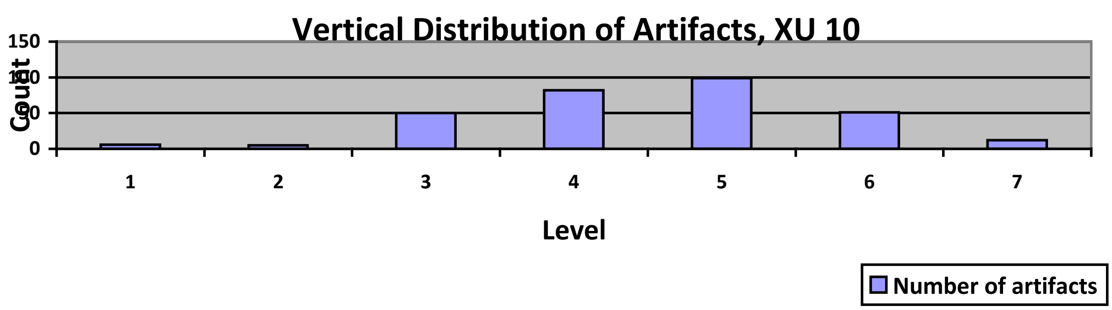


Figure 29. Vertical distribution of artifacts recovered from XU 10, 41HR1114.

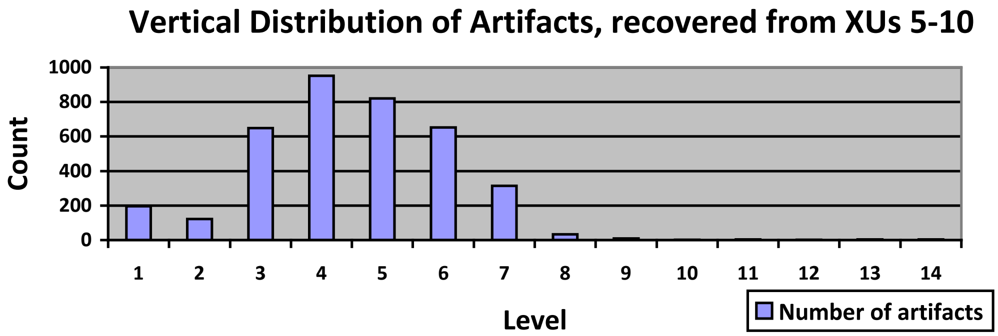
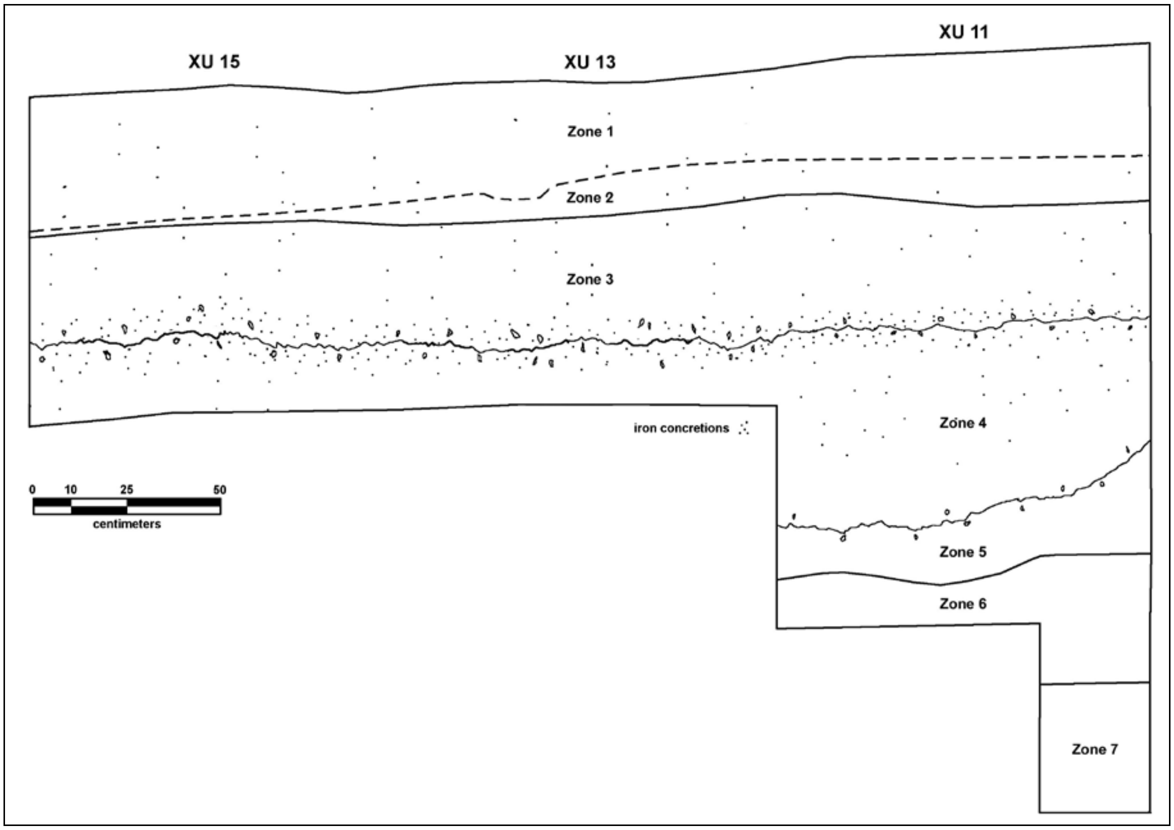


Figure 30. Vertical distribution of artifacts recovered from XUs 5-10, 41HR1114.

Block 2: XUs 11-16

This unit was placed near the site's center, approximately 5 m east of XU 4. A total of eight levels were excavated to a maximum depth of 90 cmbs across the entire block (Figures 31-38). However, in order to sample deeper sediments, excavation was continued down to 160 cmbs (Level 15) in XU 11, the 1 x 1 unit in the northwest corner of the block. An additional 40 cm deep shovel probe was then excavated in the unit corner to reach a final maximum depth of 200 cmbs. The revealed stratigraphy was similar to that of the first block excavation, with an upper 20-35 cm plow zone of sandy loam followed by a 2-15 cm thick zone of sandy loam, a 35 cm thick layer of sandy loam, and a series of alternating sandy clay and clayey sand layers that extended to below the limits of the excavation. No cultural features were identified.

A total of 1901 artifacts were recovered from Levels 1-14 (0-150 cmbs; Tables 16-21). The artifacts included 16 identifiable dart points (one *Bulverde*, two *Ellis*, one *Ensor*, five *Gary*, six *Kent*, one *Yarbrough*), 9 unidentifiable dart point fragments, one retouched flake/arrow point, seven bifaces, one chert cobble/chopper, six utilized flakes, 1808 pieces of lithic debitage (1719 chert, 7 quartzite, 82 silicified wood), 22 Goose Creek plain sherds, and 15 unidentifiable faunal bone fragments (some appear to be from medium-sized mammals). The highest densities were recovered from Levels 3-7 (30-80 cmbs), which produced 90 percent (n=1611) of the artifacts (Figure 26). Like the XU 5-10 block, pottery was encountered throughout all the high density levels, and was found in the same levels as dart points that have been dated to the Middle and Late Archaic (5000-1000 BC, 1000 BC-AD 800). Further, the points appeared to be distributed randomly, with early types sometimes encountered above later types, or in the same levels.



Zone	Equivalent Stratum	Description
Zone 1	Stratum 6	Mixed areas of 10YR7/3 very pale brown, 10YR5/3 brown, and 10YR6/2 light brownish gray sand, sandy loam, and sandy clay loam. Moist and firm to moist and friable. Very few iron concretions. Disturbed via agriculture. Bioturbated. Abrupt smooth boundary.
Zone 2	Stratum 5	10YR5/4 yellowish brown sandy loam. Moist and friable. Very few iron concretions. Truncated. Bioturbated. Remnant of intact upper soils beneath agricultural disturbance. Clear smooth boundary.
Zone 3	Stratum 4	10YR7/3 very pale brown fine sandy loam. Moist and friable. Very few iron concretions that increase towards the base of zone. Bioturbated. Abrupt irregular boundary.
Zone 4	Stratum 3	10YR5/2 grayish brown sandy clay. Moist and firm. Few iron concretions. Abrupt irregular boundary.
Zone 5	Stratum 2	10YR6/3 pale brown sand with 10YR5/3 brown mottles. Moist and friable. Abrupt wavy boundary.
Zone 6	Stratum 1	10YR5/3 brown clayey sand. Moist and firm. Clear smooth boundary.
Zone 7	Stratum 1?	10YR6/3 pale brown sandy clay with few 10YR7/8 yellow mottles. Moist and firm.

Figure 31. Profile drawing of west wall, XUs 11, 13, and 15, 41HR1114.

Table 16. Artifacts recovered from XU 11, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	22	
			silicified wood	2	
2	20-30	Lithic debitage	chert	6	
		Non-Human Bone Unmodified	bone	7	fragments, medium-size mammal
		Utilized Flake	chert	1	Tool #23
		Charcoal	charcoal	1	
3	30-40	Lithic debitage	chert	37	
			silicified wood	2	
4	40-50	Dart Point	chert	1	Tool #25 *Kent*
		Dart Preform/Frag.	chert	1	Tool #24
		Lithic debitage	chert	66	
			silicified wood	1	
		Native American Pottery	ceramic	3	Goose Creek Plain
5	50-60	Dart Point	chert	1	Tool #27 *Ensor*
		Dart Point Frag.	chert	1	Tool #26
		Lithic debitage	chert	67	
			silicified wood	4	
		Native American Pottery	ceramic	4	
6	60-70	Biface fragment-secondary stage	chert	1	Tool #29
		Dart point	chert	1	Tool #32, *Kent*
		Dart point	chert	1	Tool #33, *Kent*
		Dart point	chert	1	Tool #30, untyped
		Dart point	chert	1	Tool #31, *Ellis*-like
		Dart Point Frag.	chert	1	Tool #28
		Lithic debitage	chert	77	
			silicified wood	7	
7	70-80	Dart Point	chert	1	Tool #34 *Ellis*-like
		Dart Point	chert	1	Tool # 36 *Kent*
		Dart Point Frag.	chert	1	Tool #35
		Lithic debitage	chert	31	
8	80-90	Lithic debitage	chert	2	
9	90-100	Lithic debitage	chert	4	
11	110-120	Lithic debitage	chert	1	
13	130-140	Lithic debitage	chert	2	
		Native American Pottery	ceramic	1	Goose Creek Plain
14	140-150	Lithic debitage	chert	3	
Wall cleanup		Lithic debitage	chert	7	
			Total	371	

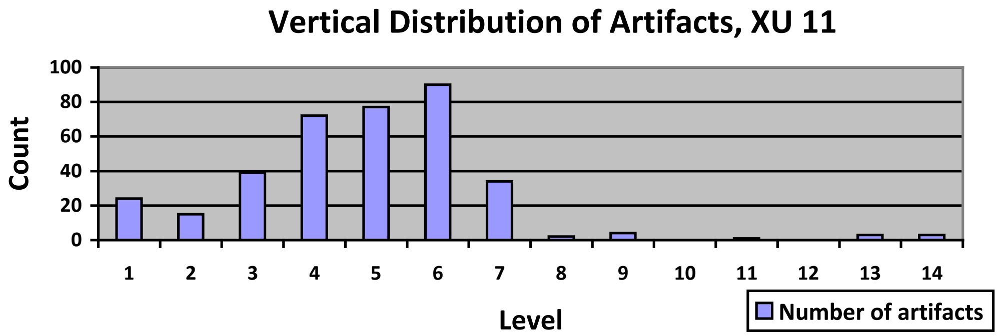


Figure 32. Vertical distribution of artifacts recovered from XU 11, 41HR1114.

Table 17. Artifacts recovered from XU 12, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	26	
2	20-30	Lithic debitage	chert	8	
		Non-Human Bone Unmodified	bone	1	fragment, medium-size mammal
3	30-40	Lithic debitage	chert	53	
			silicified wood	1	
		Native American Pottery	ceramic	1	Goose Creek Plain
4	40-50	Dart Point Frag.	chert	1	Tool #37
		Lithic debitage	chert	67	
			silicified wood	6	
5	50-60	Dart Point	chert	4	Tools #38-41 *Gary*
		Lithic debitage	chert	49	
			silicified wood	6	
6	60-70	Lithic debitage	chert	51	
			silicified wood	3	
		Native American Pottery	ceramic	3	Goose Creek Plain
7	70-80	Lithic debitage	chert	20	
8	80-90	Lithic debitage	chert	2	
		Native American Pottery	ceramic	2	Goose Creek Plain
			Total	304	

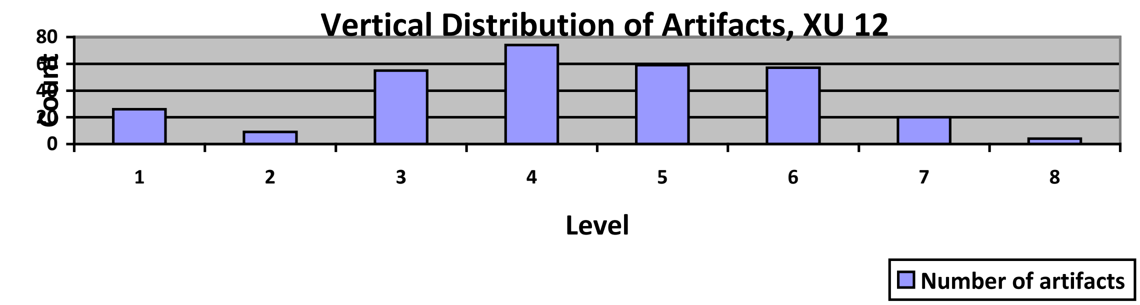


Figure 33. Vertical distribution of artifacts recovered from XU 12, 41HR1114.

Table 18. Artifacts recovered from XU 13, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	17	
		Non-Human Bone Unmodified	bone	4	fragments, medium-size mammal
2	20-30	Brick fragments	brick	3	
		Lithic debitage	chert	10	
			quartzite	1	
			silicified wood	1	
		Non-Human Bone Unmodified	bone	1	fragment
3	30-40	Dart Point Frag.	chert	1	Ind., Tool #42
		Lithic debitage	chert	38	
			silicified wood	1	
		Non-Human Bone Unmodified	bone	2	fragments, medium-size mammal
4	40-50	Lithic debitage	chert	61	
			silicified wood	1	
		Native American Pottery	ceramic	1	Goose Creek Plain
5	50-60	Lithic debitage	chert	55	
			silicified wood	1	
6	60-70	Dart Point	chert	1	Tool #44 *Gary*
		Dart Point Frag.	chert	1	Ind. Tool #43
		Initial Stage Biface	chert	1	Tool #46
		Lithic debitage	chert	81	
			silicified wood	3	
		Non-Human Bone Unmodified	bone	1	fragment
		Utilized Flake	chert	1	Tool #45
		Charcoal	charcoal	3	
7	70-80	Lithic debitage	chert	40	
			silicified wood	2	
			Total	331	

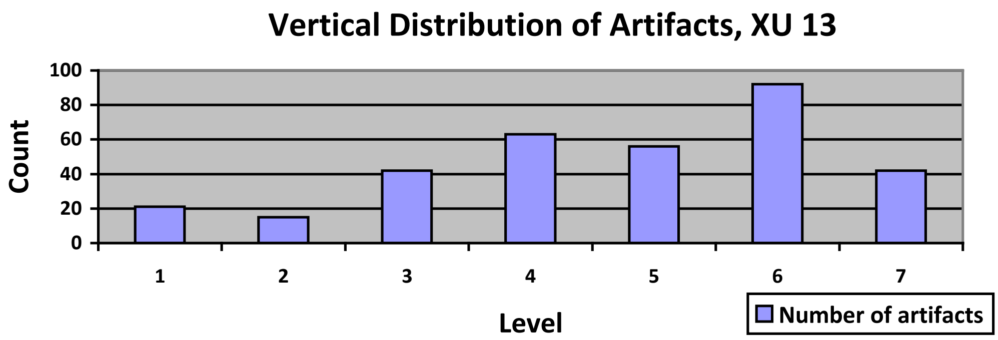


Figure 34. Vertical distribution of artifacts recovered from XU 13, 41HR1114.

Table 19. Artifacts recovered from XU 14, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	12	
			silicified wood	3	
2	20-30	Lithic debitage	chert	5	
3	30-40	Lithic debitage	chert	51	
4	40-50	Dart Point	chert	1	Tool #47 *Kent*
		Lithic debitage	chert	62	
			quartzite	1	
			silicified wood	4	
		Native American Pottery	ceramic	1	Goose Creek Plain
5	50-60	Lithic debitage	chert	42	
			silicified wood	1	
6	60-70	Dart Point	chert	1	Tool #49 *Yarbrough*
		Lithic debitage	chert	42	
			silicified wood	2	
		Retouched Flake	chert	1	Tool #48
7	70-80	Dart Point, untyped	chert	1	Tool #50
		Initial Stage Biface	chert	1	Tool #51
		Lithic debitage	chert	46	
			silicified wood	1	
		Native American Pottery	ceramic	4	Goose Creek Plain
		Utilized Flake	chert	1	Tool #52
8	80-90	Lithic debitage	chert	5	
			Total	288	

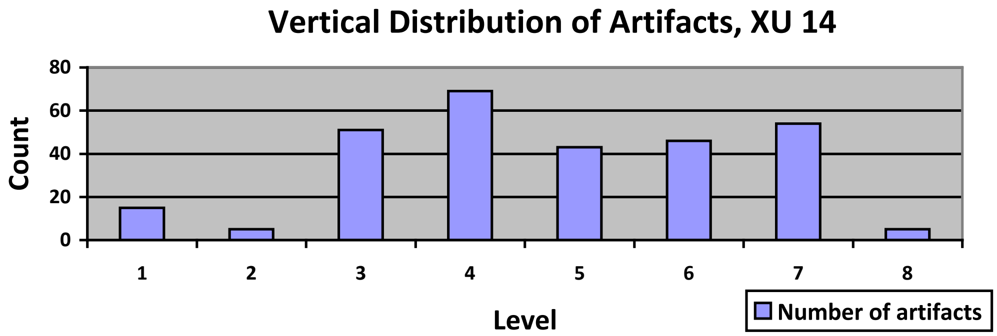


Figure 35. Vertical distribution of artifacts recovered from XU 14, 41HR1114.

Table 20. Artifacts recovered from XU 15, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	18	
2	20-30	Curved glass-amber	glass	1	modern
		Lithic debitage	chert	2	
3	30-40	Lithic debitage	chert	36	
			silicified wood	1	
4	40-50	Lithic debitage	chert	96	
		Native American Pottery	ceramic	1	Goose Creek Plain
5	50-60	Dart Point Frag. untyped	chert	1	Tool #54
		Lithic debitage	chert	65	
			silicified wood	1	
		Primary Stage Biface	chert	1	Tool #53
		Utilized Flake	chert	1	Tool #55
6	60-70	Lithic debitage	chert	63	
			quartzite	1	
			silicified wood	11	
		Projectile point base	chert	1	
		Secondary Stage Biface	chert	1	
		Utilized Flake	chert	2	
7	70-80	Dart Point	chert	1	*Kent*
		Lithic debitage	chert	46	
			silicified wood	6	
8	80-90	Lithic debitage	chert	6	
			Total	352	

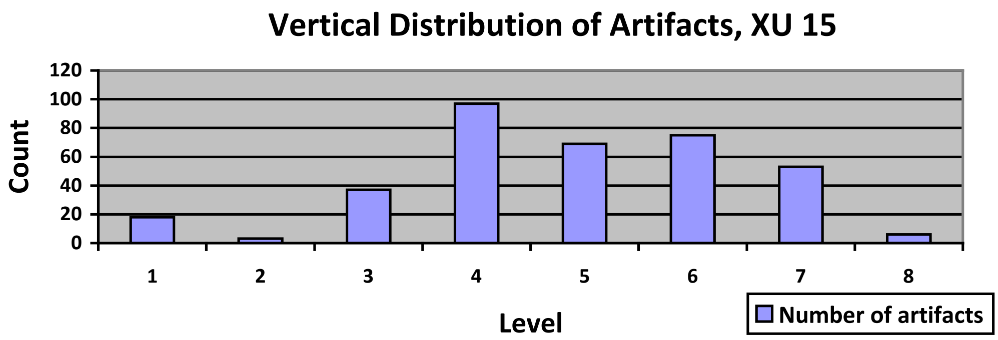


Figure 36. Vertical distribution of artifacts recovered from XU 15, 41HR1114.

Table 21. Artifacts recovered from XU 16, 41HR1114.

Level	Depth (cmbs)	Artifact Class	Material	Count	Comments
1	0-20	Lithic debitage	chert	14	
2	20-30	Lithic debitage	chert	3	
			quartzite	1	
3	30-40	Lithic debitage	chert	29	
			quartzite	2	
			silicified wood	1	
4	40-50	Lithic debitage	chert	49	
5	50-60	Lithic debitage	chert	41	
6	60-70	Dart Point	silicified wood	1	*Bulverde*
		Lithic debitage	chert	26	
			quartzite	1	
7	70-80	Lithic debitage	chert	25	
			silicified wood	1	
		Tested Cobble/Chopper	chert	1	
			Total	195	

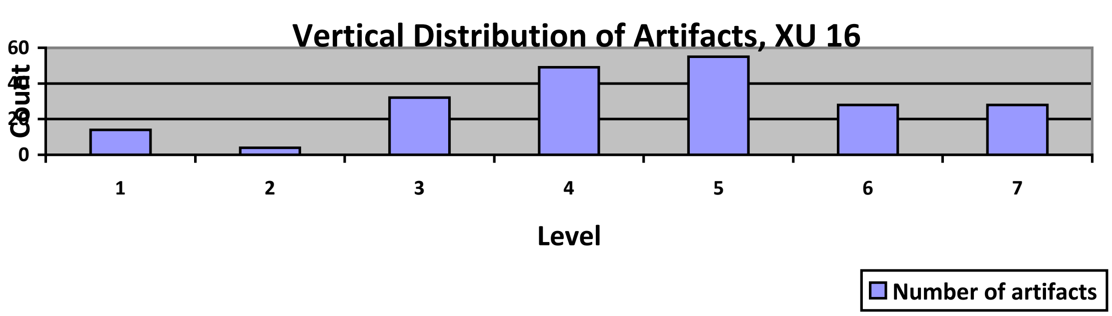


Figure 37. Vertical distribution of artifacts recovered from XU 16, 41HR1114.

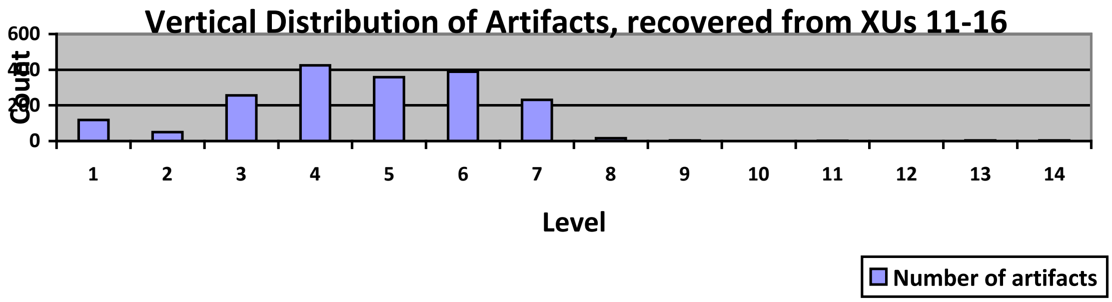


Figure 38. Vertical distribution of artifacts recovered from XUs 11-16, 41HR111.

CHAPTER 7
LITHIC ANALYSIS

H. Blaine Ensor

Introduction

A moderate collection of lithic materials was recovered from site 41HR1114 during Phase I survey, Phase II testing and Phase III mitigation. A total of 62 flaked-stone artifacts (55 formal tools/implements and eight utilized flakes) were recovered from the site during excavations. In addition to these stone artifacts, 4,520 pieces of lithic debitage, 21 pieces of percussion shatter, eight pieces of thermal shatter, and two pieces of natural rock were also recovered. The majority of the artifacts were recovered from hand-excavated units, while the remainder was collected from the shovel test pits and backhoe trenches. The 55 formal flaked stone tools and seven informal flaked stone tools were analyzed and described according to raw material source and type, manufacturing technology, and to a limited extent, use. Formal flaked-stone artifacts recovered include dart points, dart point preforms, initial, primary, and secondary stage bifaces, a core, a tested cobble/chopper, and a utilized flake/arrowpoint. The goals of the analysis were to identify raw material sources and cultural components, understand the lithic technologies employed by site inhabitants, and determine the range of activities that occurred at the site. The methods and techniques used during analysis are described below along with raw material descriptions. Additionally, a detailed description is provided below for each formal lithic tool/implement including relevant discussions of chronology, technology, and use. A lithic summary is provided in the final section which discusses raw material use, lithic technology and stone tool use as well as the distribution of stone tools and debris across the site. Photographs of selected, representative lithic artifacts from each category are presented below. In addition to the summary data presented in this chapter, tabular data for all lithic material by minimal provenience is presented in Appendix IV, with all artifacts listed in Appendix V.

Laboratory Procedures

After washing and drying, lithic material, consisting of flake debris, shatter, fire-cracked rock, natural rock, and flaked and pecked/ground stone implements were carefully sorted. Formal tools such as dart/arrow points, bifaces and biface fragments, core/core fragments, and tested pebbles/cobbles, etc. were separated from flake debris and other lithic material. No pecked/groundstone artifacts were recovered. Flakes that showed clear use-modification such as regular nibbling and scarring along one or more edge margins (utilized flakes) were separated from other flake debris at the same time that formal tools were separated. All formal tools were separated and assigned unique artifact numbers in preparation for detailed analysis. The remaining material was separated into five main categories: flake debris or debitage, utilized flakes, percussion shatter, fire cracked rock/thermal shatter, and natural rock.

Flake Debris/Debitage Analysis

Methodology

Flakes are defined as resulting from intentional removal from an objective piece. In general flakes possess striking platforms, bulbs of percussion, eraillure flake scars on the ventral surface, dorsal flake scars, and regular thin margins (Crabtree 1972). Percussion shatter was defined as angular/blocky debris, amorphous in form, that is the result of core reduction or flaked stone tool manufacture. Shatter possesses none of the attributes commonly associated with flake debris. An angular, blocky appearance and lack of linear symmetry characterize shatter. Smooth surfaces intersect at acute angles, but the overall form is irregular in shape. Heat-treatment/burning may occur (pot lid fractures, discoloration) but no severe crazing or crenated fractures are present as with fire-cracked rock. Fire-cracked rock/thermal shatter is stone, either natural or intentional, that exhibits crenated fractures, irregular, jagged edges, severe crazing/fissures, pot-lid fractures, and discoloration caused by extreme heat. There is an absence of ventral or interior surfaces that might be interpreted as a piece of flaking debris, shatter, or a core.

The debitage method used in this study is primarily an aggregate or mass analysis/flake size analysis approach whereby flake debris is size–graded through a standard set of geologic sieves or measured by some standardized method. Size–grade analysis has been shown to be a good predictor of overall flaked stone reduction stage (cf. Ahler 1975, 1989, Morrow 1984; Patterson 1982, 1990). Despite the ability to accurately identify different stages of tool production during replication experiments, its ability to differentiate mixed lithic assemblages has recently been questioned (Andrefsky 2007). Formal attribute approaches are sometimes coupled with aggregate size–grade analysis (often in conjunction with tool replication studies) to identify general reduction stages within site components (cf. Drollinger 1988; Ensor and White 1998; Morrow 1984). In the current analysis, presence or absence of cortex was used recorded in conjunction with flake size to explore lithic reduction strategies at the site. Both the attribute approach and aggregate analysis have their downsides. In the case of flake attribute analysis, consistent identification of attributes is a problem since this is directly related to experience of the observer.

After Ahler (1975, 1989; Ensor and Gauthier 1987; Ensor and White 1998; Morrow 1984) all flake debris were size-graded through a series of four nested geologic sieves. The four sieve sizes included Size 1, 1 inch (25 mm), Size 2, three-quarters inch (19 mm), Size 3, one-half inch (12.5 mm), and Size 4, one-quarter inch (6.3 mm). Only unmodified flake debris was included here; shatter and fire-cracked rock/thermal shatter were not size-graded. Utilized flakes were also not included, however a separate analysis and count and weight was conducted by provenience. Flakes were hand-manipulated through each sieve to eliminate potential bias. The presence or absence of cortex was noted for each piece of flake debris caught in each size-grade and the number of flakes in each size-grade was counted and weighed for cortical and non-cortical flakes. A count and weight of each raw material category (chert or silicified wood) was made for each size-grade. Counts and weights of heated versus unheated flake debris were also be made by raw material type. Only flakes that exhibited clear evidence of intentional thermal alteration were so classified. Resulting counts and weights for each flake size-grade, utilized flakes, percussion shatter, fire-cracked rock/thermal shatter were entered into an Excel spreadsheet by category and minimal provenience (excavation unit/level/stratum/feature, etc.) to facilitate analysis. Formal tools were set aside in preparation for detailed description and analysis.

Formal Flaked Stone Tool Analysis

Methodology

The manufacture of flaked stone tools is considered a subtractive process in that stone is removed from the original objective piece and cannot be replaced once it is removed (Collins 1975). Many researchers view bifacial reduction as a series of stages that are used to characterize the extent of biface manufacture at a site (Bradley 1975; Callahan 1979; Whittaker 1994), although some prefer to view it as a continuum (Shott 1996; Andrefsky 1998:180). Acquisition of the raw material from either local or non-local sources is the first step in tool manufacture. Determination of whether or not the raw materials used in tool manufacture at a site were procured locally or at a considerable distance is an important factor to be considered when interpreting the nature of the objectives pieces being reduced on-site as well as the type of tool forms that were imported to the site in completed or partially completed form. For purposes of the present analysis, the stage concept is used as a heuristic device to allow discussion of the nature of core and biface reduction at the site. However, inferences regarding core and biface reduction behavior are made using both stone tool/implements and debitage flake debris among others since all data available should be used when interpreting the human behavior and site activities responsible for the stone artifact assemblage recovered at a site (Andrefsky 1998:234).

During this study, cores and initial stage bifaces (general category blank) are defined as not been substantially altered from the original objective piece. The majority of these appear to have been either discarded prior to completion, were unusable, and/or served as flake sources. The majority are generally thick and possess irregular margins and exhibit haphazard percussion flaking. Primary or intermediate stage bifaces exhibit primary flaking and shaping in which the overall form of the objective piece has been substantially modified (Boisvert et al. 1979; Collins 1975). No secondary retouch is evident but margins become more regular and additional thinning has taken place. Secondary stage bifaces include final stage preforms are thought to have passed through the primary flaking stage and represent final stage bifaces (including projectile point/knives) (Collins 1975). These may be hafted or unhafted and finished or unfinished due to breakage and discard. Manufacturing operations likely to have been carried out during this stage include serration, edge straightening or grinding, and hafting. Artifacts that have been substantially modified from their original finished form include specimens that exhibit evidence of rejuvenation or recycling. Recycling is the transformation of one artifact form into another while rejuvenation or maintenance involves replenishing a worn tool (Collins 1975).

Flaked Stone Tool Description and Analysis

All flaked stone artifacts (N=62) were categorized based on overall form and flaking technology. The flaked stone specimens were placed into a series of techno-morphological categories taking into account the technological reduction stages and overall form. The raw material and presence or absence of heat treating was also noted for each stone tool. Lithic categories recognized include dart points and dart point fragments, dart point preforms/fragments, initial, primary, and secondary stage bifaces/fragments, a core, a tested cobble/chopper, a retouched flake/arrow point, and utilized flakes. The artifacts were classified according to the nature of the original blank, such as pebble/cobble or flake as well the placement and extent of flaking. Aspects of morphology and technology were discussed for each category including the presence of absence of cortex, burning, and heat treatment as noted above. Lithic artifacts were measured and weighed to the nearest tenth of a millimeter or gram as completeness allowed. Measurements taken for all tools include: 1) maximum length, 2) maximum width, 3) maximum thickness, and 4) weight. In addition to these measurements, dart points also had shoulder width, juncture width, haft element length, and basal width taken (Tables 22, 23). Artifact illustrations are presented in Figures 27-30.

Individual, detailed, flaked stone descriptions are presented below along with relevant discussions of technology, chronology, and use. Summary attribute data for the lithic categories are presented in Tables 22, 23. These include raw material, reduction/technological state, blank type, tool completeness, presence or absence of cortex and heat treatment, burning, and presence or absence of haft grinding/impact fracture as appropriate. Measurement data are presented under the individual tool descriptions and also summarized in tabular format by stone tool category. Photographs of representative lithic artifacts from the site are also presented.

Table 22. Provenience and Metric Data for Lithic Categories at 41HR1114.

Tool No.	Unit	Level	Depth	Lithic Category	Point Type	Length	Maximum Width	Shoulder Width	Thickness	Juncture Width	Haft Element Length	Basal Width	Weight
1	54	8	80-90 cm	Dart Point	Kent	52.5	22.5	22.3	9.1	14.6	11.0	11.0	9.4
2	3	4	30-40 cm	Dart Point	Kent	33.4	19.8	19.8	7.3	13.2	12.7	9.4	4.1
3	3	6	50-60 cm	Dart Point Frag.	Ind.							11.3	1.0
4	3	7	60-70 cm	Primary Stage BF	N/A								1.0
5	3	8	70-80 cm	Dart Point	Bulverde	50.9	23.6	23.6	4.5	12.7	8.6	11.9	11.5
6	3	slump		Dart Point Frag.	Ind.								3.6
7	Trench 3			Dart Point Frag.	Ind.								7.6
8	4	6	50-60 cm	Initial Stage BF	N/A								38.3
9	5	6	60-70 cm	Initial Stage BF	N/A	37.5	26.2		10.0				10.9
10	6	4	40-50 cm	Dart Point Frag.	Ind.								1.0
11	6	6	60-70 cm	Dart Preform/Frag.	Kent	45.5	25.0	23.1	13.4	13.5	10.6	8.5	11.2
12	6	6	60-70 cm	Primary Stage BF	N/A	53.6	30.0		13.8				17.3
13	7	5	50-60 cm	Dart Preform/Frag.	N/A								2.9
14	7	6	60-70 cm	Dart Point Frag.	Ind.								3.0
15	8	6	60-70 cm	Dart Point	Godley-like	43.6	22.7	20.8	11.1	13.6	13.3	14.6	7.8
16	9	5	50-60 cm	Core	N/A	38.1	28.4		24.1				33.0
17	9	5	50-60 cm	Secondary Stage BF	N/A		26.3		9.2				13.2
18	10	5	50-60 cm	Utilized Flake	N/A								5.0
19	10	5	50-60 cm	Dart Point	Palmillas	42.7	17.1	16.9	6.8	10.2	6.9	9.6	4.6
20	10	6	60-70 cm	Dart Preform/Frag.	N/A	60.7	23.3		18.9				16.3
21	10	6	60-70 cm	Dart Point	Kent		23.0	22.8	7.4	14.4	13.4	5.9	3.6
22	10	7	70-80 cm	Dart Point	Kent	46.0	23.0	23.0	10.6	13.8	14.1	12.3	7.1
23	11	2	20-30 cm	Utilized Flake	N/A								2.9
24	11	4	40-50 cm	Dart Preform/Frag.	N/A								5.7
25	11	4	40-50 cm	Dart Point	Kent	47.3	17.4	17.4	9.6	11.8	10.7	10.5	6.2
26	11	5	50-60 cm	Dart Point Frag.	Ind.								1.5
27	11	5	50-60 cm	Dart Point	Ensor		23.2	23.0	6.0	13.3	10.9	16.8	7.3
28	11	6	60-70 cm	Dart Point Frag.	Ind.								1.5
29	11	6	60-70 cm	Secondary Stage BF	N/A								0.3
30	11	6	60-70 cm	Dart Point	Untyped	32.3	18.0	17.8	6.2	12.4	6.9	11.7	3.0
31	11	6	60-70 cm	Dart Point Frag.	Ellis-like		16.2	16.2	8.4	14.7	12.6	17.0	5.8
32	11	6	60-70 cm	Dart Point	Kent	43.5	24.5	24.5	8.2	14.2	11.5	11.6	7.9

Table 22. Continued.

Tool No.	Unit	Level	Depth	Lithic Category	Point Type	Length	Maximum Width	Shoulder Width	Thickness	Juncture Width	Haft Element Length	Basal Width	Weight
33	11	6	60-70 cm	Dart Point Frag.	Kent		24.0	24.0	9.7	15.6	10.5	11.6	6.4
34	11	7	70-80 cm	Dart Point	Ellis-like		26.3	26.3	9.0	16.3	13.4	18.8	8.7
35	11	7	70-80 cm	Dart Point Frag.	Ind.		-7.0	-2.0	-3.0	-4.0	-5.0	-6.0	1.3
36	11	7	70-80 cm	Dart Point	Kent	40.2	14.7	13.7	6.1	10.6	7.9	9.3	3.8
37	12	4	40-50 cm	Dart Point Frag.	Ind.								2.1
38	12	5	50-60 cm	Dart Point	Gary	44.3	16.6	16.6	6.3	10.0	11.8	5.3	3.3
39	12	5	50-60 cm	Dart Point	Gary		20.2	20.2	5.4	13.0			2.9
40	12	5	50-60 cm	Dart Point	Gary	35.7	19.5	19.5	6.8	10.7	7.9	4.4	3.0
41	12	5	50-60 cm	Dart Point	Gary	33.6	14.9	14.9	5.9	10.1	6.7	6.2	2.6
42	13	3	30-40 cm	Dart Point Frag.	Ind.								0.6
43	13	6	30-40 cm	Dart Point Frag.	Ind.								1.3
44	13	6	60-70 cm	Dart Point	Gary	48.8	16.7	16.3	8.0	12.3	13.6	6.1	5.5
45	13	6	60-70 cm	Utilized Flake	N/A								0.9
46	13	6	60-70 cm	Initial Stage BF	N/A	37.8	27.6		17.4				20.3
47	14	4	40-50 cm	Dart Point	Kent		21.1	21.1	7.9	11.8	9.0	8.9	5.0
48	14	6	60-70 cm	Retouched Flake/AP	N/A				4.8	10.7			2.1
49	14	6	60-70 cm	Dart Point	Yarbrough		26.1	26.1		16.0	12.6	17.3	6.0
50	14	7	70-80 cm	Dart Point	Untyped	39.9	21.1	20.1	8.6	16.6	8.2	18.3	6.0
51	14	7	70-80 cm	Initial Stage BF	N/A								7.6
52	14	7	70-80 cm	Utilized Flake	N/A								5.6
53	15	5	50-60 cm	Primary Stage BF	N/A		37.8		11.8				21.8
54	15	5	50-60 cm	Dart Point Frag.	Ind.								1.5
55	15	5	50-60 cm	Utilized Flake	N/A								13.7
56	15	6	60-70 cm	Secondary Stage BF	N/A								10.5
57	15	6	60-70 cm	Utilized Flake	N/A								5.8
58	15	6	60-70 cm	Utilized Flake	N/A								5.8
59	15	7	70-80 cm	Dart Point	Kent		19.4	19.4	7.7				5.1
60	16	6	60-70cm	Dart Point	Bulverde	53.3	26.3	25.9	7.9	13.9	11.3	12.4	10.3
61	16	7	70-80 cm	Tested Cobble/Chopper	N/A	57.1	46.0	-2.0	34.0	-4.0	-5.0	-6.0	91.3
62	10	6	60-70 cm	Secondary Stage BF	N/A								9.0

Table 23. Summary of Technological Attributes for Lithic Categories.

Tool No.	Lithic Category	Point Type	Reduction State	Tech State	Cortex	Raw Material	Heat Treatment	Burning	Blank Type	Completeness	Haft Grinding	Impact Fracture
1	Dart Point	Kent	Reworked	Finished	Absent	Edwards	Absent	Absent	Cobble	Whole	Absent	Present
2	Dart Point	Kent	Reworked	Finished	Present	Silicified Wood	Absent	Absent	Indeterminate	Whole	Absent	Present
3	Dart Point Frag.	Ind.	Secondary	Finished	Present	Edwards	Absent	Absent	Indeterminate	Proximal	Absent	N/A
4	Primary Stage BF	N/A	Primary	Indeterminate	Absent	Edwards Sequin	Indeterminate	Present	Indeterminate	Indeterminate	N/A	N/A
5	Dart Point	Bulverde	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Present	Present
6	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Distal	N/A	Absent
7	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Medial	Absent	Indeterminate
8	Initial Stage BF	N/A	Initial	Unfinished	Present	Silicified Wood	Absent	Absent	Cobble	Indeterminate	N/A	N/A
9	Initial Stage BF	N/A	Initial	Unfinished	Absent	Edwards	Absent	Absent	Flake	Whole	N/A	N/A
10	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Distal	Indeterminate	Indeterminate
11	Dart Preform/Frag.	Kent	Primary	Unfinished	Present	Edwards	Absent	Absent	Pebble	Whole	Present	Absent
12	Primary Stage BF	N/A	Primary	Unfinished	Present	Silicified Wood	Absent	Absent	Pebble	Whole	N/A	N/A
13	Dart Preform/Frag.	Ind.	Secondary	Unfinished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Distal	Indeterminate	N/A
14	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Red Chert	Present	Present	Indeterminate	Medial	Indeterminate	N/A
15	Dart Point	Godley-like	Reworked	Finished	Absent	Edwards	Present	Absent	Indeterminate	Whole	Absent	Absent
16	Core	N/A	Initial	N/A	Present	Edwards	Absent	Absent	Pebble	Whole	N/A	N/A
17	Secondary Stage BF	N/A	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Proximal-Medial	Present	Indeterminate
18	Utilized Flake	N/A	N/A	N/A	Present	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
19	Dart Point	Palmillas	Reworked	Finished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Whole	Absent	Absent
20	Dart Preform/Frag.	N/A	Primary	Unfinished	Present	Edwards	Absent	Absent	Cobble	Whole	N/A	N/A
21	Dart Point	Kent	Secondary	Finished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Proximal-Medial	Absent	Indeterminate
22	Dart Point	Kent	Secondary	Finished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Whole	Absent	Absent
23	Utilized Flake	N/A	N/A	N/A	Absent	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
24	Dart Preform/Frag.	Ind.	Primary	Unfinished	Present	Edwards	Absent	Absent	Indeterminate	Medial	N/A	N/A
25	Dart Point	Kent	Secondary	Finished	Present	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Absent
26	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Proximal	Absent	Indeterminate
27	Dart Point	Ensor	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Present
28	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Medial	Indeterminate	Indeterminate
29	Secondary Stage BF	N/A	Secondary	Indeterminate	Absent	Edwards	Absent	Present	Indeterminate	Indeterminate	N/A	N/A
30	Dart Point	Untyped	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Present
31	Dart Point Frag.	Ellis-like	Secondary	Finished	Absent	Unid. Banded	Absent	Absent	Indeterminate	Proximal-Medial	Absent	Present
32	Dart Point	Kent	Secondary	Finished	Present	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Absent
33	Dart Point Frag.	Kent	Secondary	Finished	Present	Edwards	Absent	Absent	Indeterminate	Proximal-Medial	Absent	Indeterminate
34	Dart Point	Ellis-like	Reworked	Finished	Absent	Edwards	Indeterminate	Present	Indeterminate	Whole	Present	Indeterminate
35	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Indeterminate	Indeterminate	Present	Indeterminate	Indeterminate	Indeterminate	Indeterminate
36	Dart Point	Kent	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Absent
37	Dart Point Frag.	Ind.	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Medial	Indeterminate	Indeterminate
38	Dart Point	Gary	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Absent
39	Dart Point	Gary	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Present
40	Dart Point	Gary	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Present
41	Dart Point	Gary	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Present

Table 23. Continued.

Tool No.	Lithic Category	Point Type	Reduction State	Tech State	Cortex	Raw Material	Heat Treatment	Burning	Blank Type	Completeness	Haft Grinding	Impact Fracture
42	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Distal	Indeterminate	Absent
43	Dart Point Frag.	Ind.	Secondary	Finished	Present	Edwards	Absent	Absent	Indeterminate	Proximal	Absent	Indeterminate
44	Dart Point	Gary	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Absent
45	Utilized Flake	N/A	N/A	N/A	Absent	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
46	Initial Stage BF	N/A	Initial	Unfinished	Present	Edwards	Absent	Absent	Pebble	Whole	N/A	N/A
47	Dart Point	Kent	Secondary	Finished	Present	Edwards	Absent	Absent	Flake	Proximal-Medial	Absent	N/A
48	Retouched Flake/AP	N/A	Reworked	Finished	Absent	Edwards Sequin	Absent	Absent	Flake	Whole	Absent	Present
49	Dart Point	Yarbrough	Reworked	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Proximal	Absent	Indeterminate
50	Dart Point	Untyped	Reworked	Finished	Present	Edwards	Absent	Absent	Indeterminate	Whole	Absent	Indeterminate
51	Initial Stage BF	N/A	Initial	Unfinished	Present	Edwards	Absent	Absent	Indeterminate	Proximal	N/A	N/A
52	Utilized Flake	N/A	N/A	N/A	Absent	Edwards Sequin	Absent	Absent	N/A	Whole	N/A	N/A
53	Primary Stage BF	N/A	Primary	Unfinished	Present	Edwards	Absent	Absent	Cobble	Medial-Distal	N/A	N/A
54	Dart Point Frag.	Ind.	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Distal	Indeterminate	Indeterminate
55	Utilized Flake	N/A	N/A	N/A	Present	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
56	Secondary Stage BF	N/A	Secondary	Finished	Absent	Edwards Sequin	Absent	Absent	Indeterminate	Indeterminate	N/A	N/A
57	Utilized Flake	N/A	N/A	N/A	Absent	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
58	Utilized Flake	N/A	N/A	N/A	Absent	Edwards	Absent	Absent	N/A	Whole	N/A	N/A
59	Dart Point	Kent	Reworked	Finished	Absent	Edwards Sequin	Absent	Absent	Indeterminate	Whole	Absent	Absent
60	Dart Point	Bulverde	Reworked	Finished	Absent	Silicified Wood	Absent	Absent	Indeterminate	Whole	Absent	Absent
61	Tested Cobble/Chopper	N/A	Initial	N/A	Present	Edwards	Absent	Absent	Cobble	Whole	N/A	N/A
62	Secondary Stage BF	N/A	Secondary	Finished	Absent	Edwards	Absent	Absent	Indeterminate	Indeterminate	N/A	N/A

Figure 39. Dart points. (a-i) Kent; (j-l) Gary.

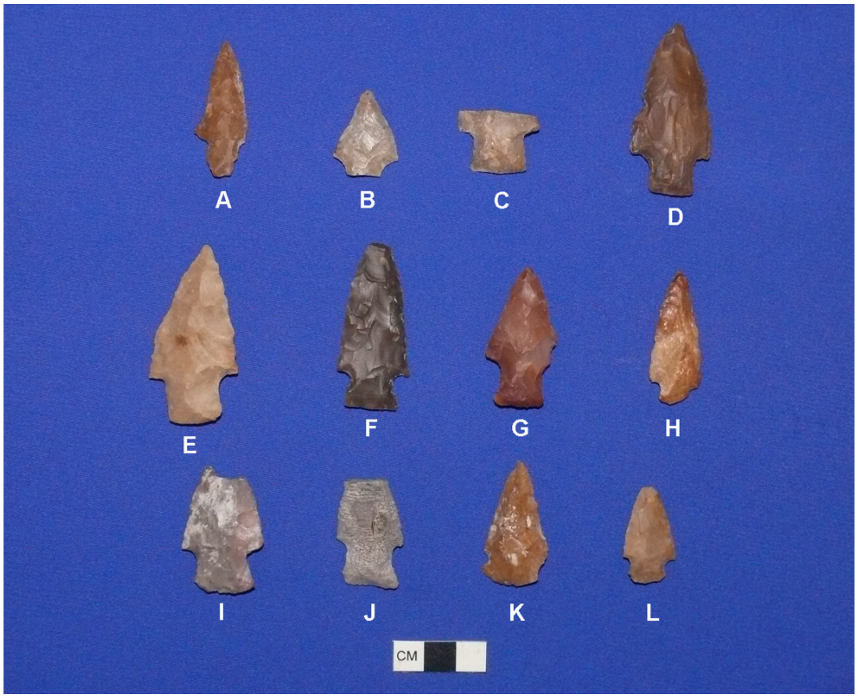


Figure 40. Dart points, (a-b) Gary; (c) Yarbrough; (d-e) Bulverde; (f) Ensor; (g) Godley-like; (h) Palmillas; (i-j) Ellis-like; (k-l) untyped.

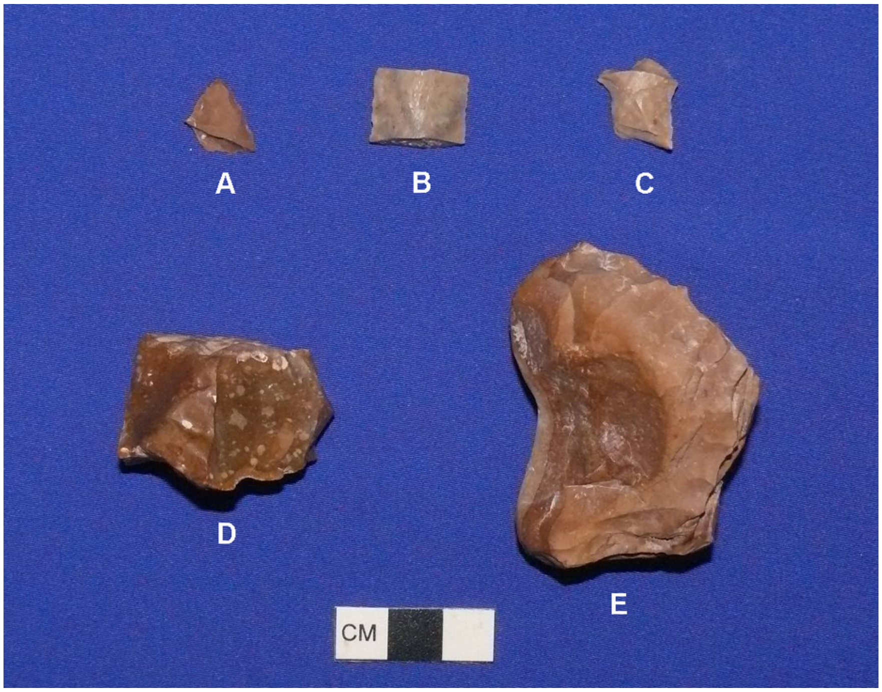


Figure 41. (a) dart point distal fragment; (b) dart point medial fragment; (c) dart point proximal fragment; (d) core; (e) tested cobble/chopper.

Figure 42. Dart point performs, initial, primary, secondary stage bifaces, retouched flake/arrowpoint. (a-b) dart point perform; (c-d) initial stage biface; (e-f) primary stage biface; (g-h) secondary stage biface; (i) retouched flake/arrowpoint.

Raw Materials

The vast majority of stone tools and lithic debris recovered at 41HR1114 are of fine-grained Edwards cobble chert (94.5 percent) which appears to be derived from a secondary source such as the Brazos River some 20 miles to the west. Other potential source areas include the lower reaches of the Trinity and San Jacinto rivers to the east and the Colorado River further west (Ensor and White 1998). It is noted that fine-grained silicified wood, also available in the Brazos, Trinity, and San Jacinto drainages was used to some extent by site inhabitants (5 percent). This siliceous material occurs as alluvial chert clasts, from pebble to cobble size with a well-developed alluvial cortex. Analysis of debitage, cores, and initial stage biface material from 41HR1114 indicates that alluvial pebble/cobbles were the preferred lithic source for site residents. Based on the size of tools found at the site it is estimated that alluvial cobbles ranging from 4-6 cm in length were preferred.

The majority of the Edwards-derived chert ranges from pale yellowish brown and dusky yellowish brown to moderate and dark yellowish brown in color. However, dusky red to grayish red and very dark red colors also occur along with olive gray and brownish gray. The remainder of the siliceous material found at the site constitutes less than one percent. A few examples of a very dark brown translucent variety of Edwards chert common to the Seguin area of Texas were found. One unidentified chert is present, a medium light gray banded chert that possesses a medium texture with closely spaced dark gray narrow bands. Its only occurrence is on an Ellis-like dart point. No tools were made of quartzite although a few quartzite flakes were found during the flake debris analysis. Overall the procurement of raw material appears similar to that at the Eagle's Ridge site along the Southeast Texas coast during the Middle to Late Archaic periods, where fine-grained Edwards pebble-cobble chert was commonly in use (Ensor and White 1998). One difference however appears to be less reliance on silicified wood during the Late Archaic period at site 41HR1114 than at Eagle's Ridge.

Flaked Stone Tool Descriptions

Dart Points and Dart Point Fragments

<u>Specimen 1</u>. (Figure 27-A). This stemmed dart point is complete and is manufactured from fine-grained, unheated dark yellowish brown (10YR4/2) chert. It was recovered from ST 54, Level 8, 80-90 cmbs at site 41HR1114 during Phase I survey. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex was detected. This dart point has been bifacially percussion flaked with pressure retouch and slight blade edge beveling is present. Resharpening is also present along blade margins. Macroscopic evidence of use-wear is present along blade margins with step fracturing and edge crushing noted. The dart point possesses an impact fracture. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. It has been modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is straight, and the shoulders are

slightly incurvate to straight and tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 52.5 mm, maximum width 22.5 mm, shoulder width 22.3 mm; thickness 9.1 mm, juncture width 14.6 mm, haft element length 11.0 mm; and basal width 11.0 mm. It weighs 9.4 grams.

This specimen has been classified as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 2. (Figure 27-B). This stemmed dart point is complete and made of fine-grained, unheated dark yellowish brown (10YR4/2) silicified wood. The silicified wood has a high gloss or sheen. It was recovered from Unit 3, Level 4, 30-40 cmbs at site 41HR1114 during Phase II testing. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and very small patches of white cortex appear to be present on one blade surface. The point exhibits bifacial percussion flaking with pressure retouch and resharpening present along blade margins. Macroscopic evidence of use-wear is also present along blade margins in the form of step flaking. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed perpendicular to the midline. The blade edges are generally straight, the base is straight and the shoulders are straight and tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 33.4 mm, maximum width 19.8 mm, thickness 7.3 mm, juncture width 13.2 mm, shoulder width 19.8 mm, basal width 9.4 mm, and haft element length 12.7 mm. It weighs 4.1 grams.

This point is classified as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 5. (Figure 28-E). This intact, stemmed dart point is made of unheated, fine-grained dark yellowish brown (10YR4/2) to olive gray (5Y4/1) chert with occasional small white (N9/) fossiliferous inclusions. It was recovered from Unit 3, Level 8, 70-80 cmbs at site 41HR1114 during Phase II testing. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking with pressure retouch and resharpening present along one blade margin. Macroscopic evidence of use-wear is present along blade margins. The haft element is well thinned by percussion flaking and the basal margin is slightly ground. The dart point was modified for hafting by the execution of alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is straight to slightly excurvate, and the shoulders are straight to slightly tapered. The lateral haft element edges are generally parallel although one lateral margin is slightly expanding. The following measurements were obtained: length 50.9 mm, maximum width 23.6 mm, thickness 4.5 mm, juncture width 12.7 mm, shoulder width 23.6 mm, basal width 11.9 mm, and haft element length 8.6 mm. It weighs 11.5 grams.

This point has been classified as Bulverde. Bulverde points are believed to date after 2500 B.C. in Southeast Texas or to the Late Middle Archaic period. Ensor and White (1998) have dated Bulverde points to between 2300 B.C. and 1500 B.C. at the Eagle's Ridge site along the upper Texas coast. They most likely date to between 2000 B.C. and 1500 B.C. based on the available data.

Specimen 15. (Figure 28-G). This intact dart point appear to be made of heated, fine-grained dusky red (5R3/4) to grayish red (5R4/2) chert. It was recovered from Unit 8, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery efforts. It appears to have been heat treated and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking with pressure retouch and resharpening/beveling present along blade margins. Macroscopic evidence of use-wear is present in the form of heavy step flaking and edge crushing. The blade edges are generally straight, the base is straight, and the shoulders are straight and tapered. The lateral haft element edges are incurvate and slightly expanding. The following measurements were obtained: length 43.6 mm, maximum width 22.7 mm, thickness 11.1 mm, juncture width 13.6 mm, shoulder width 20.8 mm, basal width 14.6 mm, and haft element length 13.3 mm. It weighs 7.8 grams.

It appears that the point may be classified as Godley-like. Godley points have been dated to the transitional Archaic period in central Texas although it may occur slightly earlier by A.D. 200 according to Turner and Hester (1993). Godley-like forms are associated with the Late Archaic-Clear Lake periods at the Eagle's Ridge site along the upper Texas Coast (Ensor and White 1998).

Specimen 19. (Figure 28-H). This stemmed dart point is almost complete and is made of fine-grained, unheated moderate brown (5YR4/4) to moderate yellowish brown (10YR5/4) silicified wood. The silicified wood has a high gloss or sheen. It was recovered from Unit 10, Level 5, 50-60 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex. The point exhibits bifacial percussion flaking with pressure retouch and resharpening present along blade margins. Macroscopic evidence of use-wear is also present along blade margins in the form of step flaking. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. A transverse fracture has removed a small portion of the basal margin. This dart point was modified for hafting by alternating percussion blows directed diagonally to the midline. The blade edges are generally straight to slightly excurvate, the base is straight and the shoulders are incurvate and horizontal. The lateral haft element edges are incurvate and expanding. The following measurements were obtained: length 42.7 mm, maximum width 17.1 mm, shoulder width 16.9; thickness 16.8

mm, juncture width 10.2 mm, basal width 9.6 mm, and haft element length 6.9 mm. It weighs 4.6 grams.

This point may be related to the Palmillas type of Southeast Texas. Though not well dated in Southeast Texas, Palmillas points have been placed within a Middle-Late time-frame by a number of researchers including Story (1990) and Ensor (1990). Turner and Hester (1993) assign this type to the Middle-Late Archaic periods. Ensor (1990) has suggested a time span of 1500 B.C. to 1000 B.C for this type with the understanding that an accurate chronological placement is problematic.

Specimen 21. (Figure 27-I). This stemmed dart point has a broken blade and is manufactured from fine-grained, unheated moderate brown (5YR3/4) silicified wood with patches of very dark red (5Y2/6) on one surface. It was recovered from Unit 10, Level 6, 50-60 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is plano-convex and no cortex was detected. This dart point has been bifacially percussion flaked with little to no pressure retouch. No resharpening is evident along blade margins. No macroscopic evidence of use-wear was detected. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point has been modified for hafting by alternating percussion blows directed diagonally to the midline. The blade edges appear to be generally straight (most of blade is gone). The base is excurvate and the shoulders are straight and tapered. The lateral haft element edges are straight and slightly contracting. The following measurements were obtained: length indeterminate; maximum width 23.0 mm, shoulder width 22.8, thickness 7.4 mm, juncture width 14.4 mm, haft element length 13.4; basal width 5.9. The point proximal fragment weighs 3.6 grams.

This point is typed as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 22. (Figure 27-D). This stemmed dart point is complete and is manufactured from fine-grained, unheated moderate yellowish brown (10YR5/4) to dark yellowish brown (10YR4/2) silicified wood. It was recovered from Unit 10, Level 7, 70-80 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex was detected. This dart point has been bifacially percussion flaked with minor pressure retouch. Little to no resharpening is evident along blade margins. Macroscopic evidence of use-wear is limited along blade margins with a few small step fractures noted. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is straight and the shoulders are slightly incurvate to straight and slightly tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 46.0 mm, maximum width 23.0 mm, shoulder width 23.0; thickness 10.6 mm, juncture width 13.8 mm, haft element length 14.1; basal width 12.3 mm. It weighs 7.1 grams.

This point is also assigned to the Kent type. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 25. (Figure 27-C). This stemmed dart point is complete and is manufactured from fine-grained, unheated pale yellowish brown (10YR6/2) chert. It was recovered from Unit 11, Level 7, 70-80 cmbs at site 41HR1114 during Phase III data recovery. It has not been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and a small patch of cortex covers the basal margin. This dart point has been bifacially percussion flaked on opposing surfaces and with minor secondary retouch present along one blade margin. There is no evidence of resharpening along blade margins. Macroscopic evidence of use-wear is not present along blade margins. No haft element grinding is detectable and the point was modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight to slightly excurvate, the base is straight and the shoulders are straight and tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 47.3 mm, maximum width 17.4 mm, shoulder width 17.4 mm; thickness 9.6 mm, juncture width 11.8 mm, haft element length 10.7 mm; and basal width 10.5 mm. It weighs 6.2 grams.

This specimen is classified as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 27. (Figure 28-F). This stemmed dart point is mainly complete and is manufactured from extremely fine-grained dusky yellowish brown (10YR2/2) chert. It was recovered from Unit 11, Level 5, 54 cmbs at site 41HR1114 during Phase III data recovery. The nature of the original blank is unclear and the cross-section is biconvex. No cortex is present. This dart point has been carefully bifacially percussion flaked with extensive pressure retouch. Resharpening is evident along blade margins. The tip has a large impact fracture. Macroscopic evidence of use-wear is common along blade margins in the form of step fracturing and edge crushing. The haft element has been thinned by percussion flaking and pressure retouch. This dart point was modified for hafting by alternating percussion blows directed diagonally to the midline. The blade edges are generally straight, the base is straight and the shoulders are incurvate and horizontal to barbed. The lateral haft element edges are slightly recurvate and expanding. The following measurements were obtained: length indeterminate; maximum width 23.2

mm, shoulder width 23.0 mm; thickness 6.0 mm, juncture width 13.3 mm, haft element length 10.9 mm; and basal width 16.8 mm. It weighs 7.3 grams.

This point is classified as Ensor. The Ensor point is most closely associated with the Transitional-Archaic period in central Texas from about 200 B.C-A.D. 600 (Turner and Hester 1993) although it is occasionally found in Southeast Texas.

Specimen 30. (Figure 28-L). This small, stemmed dart point is complete and is manufactured from fine-grained, unheated moderate yellowish brown (10YR5/4) to pale yellowish brown (10YR6/2) chert. It was recovered from Unit 11, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex was detected. This dart point has been bifacially percussion flaked with minor pressure retouch along blade margins. Little to no resharpening of the blade is evident. Macroscopic evidence of use-wear is limited along blade margins with a few small step fractures noted. An apparent impact fracture is present on the tip of the blade. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed diagonally to the midline and the haft element is well thinned. The blade edges are straight, the base is straight and the shoulders are slightly incurvate and horizontal to slightly tapered. The lateral haft element edges are incurvate and expanding. The following measurements were obtained: length 32.3 mm, maximum width 18.0 mm, shoulder width 17.8; thickness 6.2 mm, juncture width 12.4 mm, haft element length 6.9 mm; and basal width 11.7 mm. The point weighs 3.0 grams. This point is untyped although it vaguely resembles the Trinity/Palmillas types.

Specimen 31. (Figure 28-J). This proximal-medial dart point fragment is manufactured from an unidentified medium light gray banded chert. The narrow bands are closely spaced and dark gray (N3/0) in color. It was recovered from Unit 11, Level 6, 68 cmbs during Phase III data recovery. The nature of the original blank is unclear and the cross-section is biconvex. No cortex is present although several large internal inclusions or impurities are present. This dart point has been bifacially percussion flaked with some pressure retouch along blade margins. The distal portion of the blade is fractured which may be the result of impact. Macroscopic evidence of use-wear is minimal along blade margins. The haft element has been thinned by percussion flaking. This dart point was modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is straight and the shoulders are incurvate and tapered. The lateral haft element edges are slightly incurvate and expanding. The following measurements were obtained: length indeterminate, maximum width 16.2 mm, shoulder width 16.2 mm, thickness 8.4 mm, juncture width 14.7 mm, haft element length 12.6 mm, and basal width 17.0 mm. It weighs 5.8 grams.

This point is classified as Ellis-like. The Ellis type is most common in central Texas where it is dated to a general time span from Middle to Late Archaic to Transitional Archaic from 2000 B.C. to around A.D. 700 (Turner and Hester 1993).

Specimen 32. (Figure 27-E). This stemmed dart point is complete and is manufactured from medium-grained, unheated moderate yellowish brown (10YR5/4) to moderate brown (5YR4/4) chert. It was recovered from Unit 11, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear although remnant patches of cortex may indicate that a pebble was used. The cross-section is biconvex and cortex was detected. This dart point has been bifacially percussion flaked with minor pressure retouch. Little to no resharpening is evident along blade margins. Macroscopic evidence of use-wear is present primarily along one blade margin with a step fracturing and edge crushing noted. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed diagonally to the midline. The blade edges are generally straight, the base is straight and the shoulders are slightly incurvate to straight and tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 43.5 mm, maximum width 24.5 mm, shoulder width 24.5 mm; thickness 8.2 mm, juncture width 14.2 mm, haft element length 11.5 mm; and basal width 11.6 mm. It weighs 7.9 grams.

This point is typed as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 33. (Figure 27-F). This stemmed dart point fragment is represented by the haft element and a portion of the blade. It is manufactured from medium-grained, unheated pale yellowish brown (10YR6/2) chert. It was recovered from Unit 11, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and cortex covers the basal margin. This dart point has been bifacially percussion flaked with virtually no secondary retouch. No resharpening is evident along blade margins. Macroscopic evidence of use-wear is very limited. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is straight and the shoulders are straight and slightly tapered. The lateral haft element edges are straight and parallel. The following measurements were obtained: length indeterminate, maximum width 24.0 mm, shoulder width 24.0, thickness 9.7 mm, juncture width 15.6 mm, haft element length 10.5 mm, and basal width 11.6 mm. It weighs 6.4 grams.

This dart point is also typed as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 34. (Figure 28-I). This expanding stem dart point is largely complete and is manufactured from fine-grained medium dark gray (N4/0) chert that has been burned. It was recovered from Unit 11, Level 7, 70-80 cmbs at site 41HR1114 during Phase III data recovery. It has been burned as noted above and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. This dart point has been bifacially percussion flaked with minor pressure retouch. Minor resharpening is evident along blade margins. The tip has a crenated fracture that is the result of extreme heat. Macroscopic evidence of use-wear is limited along blade margins. The haft element has been thinned by percussion flaking and minor haft element grinding is present along the basal margin. This dart point was modified for hafting by alternating percussion blows directed diagonally and perpendicular to the midline. The blade edges are generally straight, the base is slightly excurvate and the shoulders are slightly tapered. The lateral haft element edges are incurvate to straight and expanding. The following measurements were obtained: length indeterminate, maximum width 26.3 mm, shoulder width 26.3 mm, thickness 9.0 mm, juncture width 16.3 mm, haft element length 13.4, and basal width 18.8 mm. It weighs 8.7 grams.

This point is classified as Ellis-like. The Ellis type is most common in central Texas where it is dated to a general time span from Middle to Late Archaic to Transitional Archaic from 2000 B.C. to around A.D. 700 (Turner and Hester 1993).

Specimen 36. (Figure 27-G). This small, largely intact dart point is made of unheated, fine-grained dark yellowish brown (10YR4/2) to brownish gray (5YR4/1) chert. Occasional small, white (N9/) specks are visible in the dark chert matrix. It was recovered from Unit 11, Level 7, 78 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits finely executed bifacial percussion flaking and extensive pressure retouch that has resulted in blade beveling and extensive resharpening of blade margins. Macroscopic evidence of use-wear is present along both blade margins in the form of edge crushing and step flaking. The haft element is minimally thinned by percussion flaking and a transverse fracture forms the basal margin. The dart point was modified for hafting by the execution of percussion blows applied perpendicular to the midline. The blade edges are generally straight, the base is straight, and the shoulders are straight and tapered. The lateral haft element edges are generally parallel and straight. The following measurements were obtained: length 40.2 mm, maximum width 14.7 mm, thickness 6.1 mm, juncture width 10.6 mm, shoulder width 13.7 mm, basal width 9.3 mm, and haft element length 7.9 mm. It weighs 3.8 grams.

This point is typed as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 38. (Figure 28-A). This small, intact stemmed dart point is made of unheated, fine-grained dark yellowish brown (10YR4/2) to moderate yellowish-brown (10YR5/4) chert. It was recovered from Unit 12, Level 5, 50-60 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking with minor pressure retouch along certain portions of the blade and resharpening is present along both blade margins. Macroscopic evidence of use-wear is present along blade margins. One shoulder has been fractured. The haft element is well thinned by percussion flaking. The dart point was modified for hafting by the execution of percussion blows directed perpendicular to the midline. The blade edges are generally incurvate to straight, the base is straight and the shoulders are straight and strongly tapered. The lateral haft element edges are generally parallel and slightly contracting. The following measurements were obtained: length 44.3 mm, maximum width 16.6 mm, thickness 6.3 mm, juncture width 10.0 mm, shoulder width 16.6 mm, basal width 5.3 mm, and haft element length 11.8 mm. It weighs 3.3 grams.

This point is typed as Gary. The Gary point is thought to post-date 500 B.C. in Southeast Texas (Story 1990). They appear to mainly follow Kent points in time and a time range of between 100 B.C. and A.D. 800 is suggested for this type across Southeast Texas (Ensor and White 1998).

Specimen 39. (Figure 28-B). This small, largely intact dart point is made of unheated, fine-grained light olive gray (5Y5/2) to pale yellowish brown (10YR6/2) chert. It was recovered from Unit 12, Level 5, 50-60 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking and extensive pressure retouch is present along blade margins. Pressure retouch has resulted in extensive resharpening of blade margins. Macroscopic evidence of use-wear is present along both blade margins in the form of heavy edge crushing, step flaking, and edge rounding. The proximal portion of the haft element has been transversely fractured. The haft element is well thinned by percussion flaking. The dart point was modified for hafting by the execution of percussion blows directed diagonally to the midline. The blade edges are generally straight, the base is fractured, and the shoulders are straight and tapered. The lateral haft element edges are generally parallel and contracting. The following measurements were obtained: length 44.3 mm, maximum width 16.6 mm, thickness 6.3 mm, juncture width 10.0 mm, shoulder width 16.6 mm, basal width 5.3 mm, and haft element length 11.8 mm. It weighs 2.9 grams.

This specimen is classified as Gary. The Gary point is thought to post-date 500 B.C. in Southeast Texas (Story 1990). They appear to mainly follow Kent points in time and a time range of between 100 B.C. and A.D. 800 is suggested for this type across Southeast Texas (Ensor and White 1998).

Specimen 40. (Figure 27-K). This small, intact dart point is made of unheated, fine-grained grayish-orange (10YR7/4) to pale yellowish brown (10YR6/2) chert. It was recovered from Unit 12, Level 5, 50-60 cmbs at site 41HR1114 during Phase III data recovery efforts. The cross-section is biconvex and no cortex is present. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The point exhibits bifacial percussion flaking with no pressure retouch. Very little evidence of macroscopic use-wear is present, however the tip possesses a prominent impact fracture. The haft element is well thinned by percussion flaking. The dart point was modified for hafting by the execution of percussion blows directed diagonally to the midline. The blade edges are generally straight, the base is straight, and the shoulders are straight and tapered. The lateral haft element edges are generally parallel and contracting. The following measurements were obtained: length 35.7 mm, maximum width 19.5 mm, thickness 6.8 mm, juncture width 10.7 mm, shoulder width 19.5 mm, basal width 4.4 mm, and haft element length 7.9 mm. It weighs 3.0 grams.

This point is typed as Gary. The Gary point is thought to post-date 500 B.C. in Southeast Texas (Story 1990). They appear to mainly follow Kent points in time and a time range of between 100 B.C. and A.D. 800 is suggested for this type across Southeast Texas (Ensor and White 1998).

Specimen 41. (Figure 27-L). This small, intact stemmed dart point is made of unheated, fine-grained dark yellowish brown (10YR4/2) to moderate yellowish-brown (10YR5/4) chert. It was recovered from Unit 12, Level 5, 50-60 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned. The nature of the original blank is unclear although the basal margin consists of a flat plane that could be the original striking platform for a flake blank. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking with minor pressure retouch along a portion of the distal blade margin. This area appears to have been resharpened. Macroscopic evidence of use-wear is present along one blade margin in the form of step fracturing and edge blunting. The dart point was modified for hafting by the execution of percussion blows directed perpendicular and diagonally to the midline. The blade edges are generally straight, the base is straight, and the shoulders are straight and strongly tapered. The lateral haft element edges are generally parallel and contracting. The following measurements were obtained: length 33.6 mm, maximum width 14.9 mm, thickness 5.9 mm, juncture width 10.1 mm, shoulder width 14.9 mm, basal width 6.2 mm, and haft element length 6.7 mm. It weighs 2.6 grams.

This dart point is classified as Gary. The Gary point is thought to post-date 500 B.C. in Southeast Texas (Story 1990). They appear to mainly follow Kent points in time and a time range of between 100 B.C. and A.D. 800 is suggested for this type across Southeast Texas (Ensor and White 1998).

Specimen 44. (Figure 27-J). This contracting stem dart point is complete and is manufactured from fine-grained, unheated pale yellowish brown (10YR6/2) chert. It was recovered from Unit 13, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and a median ridge is present on opposing blade surfaces due to resharpening. No cortex was detected. This dart point has been bifacially percussion flaked with pressure retouch common along blade margins. Resharpening is evident which has resulted in extensive blade edge beveling. Macroscopic evidence of use-wear is evident along blade margins in the form of heavy step fracturing and edge crushing. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed primarily perpendicular to the midline. The blade edges are generally straight, the base is straight and the shoulders are straight and tapered. The lateral haft element edges are straight and contracting. The following measurements were obtained: length 48.8 mm, maximum width 16.7 mm, shoulder width 16.3 mm, thickness 8.0 mm, juncture width 12.3 mm, haft element length 13.6 mm; and basal width 6.1 mm. The point weighs 5.5 grams.

This point is typed as Gary. The Gary point is thought to post-date 500 B.C. in Southeast Texas (Story 1990). They appear to mainly follow Kent points in time and a time range of between 100 B.C. and A.D. 800 is suggested for this type across Southeast Texas (Ensor and White 1998).

Specimen 47. (Figure 27-H). A largely complete dart point was recovered from Unit 14, Level 4, 40-50 cmbs during Phase III data recovery efforts. It is made of medium to fine-grained pale yellowish brown (10YR6/2) to moderate yellowish-brown (10YR5/4) chert. This specimen retains small patches of cortex on what appears to be the dorsal flake surface. The opposing surface is largely smooth with minor percussion flaking along one blade margin and the haft element. This may indicate that a flake blank was used in manufacture. This artifact exhibits percussion flake scars across one blade surface and a few additional percussion scars are noted which form a rudimentary haft element. No pressure flaking is present. There is no evidence of heat treatment or burning. It appears that initial edging and some primary thinning were accomplished during point manufacture. A small knot along one margin and a transverse blade fracture appears to be one reason for the crude appearance of the point. There is no macroscopic evidence of tool use. The following measurements were obtained: length indeterminate, maximum width 21.1 mm, shoulder width 21.1 mm, thickness 7.9 mm, haft element length 9.0 mm, juncture width 11.8 mm, and basal width 8.9 mm. It weighs 5.0 grams.

This dart point appears to conform to the Kent dart point based on the overall haft element form and shoulder configuration. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle’s Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 50. (Figure 28-K). This stemmed dart point is intact and made of fine-grained, unheated moderate yellowish brown (10YR5/4) chert. It was recovered from Unit 14, Level 7, 70-80 cmbs at site 41HR1114 during Phase III data recovery. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex. The point exhibits bifacial percussion flaking with pressure retouch and resharpening is present along blade margins. A large portion of one surface of the point is smooth and contains no flake scars suggesting it represents either the ventral surface of a flake blank or a single large thinning flake scar. Macroscopic evidence of use-wear is not common along blade margins. The haft element has been thinned by percussion flaking and no haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed perpendicular to the midline creating a shallow side-notched effect. The blade edges are generally straight, the base is excurvate and the shoulders are incurvate and tapered. The lateral haft element edges are incurvate and expanding. The following measurements were obtained: length 39.9 mm, maximum width 21.1 mm, shoulder width 20.1; thickness 8.6 mm, juncture width 16.6 mm, basal width 18.3 mm, and haft element length 8.2 mm. It weighs 6.0 grams. This point is untyped although it resembles the Palmillas type of Southeast Texas.

Specimen 59. (not illustrated). This small dart point is made of unheated, fine-grained dusky yellowish brown (10YR2/2) silicified wood. It was recovered from Unit 15, Level 7, 70-80 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex and no cortex is present. The point exhibits bifacial percussion flaking with pressure retouch and resharpening/beveling is present along blade margins. Macroscopic evidence of use-wear is present in the form of step flaking and edge crushing. The haft element has been transversely fractured. The blade edges are generally straight, the base is fractured and the shoulders are straight and strongly tapered. The lateral haft element edges are fractured. The following measurements were obtained: length indeterminate, maximum width 19.4 mm, thickness 7.7 mm, juncture width indeterminate, shoulder width indeterminate, basal width indeterminate, and haft element indeterminate. It weighs 5.1 grams.

Even though the haft element is fractured, it appears that the point may be classified as Kent. Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 60. (Figure 28-D). This dart point is complete and made of fine-grained, unheated dark yellowish brown (10YR4/2) silicified wood very similar to Specimen 2. The silicified wood has a high gloss or sheen. It was recovered from Unit 16, Level 6, 60-70 cmbs at site 41HR1114 during Phase III data recovery efforts. It does not appear to have been heat treated or burned and the nature of the original blank is unclear. The cross-section is biconvex. The point exhibits bifacial percussion flaking with pressure retouch and resharpening present along blade margins. A large percussion flake removal along one lateral blade margin has resulted in a notched effect. Macroscopic evidence of use-wear is also present along blade margins in the form of step flaking and the tip appears to retain evidence of minor crushing. The haft element has been thinned by percussion flaking with possible minor pressure retouch along the basal margin. No haft element grinding is detectable. This dart point was modified for hafting by alternating percussion blows directed diagonally to the midline. The blade edges are slightly excurvate, the base is straight and the shoulders are incurvate and slightly barbed. The lateral haft element edges are straight and parallel. The following measurements were obtained: length 55.3 mm, maximum width 26.3 mm, thickness 7.9 mm, juncture width 13.9 mm, shoulder width 25.9 mm, basal width 12.4 mm, and haft element length 11.3 mm. It weighs 10.3 grams.

This point is classified as Bulverde. Bulverde points are believed to date after 2500 B.C. in Southeast Texas or to the Late Middle Archaic period. Ensor and White (1998) have dated Bulverde points to between 2300 B.C. and 1500 B.C. at the Eagle's Ridge site along the upper Texas coast. They most likely date to between 2000 B.C. and 1500 B.C. based on the available data.

Specimen 3. (not illustrated). The extreme proximal portion of a finished dart point made of unheated moderate yellowish brown (10YR5/4) chert was recovered from Trench 1, Unit 3, Level 6, 60-70 cmbs at 41HR1114 during excavations. The chert is fine-grained and glossy. A small patch of cortex is present along the base. The nature of the original objective piece is unknown. Both faces of the stem have been bifacially percussion flaked with no pressure retouch. A transverse haft snap indicates the point was broken during use. No secondary retouch or grinding was noted. No linear measurements were taken owing to its fragmentary condition however, it weighs 1.0 gram. No assignment of age or cultural affiliation is possible.

Specimen 6. (not illustrated). The distal portion of a finished dart point was recovered from Unit 3 in wall slump at 41HR1114. It is made of dark yellowish-brown (10YR4/2) chert and well-executed bifacial percussion thinning flake scars cover both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning. Pressure retouch is present along blade margins and the broken distal portion of the point shows macroscopic evidence of use along blade margins primarily in the form of step fracturing. It possesses a transverse snap fracture that appears to have occurred during use. It seems this biface fragment represents a portion of a dart point broken during use. No linear measurements were taken owing to its fragmentary condition, however it weighs 3.6 grams. No assignment of age or cultural affiliation is possible.

Specimen 7. (not illustrated). The proximal-medial section of a finished dart point was recovered from Trench 3 at 41HR1114 during Phase II testing. It is made of heavily patinated fine-grained olive gray (5Y4/1) chert. The patinated surface is pinkish gray (5YR8/1) in color. Bifacial percussion thinning flake scars cover both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning and no cortex is present. The point has multiple fractures that occurred after manufacture. It is unclear whether the fractures occurred as a result of use or because of unspecified post-depositional factors. No linear measurements were taken owing to its fragmentary condition, however it weighs 7.6 grams. No assignment of age or cultural affiliation is possible, though the contracting stem and apparent barbed shoulders are reminiscent of the Almagre and Langtry forms common to the lower Pecos region of Texas.

Specimen 10. (not illustrated). The distal portion of a finished dart point was recovered from Unit 6, Level 4, 40-50 cmbs at 41HR1114. It is made of fine-grained brownish to olive gray chert (5YR4/1-5Y4/1) and well-executed bifacial percussion/pressure flaking is present on both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning. The broken distal portion of the point shows a tip fracture that may related to use. There is some macroscopic evidence of use along blade margins primarily in the form of step fracturing. This biface fragment represents a portion of a dart point that was apparently broken during use. No linear measurements were taken owing to its fragmentary condition however it weighs 1.0 gram. No assignment of age or cultural affiliation is possible.

Specimen 14. (not illustrated). The medial portion of a finished dart point was recovered from Unit 7, Level 6, 60-70 cmbs at 41HR1114. It is made of dusky red (10R3/4) to grayish red (10R4/2) burned chert that contains occasional small white fossiliferous inclusions. It is likely that the original chert was brownish yellow in color since heat appears to turn the natural brownish yellow chert varying degrees of red. Closely spaced, parallel bifacial thinning flake scars cover both surfaces. The nature of the original blank is unclear. A large pot-lid fracture is present on one surface indicating exposure to extreme heat. Blade margins appear to be slightly serrated and resharpened via pressure retouch. This specimen possesses two transverse fractures that occurred after manufacture was complete. No linear measurements were taken owing to its fragmentary condition, however it weighs 3.0 grams. No assignment of age or cultural affiliation is possible.

Specimen 26. (Figure 29-C). The proximal portion of a finished dart point was recovered from Unit 11, Level 5, 50-60 cmbs at 41HR1114 during Phase III data recovery. It is made of fine-grained pale yellowish-brown (10YR6/2) chert. Bifacial percussion thinning flake scars cover both haft surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning and no cortex is present. It possesses two transverse fractures that appear to have occurred during use. It appears this biface fragment represents the proximal portion of dart point. No linear measurements were taken owing to its fragmentary condition, however it weighs 1.5 grams. No strict assignment of age or cultural affiliation is possible.

Specimen 28. (not illustrated). A medial fragment of a finished dart point was recovered from Unit 11, Level 6, 50-60 cmbs at 41HR1114 during Phase III data recovery. It is made of fine-grained dark yellowish brown (10YR6/2) chert. Bifacial thinning flake scars cover both surfaces and one blade margin segment exhibits pressure retouch. The nature of the original blank is unclear and the cross-section is biconvex. Only one blade margin is partially intact and it shows little macroscopic wear. This specimen evidently fractured during use. No linear measurements were taken owing to its fragmentary condition, however it weighs 1.5 grams. No assignment of age or cultural affiliation is possible.

Specimen 35. (not illustrated). A small indeterminate fragment of a finished dart point was recovered from Unit 11, Level 7, 70-80 cmbs at 41HR1114 during Phase III data recovery. It is made of fine-grained chert that is unidentified due to severe burning and discoloration. Well executed bifacial percussion thinning flake scars cover both haft surfaces. The nature of the original blank is unclear. No cortex is present. It possesses a crenated fracture that appears to have been caused by exposure to extreme heat. It appears this biface fragment represents a portion of finished dart point. No linear measurements were taken owing to its fragmentary condition, however it weighs 1.3 grams. No assignment of age or cultural affiliation is possible.

Specimen 37. (Figure 29-B). The medial portion of a finished dart point was recovered from Unit 12, Level 4, 40-50 cmbs at 41HR1114 during Phase III data recovery. It is made of fine-grained medium gray (N6/) to light olive gray (5Y5/2) chert. Closely spaced, parallel bifacial thinning flake scars cover both surfaces and margins exhibit pressure retouch. The nature of the original blank is unclear and the cross-section is biconvex. Blade margins appear to be resharpened via pressure retouch. This specimen possesses two transverse fractures that occurred after manufacture was complete. No linear measurements were taken owing to its fragmentary condition however it weighs 2.1 grams. No assignment of age or cultural affiliation is possible.

Specimen 42. (Figure 29-A). The distal portion of a finished dart point was recovered from Unit 13, Level 3, 30-40 cmbs at 41HR1114 during Phase III data recovery. It is made of dark yellowish-brown (10YR4/2) chert and well-executed bifacial percussion thinning flake scars cover both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning. Pressure retouch is present along blade margins and the broken distal portion of the point shows macroscopic evidence of use along blade margins primarily in the form of minute step fracturing and edge rounding. It possesses a transverse snap fracture that appears to have occurred during use. This biface fragment represents the distal portion of a dart point broken during use. No linear measurements were taken owing to its fragmentary condition, however it weighs 0.6 gram. No assignment of age or cultural affiliation is possible.

Specimen 43. (not illustrated). The extreme proximal portion of a finished dart point made of medium-grained, unheated moderate yellowish brown (10YR5/4) chert was recovered from Unit 13, Level 6, 60-70 cmbs at 41HR1114 during Phase III excavations. A small patch of cortex is present at the base. The nature of the original objective piece is unknown. Both faces of the stem have been bifacially percussion flaked with no pressure retouch. A transverse haft snap indicates the point was likely broken during use. No secondary retouch or haft grinding was noted. No linear measurements were taken owing to its fragmentary condition, however it weighs 1.3 grams. No assignment of age or cultural affiliation is possible.

Specimen 49. (Figure 28-C). The proximal portion of a finished dart point was recovered from Unit 14, Level 6, 60-70 cmbs at 41HR1114 during Phase III data recovery. It is made of fine-grained brownish-gray (5YR4/1)) to olive gray (5Y4/1) chert with a few small white (N9/) inclusions. There is no indication of heat treatment or burning. The point has been bifacially percussion flaked over the haft element and the small portion of the blade that remains. Minor secondary retouch is present along the base. The nature of the original blank is unclear and the cross-section is biconvex. This specimen possesses a transverse blade fracture that occurred after manufacture was complete. The blade shape is unclear owing to breakage, however the shoulders are horizontal to slightly tapered, the base is straight, and the lateral haft element edges are straight and expanding. The following measurements were obtained: length indeterminate, maximum width 26.1 mm, shoulder width 26.1 mm, thickness indeterminate, juncture width 16.0 mm, haft element length 12.6 mm, and basal width 17.3 mm. The point fragment weighs 6.0 grams.

This dart point appears to conform to the Yarbrough type in southeast Texas. The Yarbrough type has traditionally been assigned to Late Archaic sites after Johnson (1962). Quigg and Ellis (1994) have dated a context in central Texas that contained a Yarbrough point to between 4,000 and 4400 B.P. An estimated time span between 4,000 B.C. and 2000 B.C. is suggested by the data.

Specimen 54. (not illustrated). The distal portion of a finished dart point was recovered from Unit 15, Level 5, 50-60 cmbs at 41HR1114. It is made of medium-grained brownish gray (5YR4/1) to light brownish gray chert (5YR6/1) and well-executed bifacial percussion/pressure flaking is present on both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning. The broken distal portion of the point shows a tip fracture that may related to use. This biface fragment represents a portion of a dart point that was apparently broken during use. No linear measurements were taken owing to its fragmentary condition, however it weighs 1.5 grams. No assignment of age or cultural affiliation is possible.

Dart Point Preform/Preform Fragments

Specimen 11. (Figure 30-A). This complete dart point preform made of yellowish-brown chert (10YR5/4) was recovered from Unit 6, Level 6, 60-70 cmbs during Phase III data recovery efforts. This specimen retains patches of moderate brown (5YR3/4) alluvial cortex on opposing faces indicating that it was made using a pebble. There is no evidence of heat treatment or burning. The artifact has been bifacially percussion flaked across both blade surfaces and the haft element (rudimentary stem) was formed by percussion blows directed diagonally to the midline. The distal portion of the blade exhibits minor secondary retouch which has created a thin, regular margin. Numerous step fracture terminations along lateral blade margins are related to failed thinning attempts. There is no macroscopic evidence of tool use although it is possible the biface was hafted and used in some fashion despite its thickened cross-section. The following measurements were obtained: length 45.5mm, maximum width 25.0 mm, shoulder width 23.1 mm, thickness 13.4 mm, juncture width 13.5 mm, haft element length 10.6 mm, basal width 8.5 mm, It weighs 11.2 grams. This artifact appears to be a preform for a Kent dart point.

Kent points have been dated primarily to between 800 B.C. and A.D. 100 at the Eagle's Ridge shell midden along the upper Texas Coast (Ensor and White 1998). As noted by Ensor and White (1998) while it is possible that Kent points may date slightly earlier to 1500 B.C. it appears that they are confined mainly to the Late Archaic period across Southeast Texas.

Specimen 12. (Figure 30-E). A complete primary stage biface (preform) that was probably intended to be a dart point was recovered from Unit 6, Level 6, 60-70 cmbs. It is made of fine-grained olive gray (5Y4/1) to moderate yellowish-brown (10YR5/4) silicified wood. This specimen retains patches of olive brown (5Y4/1) alluvial cortex indicating that it was made on a pebble. This artifact has been bifacially percussion flaked and no secondary retouch is present. There is no evidence of heat treatment or burning. It appears that initial edging and thinning were accomplished prior to discard. Hinge and step fracture terminations related to thinning attempts and a tabular facet along one margin appear to be the reasons for abandonment. There is no macroscopic evidence of tool use although it is always possible the biface may have been used in some fashion. The following measurements were obtained: length 53.6 mm, maximum width 30.0 mm, thickness 13.8 mm, and weight 17.3 grams. No strict assignment of age or cultural affiliation is possible.

Specimen 13. (not illustrated). The distal portion of an apparent dart point preform was recovered from Unit 7, Level 5, 50-60 cmbs, at 41HR1114. It is made of moderate yellowish-brown (10YR5/4) to brownish gray (5YR4/1) silicified wood. Bifacial percussion thinning flake scars cover both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning. Pressure retouch is not present and blade margins do not show evidence of use. It possesses a transverse end-shock fracture that appears to have occurred during manufacture. Step fractures along one margin indicate difficulty in thinning. It appears this biface fragment represents a dart point manufacture failure. No linear measurements were taken owing to its fragmentary condition, however it weighs 2.9 grams. No assignment of age or cultural affiliation is possible.

Specimen 20. (Figure 30-B). A complete dart point preform was recovered from Unit 10, Level 6, 60-70 cmbs during Phase III data recovery efforts. It is made of medium-grained pale yellowish brown (10YR6/2) to moderate yellowish-brown (10YR5/4) chert. This specimen retains a patch of moderate brown (5YR3/4) alluvial cortex indicating that it was most likely made on a small alluvial cobble. This artifact has been bifacially percussion flaked and secondary retouch is present along one margin. There is no evidence of heat treatment or burning. It appears that initial edging and some primary thinning were accomplished prior to discard. Step fracture terminations related to thinning attempts and a large knot along one margin appear to be the reasons for abandonment. There is no macroscopic evidence of tool use although it is always possible the biface may have been used in some fashion. The following measurements were obtained: length 60.7 mm, maximum width 23.3 mm, thickness 18.9 mm, and weight 16.3 grams. No determination of age or cultural affiliation is possible.

Specimen 24. (not illustrated). The medial portion of an apparent dart point preform was recovered from Unit 11, Level 4, 40-50 cmbs at 41HR1114 during Phase III data recovery. It is made of moderate yellowish-brown (10YR5/4) chert. Bifacial percussion thinning flake scars cover both surfaces. The nature of the original blank is unclear. There is no evidence of heat-treatment or burning and a small patch of alluvial cortex is present on one surface. Pressure retouch is not present and blade margins do not show evidence of use. It possesses two transverse fractures that appear to have occurred during manufacture. It appears this biface fragment represents a dart point manufacture failure. No linear measurements were taken owing to its fragmentary condition, however it weighs 5.7 grams. No assignment of age or cultural affiliation is possible.

Initial Stage Bifaces

Specimen 8. (Figure 30-C). A small alluvial cobble exhibiting initial bifacial percussion flaking was recovered from Unit 4, Level 6, 50-60 cmbs during Phase II testing at 41HR1114. It is made of fine-grained moderate yellowish-brown (10YR5/4) to dark yellowish-brown (10YR4/2) silicified wood. Patches of alluvial cortex remain on one surface. The biface has a thickened cross-section and it has been transversely fractured during reduction. There is no thermal alteration or burning. Bifacial percussion flake scars almost completely cover both surfaces, however there is no evidence of systematic attempts to reduce biface thickness. No pressure retouch is evident and there is no macroscopic indication of use. While it is possible that the biface could have been used in some manner, it appears that it was abandoned during initial shaping attempts due to manufacture error. No measurement of length could be taken owing to breakage, however the specimen measures 31.6 mm in width and 21.0 mm in thickness. It weighs 38.3 grams. No assignment of age or cultural affiliation is possible.

Specimen 46. (Figure 30-D). This small alluvial pebble exhibits rough, initial stage bifacial edge trimming. It was recovered from Unit 13, Level 6, 60-70 cmbs during Phase III data recovery at 41HR1114. It is made of fine-grained moderate yellowish-brown (10YR5/4) chert. Alluvial cortex covers the majority of the biface. This artifact has a thickened cross-section and it is intact. There is no thermal alteration or burning. Bifacial percussion flake scars are limited to pebble margins and there is no evidence of systematic attempts to reduce pebble thickness. Rather, it appears that limited edge trimming was performed in anticipation of further pebble reduction. The sizes of the flake scars make it unlikely that the pebble's primary purpose was flake blank production. No pressure retouch is evident and there is no macroscopic indication of use. While it is possible that the biface could have been used in some manner, it appears that it was abandoned during initial edging attempts owing to step fracturing and overall inability to thin. The specimen measures 37.8 mm in length, 27.6 mm in width and 17.4 mm in thickness. It weighs 20.3 grams. No assignment of age or cultural affiliation is possible.

Initial, Primary and Secondary Stage Biface Fragments

Specimen 4. (not illustrated). A small amorphous primary stage biface fragment made from fine-grained, burned reddish-pale brown to yellowish-brown (exterior 10R3/4, interior 10YR6/2) chert was recovered from Unit 3, Level 7, 60-70 cmbs during Phase II testing. Percussion flake removal scars are present on both surfaces, however a pot lid fracture on one fractured surface indicates exposure to extreme heat and burning. The original form is not apparent, no evidence of use is present and no linear measurements were taken owing to breakage. It weighs 1.0 grams. Its age and cultural affiliation are unknown.

Specimen 9. (not illustrated). This initial stage biface is rectlilinear in overall form and has an irregular cross-section. It was recovered from Unit 5, Level 6, 60-70 cmbs during Phase III data recovery efforts. The biface fragment is made of unheated dark yellowish brown (10YR4/2) chert. It appears that the original blank is a thick flake and there is no residual cortex. No burning was noted. Initial flaking has resulted in irregular flaking on opposing surfaces and no systematic efforts to thin were noted. There is some macroscopic evidence of use present along one lateral margin. This specimen may represent a very early stage of reduction of a biface that was intended to be a small dart point. The reason for abandonment is not clear but it may have subsequently been used as a tool. The following measurements were taken: length 37.5mm; maximum width 26.2 mm; and thickness 10.0 mm. It weighs 10.9 grams. Its age and cultural affiliation are unknown.

Specimen 17. (Figure 30-H). This proximal-medial portion of a secondary stage biface is finished and it has been transversely fractured, apparently during use. It was recovered from Unit 9, Level 5, 50-60 cmbs at 41HR1114 during Phase III data recovery efforts. It appears to be made of coarse-grained dark yellowish brown (10YR4/2) to moderate yellowish brown (10YR5/4) chert. Well-executed bifacial percussion flake scars are present on both surfaces with secondary pressure retouch present, especially along the convex basal margin. This has resulted in a well-thinned and symmetric biface that exhibits very good workmanship. There is no evidence of heat-treatment or burning and the cross-section is biconvex. The transverse fracture indicates that it snapped during use. This biface fragment may represent a portion of a hafted bifacial knife since heavy grinding or edge abrasion was noted along the proximal portion of the biface. There was no macroscopic evidence of use noted but a large portion of the blade is not present making assessment of use difficult. There is a chance that this specimen could have functioned as a hafted dart point although it does not conform to an established type if that is the case. The following measurements were obtained: length indeterminate, maximum width 26.3 mm, thickness 9.2 mm. It weighs 13.2 grams. No assignment of age or cultural affiliation is possible.

Specimen 29. (not illustrated). A small amorphous secondary stage biface fragment made from fine-grained, burned olive gray (5Y4/1) to dark yellowish-brown (10YR4/2) chert was recovered from Unit 11, Level 6, 60-70 cmbs during Phase III data recovery. No cortex is present. Very little can be discerned regarding flaking in this specimen owing to its fragmentary condition. It appears to have been fractured by heat.

The original form is not apparent, no evidence of use is present and no linear measurements were taken owing to breakage. It weighs 0.3 gram. Its age and cultural affiliation are unknown.

Specimen 51. (not illustrated). A thick initial stage biface fragment was recovered from Unit 14, Level 7, 70-80 cmbs at 41HR1114 during Phase III data recovery efforts. It is made of moderate yellowish-brown (10YR5/4) chert. Bifacial percussion flake scars are present on both surfaces. The nature of the original blank is unclear although a small amount of alluvial cortex is present along one margin. There is no evidence of heat-treatment or burning. Pressure retouch is not present and the biface was snapped during manufacture. This biface fragment may represent a dart point manufacture failure. No linear measurements were taken owing to its fragmentary condition, however it weighs 7.6 grams. No assignment of age or cultural affiliation is possible.

Specimen 53. (Figure 30-F). A broken primary stage biface fragment made from a flat alluvial cobble was recovered from Unit 15, Level 5, 50-60 cmbs at 41HR1114 during Phase III data recovery efforts. It is made of moderate yellowish-brown (10YR5/4) to dark yellowish brown (10YR4/2) chert. Bifacial percussion flake scars are present on both surfaces and one margin appears to have some platform preparation in the form of edge abrasion. Small amounts of alluvial cortex are present on opposing surfaces. There is no evidence of heat-treatment or burning. Pressure retouch is not present and the biface possesses a transverse fracture indicating that it snapped during manufacture. This biface fragment may represent a dart point manufacture failure, however the ultimate intentionality of the knapper is unknown. There is no macroscopic evidence of use. The length is indeterminate, however it is estimated to be 37.8 mm in width and 11.8 mm in thickness. It weighs 21.8 grams. No assignment of age or cultural affiliation is possible.

Specimen 56. (Figure 30-G). This secondary stage biface fragment appears to be finished and it has been transversely fractured, apparently during use. It was recovered from Unit 15, Level 6, 60-70 cmbs at 41HR1114 during Phase III data recovery efforts. It is made of fine-grained dark brownish-black (5YR2/1) chert. Well-executed bifacial percussion flake scars are present on both surfaces with secondary retouch present. There is no evidence of heat-treatment or burning and the cross-section is biconvex. Some pressure retouch is present and the biface possesses a transverse fracture indicating that it snapped during use. This biface fragment may represent a portion of a bifacial knife. There is also a chance that it is a late stage bifacial preform that was broken during the latter stage of manufacture. There is no macroscopic evidence of use. No measurements were taken owing to its fragmentary nature. It weighs 10.5 grams. No assignment of age or cultural affiliation is possible.

Specimen 62. (not illustrated). A thick, narrow finished biface fragment with a triangular cross-section was recovered from Unit 10, Level 6, 60-70 cmbs during Phase III data recovery efforts. The biface fragment is made of unheated brownish gray (5YR4/1) to medium light gray (N6/) chert with occasional small white (N9/) fossiliferous inclusions. The nature of the original blank is unclear and there is no residual cortex. No burning was noted. The biface has a transverse snap fracture that probably occurred during use. No macroscopic evidence of use was noted along lateral margins. The overall form of the implement is unclear, it may have been a thick drill, pick or similar perforating tool. No linear measurements were taken owing to its fragmentary condition. It weighs 9.0 grams. Its age and cultural affiliation are unknown.

Tested Cobble/Cobble Chopper

Specimen 61. (Figure 29-E). An intact tested cobble/cobble chopper was recovered from Unit 16, Level 7, 70-80 cmbs during Phase III mitigation efforts. The artifact is made of fine-grained dark yellowish-brown chert (10YR4/2). Alluvial cortex covers most of the small cobble, however repeated percussion blows along one margin have produced a rough, sinuous bifacial margin with opposing platforms. Numerous step fracture terminations related to manufacture are present and flake removals are very short. It is possible that the bifacial edge was used in chopping tasks but no obvious macroscopic evidence of use was noted. The flaking appears too regular to represent testing of the raw material and the flakes that were removed seem too small for practical use. No evidence of intentional thermal alteration or burning was noted. The specimen measures 57.1 mm in length, 46.0 mm in width, and 34.0 mm in thickness. It weighs 91.3 grams. No assignment of age or cultural affiliation is possible.

Core

Specimen 16. (Figure 29-D). An intact unprepared, expedient core made from an alluvial pebble was recovered from Unit 9, Level 5, 50-60 cmbs during Phase III mitigation efforts. The artifact is made of fine-grained dark yellowish brown (10YR4/2) chert. Moderate yellowish brown (10YR5/4) alluvial cortex covers the unflaked portions of the core. Small, white (N9/) fossiliferous inclusions are present throughout the chert matrix. No evidence of platform preparation or standardized core preparation is present. Multiple percussion flake scars are present that originate from at least two cortical platforms which travel virtually the entire length of the pebble. No evidence of thermal alteration or burning was noted. It appears that flakes were removed for further use as no attempt to thin the pebble is present. The specimen measures 38.1 mm in length, 28.4 mm in width, and 24.1 mm in thickness. It weighs 33.0 grams. No assignment of age or cultural affiliation is possible.

Retouched Flake/Arrow Point

Specimen 48. (Figure 30-I). A largely intact bifacial edge-retouched flake/arrowpoint was recovered from Unit 14, Level 6, 60-70 cmbs during Phase III data recovery. The specimen is made of moderate brown (5YR3/4) translucent chert. There is no evidence of heat treatment or burning and the cross-section is flattened. This artifact is made on a relatively thin flake and exhibits combinations of unifacial and bifacial edge retouch, especially along the distal margin which is thicker than the remainder of the artifact. It appears that two notches have been produced along the flake margins by pressure flaking which resulted in barb-like shoulders, one of which is fractured. A possible stem is present including a tip, however the thickness of the tip relative to the possible haft area is not typical for arrow points. The remnants of a possible impact fracture is present on one face just proximal of the tip, however bifacial pressure retouch has obliterated the original area of impact. In summary the flake appears to be finished and possibly used in some manner, perhaps as a hafted arrow point but its overall method of manufacture is atypical. No measurements were obtained owing to breakage except for a thickness of 4.8 mm and possible juncture width of 10.7 mm. It weighs 2.1 grams. No assignment of age or cultural affiliation is possible.

Utilized Flakes

Specimens 18, 23, 45, 52, 55, 57, and 58 (not illustrated) were classified as utilized flakes during the analysis. Utilized flakes or use-modified flakes consist of flakes or spalls that exhibit clear macroscopic edge-modification indicating use as a tool. Flake removal is usually considered unintentional but the possibility that some minor intentional retouch may be present in the utilized flake category cannot be ruled out. The presence of continuous, regular, small flake scar removals confined to the flake margin, or continuous scarring, nicking, or severe edge abrasion/rounding/smoothing of the flake margin were considered to be indicators of flake use (if not attributable to modern fracture, i.e., shovel/trowel impacts, bag/handling retouch, etc.). It is likely that other flakes were used, but were not recognized as such at the macroscopic level. The degree of use intensity and/or the nature of the material being worked are major factors which determine whether use wear is visible at the macroscopic level (Ahler 1979; Odell 1981). These artifacts are sometimes referred to in the literature as informal flake tools since the underlying assumption is they were quickly produced and used with little effort and time or energy expended in their manufacture (Parry and Kelly 1987).

Lithic Summary

A moderate size sample of stone tools and lithic debris was recovered during the Phase I, Phase II, and Phase III investigations at site 41HR1114. The material was recovered from the shovel tests, trenches, and excavation units (Tables 22 and 23, Appendix IV). A total of 62 flaked stone tools are present in the sample of which 55 are formal tools/implements and eight are informal flaked stone tools. About 85 percent of the tools were made on Edwards-related pebble/cobble chert while about 15 percent are of silicified wood. Ninety-two percent of the tools/implements show no evidence of intentional thermal alteration while three percent appear to have been heated. Five percent are indeterminate with regard to heat. Flakes or debitage number 3,696 and an additional 21 pieces of percussion shatter, eight pieces of thermal shatter, and two pieces of natural rock were recovered. Approximately 13 percent of the flake debris appears to have been heated while 86 percent is unheated. One percent is indeterminate with regard to heat. The following discussion, in addition to providing distributional data, provides a general cultural and chronological framework and discusses aspects of lithic technology employed by site inhabitants. Artifact variability and the range of stone working activities that likely occurred on-site are also discussed.

Stone Artifact Distribution

Figure 31 graphs the horizontal distribution of all formal tools and debitage from the combined excavation units. Examination of Figure 31 indicates that flake debris density is fairly evenly distributed among Units 3-15 but drops off considerably in Units 1 and 2 and to a lesser extent in Unit 16. In contrast, formal tools are concentrated in Unit 11 and to a lesser extent in Units 10 and 12. Other minor peaks in formal stone tool occurrence are evident in Unit 3 and Units 14-15. Stone tools are also present in low numbers in other units except for Units 1-2. The distribution of raw material is fairly equitable across the units although there is a slightly higher percentage of silicified wood present in Units 3, 4 and 9. It should be noted that Kent points were concentrated in Unit 11 while Gary points were concentrated in Unit 12. Other point types were too infrequent to suggest a concentration or pattern.

Looking at the vertical distribution of flake debris from the combined excavation units it can be seen in Figure 32 there is a precipitous increase in flake debris in Level 3. Flake density reaches a peak in Level 4 before dropping slightly in Levels 5 and 6 and steadily declining in Levels 7-10. The vertical distribution of formal stone tools exhibit a slightly different pattern than seen for the flake debris (Figure 32). It may be seen that formal tools begin to increase in Level 4 and peak in Level 6 before quickly declining in Levels 7-8. The vertical distribution of raw materials was similar with only a slight increase in the percentage of silicified wood flake debris in Levels 6 and 9.

Chronology

The excavation units produced numerous diagnostic dart point forms that date to the Middle-Late Archaic periods in Southeast Texas. Diagnostic projectile point/knife types recovered from the site include Kent (47 percent), Gary (21 percent), Bulverde (8 percent), Ellis-like (8 percent), Ensor (4 percent), Godley-like (4 percent), Palmillas (4 percent), and Yarbrough (4 percent) (Figure 33). These forms date primarily to the Middle to Late Archaic periods in Southeast Texas (2500 B.C. to 100 B.C.) although Gary, Ensor, and Godley points tend to date later to the Transitional Archaic-Early Ceramic period from approximately 250 B.C. to A.D. 750-800 (Ensor 1990; Ensor and White 1998; Turner and Hester 1993; Story 1990). Ellis-like and Yarbrough points are difficult to define typologically so their limited occurrence at site 41HR1114 does not allow an independent assessment of their chronological position other than to note their co-occurrence with Kent and Bulverde points. Likewise, the single occurrence of Palmillas in the same level as numerous Gary points does not allow for a meaningful assessment of its chronological position. Examination of the vertical distribution of the typable dart points across the site indicates that Kent points predominate in Levels 6 and 7 while Gary darts points dominate in Level 5 providing some support for the contention that Gary points primarily post-date Kent points in Southeast Texas although there may be some overlap. Bulverde points, which

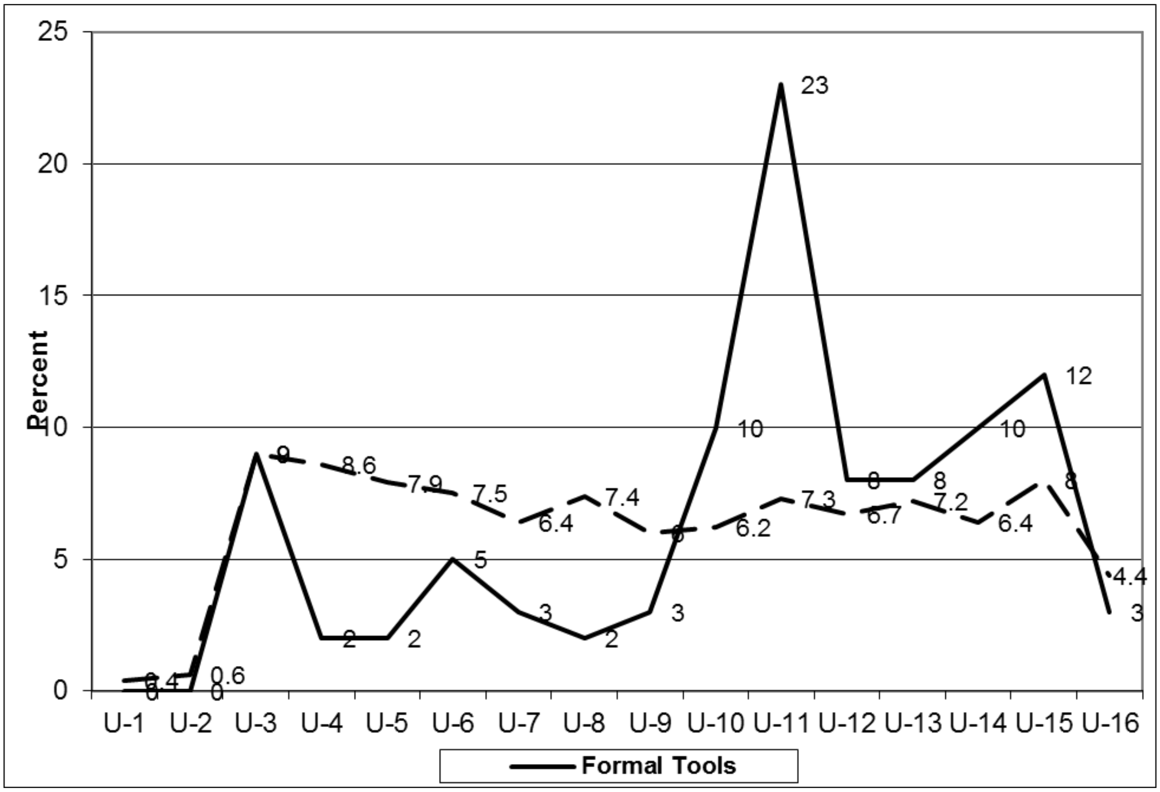


Figure 43. Horizontal distribution of lithic artifacts.

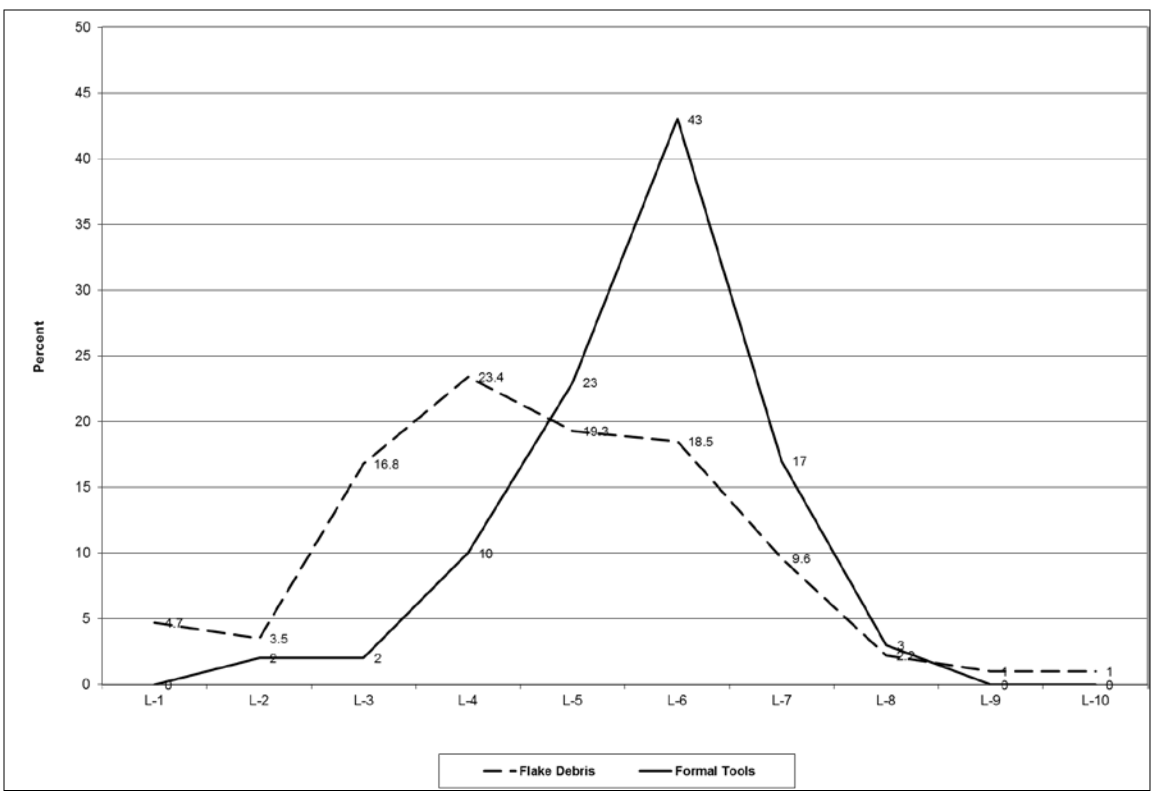


Figure 44. Vertical flake and tool distribution.

are believed to date to the late Middle Archaic, occur in Levels 6 and 8 and overlap with the Kent distribution. Owing to the small sample size of typable points other than Kent/Gary, the distribution of other forms does not allow any meaningful contribution regarding a refinement of the Middle to Late Archaic and Early Ceramic sequence.

Based strictly on the frequency of dart point types it may be that the majority of the flaking debris found at the site relates to Late Archaic-Early Ceramic period occupations since Kent and Gary points combined make up 68 percent of all typable points. However, the presence of other dart point forms suggests that the site was occupied intermittently by several other Middle-Late Archaic groups over an approximate 2500 year period. Furthermore, it appears that initial site occupation occurred after 2500-2000 B.C. based on the implied dart point chronology.

Lithic Technology

Stone Tools and Flake Debris

The percentage of all formal lithic tools/implements recovered during site investigations are graphed in Figure 34. It is observed that the formal flaked stone tools/implements consist of dart points/fragments (67 percent), initial bifaces (7 percent), primary bifaces (6 percent), secondary bifaces (7 percent) dart point preforms (7 percent), tested cobble/cores (4 percent), and other (2 percent). These data indicate low tool variability at the site since most of the variability in tool/implement forms appears related to dart point manufacture and use. The Middle-Late Archaic and Early Ceramic tool kit at the site seems dominated by the dart point which undoubtedly served as a multi-purpose tool for a long period of time.

Initial to primary biface production is evident at 41HR1114 in the form of aborted dart point preforms, and initial and primary stage bifaces which constitute 20 percent of the formal tools/implements. Evidence of late stage biface use is abundant in the form of secondary stage and biface/biface fragments and especially finished and reworked dart points/fragments which combined make up 74 percent of the formal tool inventory. Free-hand or amorphous core technology is not common at the site, represented by only a single specimen although an additional tested cobble/chopper was also found. Utilized flakes are not common at the site with only eight being found which is in accordance with the low number of cores present.

A total of 4,627 pieces of flake debris or debitage was recovered from the site along with 55 formal flaked stone tools/implements as mentioned above. This indicates a formal flaked stone tool to unmodified flake ratio of approximately 1:75. When this data is combined with a significant presence of dart point preforms and initial/primary stage bifaces at the site it seems that flaked stone biface/point manufacture was an important activity during Middle-Late Archaic and Early Ceramic periods. This appears to be especially true for the Late Archaic period since the majority of the initial and primary stage bifaces were found in Levels 5-7 where Kent points predominate.

The percentages of the various flake debris size/cortical categories indicate that overall 40 percent of unmodified flakes retain some cortex while 60 percent do not. Ninety-two percent of the flakes fall into the smallest or Size 4 (¼ inch) category, Size 3 (1/2 inch) flakes make up seven percent, while Size 2 (3/4 inch) and Size 1 (1 inch) flakes comprise less than one percent combined. Only six Size 1 (1-inch) flakes were recovered and five retain cortex. Size 2 (3/4 inch) flakes total only 27 specimens with 68 percent retaining cortex and 37 percent not retaining cortex.

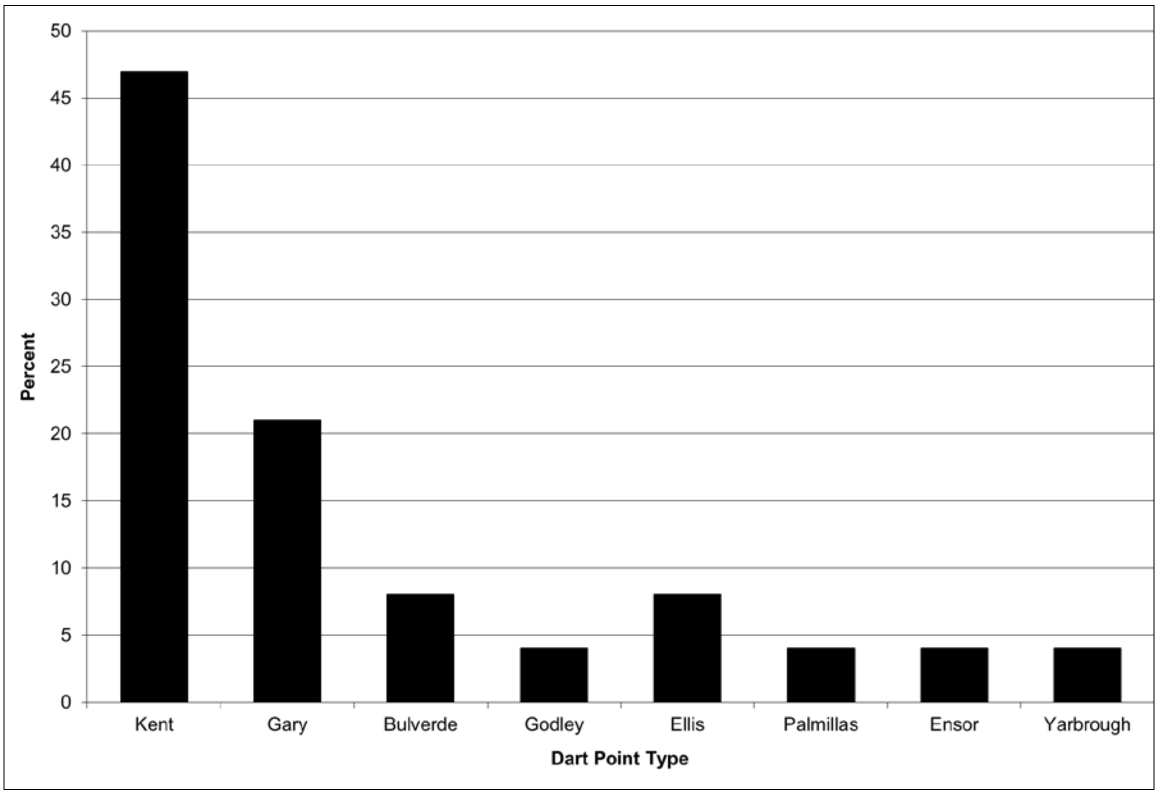


Figure 45. Percentage of dart point types at 41HR1114.

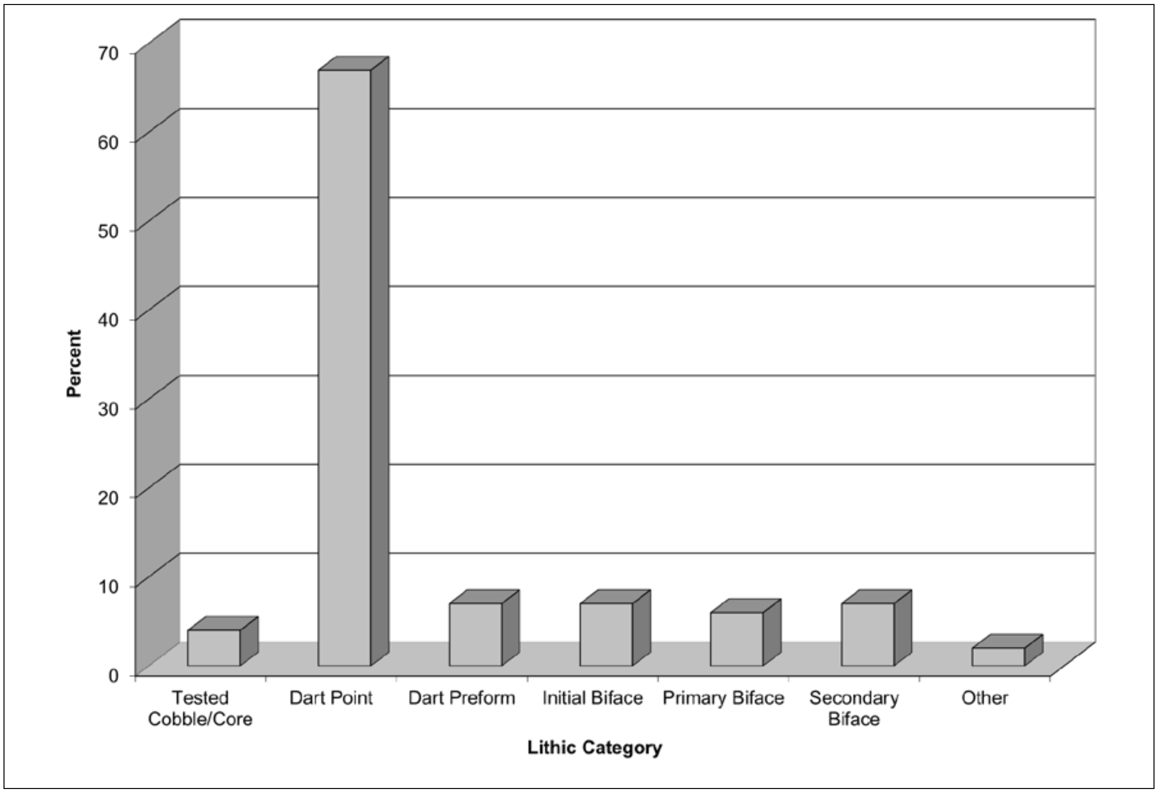


Figure 46. Percentage of lithic categories at 41HR1114.

Size 3 flakes (1/2 inch) number 308 and 66 percent retain cortex while 34 percent do not. Finally, of the Size 4 (¼ inch) flakes, 38 percent retain cortex while 62 percent do not. The fact that small flakes form the highest percentage by far is probably indicative of the small size of the pebbles/cobbles (4-6 cm) used as objective pieces. Further, the high percentage of Size 3 (1/2 inch) flakes that retain cortex is probably also related to the small size of the preferred lithic raw material. The predominance of small flakes is both an indicator of the small parent material utilized and dart point resharpening/rejuvenation activities that occurred at the site. The presence of numerous cortical flakes, and the presence of dart point preforms, initial and primary stage bifaces indicates that biface manufacture, in particular dart point manufacture, was an important site activity. As noted above the low incidence of flake utilization and low number of cores suggests that expedient tool use was minimal.

Summary

Overall the data suggests that there was an emphasis placed on formal tool manufacture and use at the site since dart points are the primary tool found. Dart points were produced, used, and maintained during periodic site visits by Middle-Late Archaic and Early Ceramic residents. Late Archaic occupation(s) may have been concentrated in the vicinity of Unit 11 since the majority of Kent points were found vertically clustered in this unit. Likewise, Early Ceramic occupation(s) may have been more frequent in the vicinity of Unit 12 since most Gary points were found in this unit. The fairly uniform distribution of flake debris across the site, along with the sporadic occurrence of formal tools suggest that intermittent, short term occupations occurred over a long time span during the Middle-Late Archaic and Early Ceramic periods. It seems likely that the Edwards-derived raw material including silicified wood was brought to the site primarily in unreduced form since the parent material used was small in size and could be transported with relative ease from a not-too-distant source. Since the overall quality of the lithic raw material is good to excellent it seems that thermal alteration was generally not necessary although it was used on occasion. The presence of certain varieties of Edwards chert and one unidentified chert suggests that long-distance movement or procurement of raw materials may have occurred on occasion. Dart point manufacture, use, and maintenance were common site activities and the initial and primary stage bifaces (in addition to dart point preforms) were discarded during dart point manufacture. Evidence of hunting is strongly suggested by the high number of intact and fragmentary dart points. Slightly more than half of the intact dart points retain evidence of impact fractures and use modification along blade edges is common. Overall, the lithic collection is moderate in size with a moderate density of flake debris and low diversity of tool forms. The dart points were likely used in a variety of cutting and other tasks associated with procurement of game. The few utilized flakes recovered along with the core and tested cobble/chopper were also used during the performance of daily subsistence-related tasks.

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CHAPTER 8
CERAMIC ANALYSIS

Eleanor Stoddart
and Erin Phillips

Introduction and Chronology

Prior to the 1950s, little work had been done on ceramic analyses of the Upper Texas Coast, which led to a poor understanding of the ceramic sequence of the area (Moore et al. 1994). Wheat (1953) was the first to try to define southeast Texas ceramics in his Addicks Reservoir survey. His study of the ceramic materials recovered during his late 1940s surveys and excavations noted that the pottery in the area consisted of “a highly variable ware divided into two subtypes, decoration serving as the primary criterion for the separation” (Wheat 1953:184). He named the two subtypes Goose Creek Plan and Goose Creek Incised. He found the pottery difficult to date, as examples were found in all stratigraphic levels and so stated they have “little value as time markers” (Wheat 1953:194). Lawrence Aten later used Wheat’s work as a basis for his survey of the Upper Texas Coast (1983) and Wheat’s definitional criteria (though in a narrower form) for ceramics are still used today. Later studies refined classifications to include various types of temper (sand, bone, grog) as well as different decorative techniques (Moore et al. 1994).

As mentioned previously in Chapter 4, Aten’s (1983) chronology has pottery appearing in the region around A.D. 100 to A.D. 800. This pottery includes the early varieties of sandy paste untempered Goose Creek types, as well as a group of loosely consolidated, contorted paste pottery, resembling the Tchefuncte types from the Lower Mississippi (Moore et al 1994). The Tchefuncte varieties disappear from the archeological record by about A.D. 425, though the Goose Creek varieties are still seen. The first evidence of tempered pottery appears during this time period, though only for a short temporal span (Aten 1983).

Goose Creek pottery dominates the time period from A.D. 425-1000, though new modifications of design motifs begin to appear on the Goose Creek Incised types at this time, and there is a resurgence in the archeological record of red-filmed varieties (Moore et al. 1994). Grog-tempered pottery also starts to appear during this time. From A.D. 1000-1350, Goose Creek types decline, and grog-tempered pottery increases drastically in frequency. By 1350 A.D, grog-tempered pottery reaches a peak and declines rapidly, allowing Goose Creek to dominate the archeological record again by 1700 A.D. This time period is also marked by the first appearance of bone-tempered pottery (Moore et al. 1994). Prehistoric aboriginal pottery continues to be found through the beginning of the nineteenth century, though through this time period all varieties except for Goose Creek Plain types decline.

Site 41HR1114 contains only Goose Creek Plain *var. Goose Creek* pottery.

Characteristics of Goose Creek Pottery

According to Aten (1983), Goose Creek Series pottery is characterized as having a poorly sorted sandy paste with maximum grain sizes ranging from very fine to medium grain sizes. The sandy inclusions are naturally occurring rather than intentionally added temper. Most examples of Goose Creek pottery have light-colored exteriors which grade to darker interior surfaces, and paste colors vary from black to orange and reddish hues, depending on firing conditions and sediment source. This ceramic type is pervasive on the upper Texas coast and extends southwest to Matagorda Bay and inland to Conroe-Livingston areas in the north.

We follow Weinstein (1991) in calling the standard variety of Goose Creek Plain pottery Goose Creek, *var. Goose Creek*, reserving Goose Creek Plain, *var. unspecified* for sherds or vessels that do not fit any of the defined varieties or for which the type, but not the variety can be determined. Goose Creek Plain, *var. Goose Creek* pottery follows the description for the Goose Creek series and lacks decoration such as incising, stamping, cord-marking, or red filming seen in other Goose Creek types.

Goose Creek Red-Filmed, *var. unspecified* pottery is identical to Goose Creek Plain pottery except for the addition of "a finely powdered red mineral pigment applied to the exterior (and occasionally to the interior) vessel surface," (Aten 1983) which can easily be worn or washed off the sherd. This film is different than the red surfaces that appear on highly oxidized sherds, and can be seen by checking whether "the red color grades into the brown or black of the interior of the sherd, or whether the film has a defined surface zone about 0.1 mm thick with no color continuity or gradation into the interior" (Aten 1983:236). While some specimens of Goose Creek Red-Filmed have been found in sites across Texas that have been incised, none from 41HR1114 show any evidence of this treatment. Goose Creek Red Filmed pottery is found in areas surrounding both Sabine Lake and Galveston Bay, in varying proportions, throughout the chronological sequences (Aten 1983). Some have been found in the Addicks Reservoir area (Wheat 1953), and the Conroe-Livingston area, though not in the Brazos Delta-West Bay area (Aten 1983).

Ceramics from 41HR1114

A total of 57 pieces of prehistoric Native American pottery was recovered from the site, along with five pieces of unidentified fired clay (Tables 24 and 25). All 57 pieces of the Native American pottery appear to be the sandy paste plainware described as Goose Creek (Aten 1983). There is no evidence of temper being intentionally added; instead, the clay used appears to naturally contain grains of sand. Rice (1987:409) describes this type of clay as "behaviorally, this is "untempered" clay, but technically and functionally, the inclusions modify its properties."

Table 24. Native American pottery found at 41HR1114.

Lot-spec	Unit	Level	Count	Weight (g)	Type	Refit	Burned	Comments
12-1	5	12	1	2.08	Goose Creek Plain			
16-12	6	4	3	3.6 2.9 5.9	Goose Creek Plain		x	
16-13	6	4	2	1.5 1.3	Goose Creek Plain			
16-9	6	4	2	1.5 3.8	Goose Creek Plain			oxidized; organics incompletely eliminated; sherd has black core
6-8	6	4	2	2.1 11.7	Goose Creek Plain			oxidized
16-6	6	4	2	5.9 5.6	Goose Creek Plain			organics incompletely eliminated; sherd has black core
17-5	6	5	2	1.9 2.7	Goose Creek Plain		x	
18-4	6	6	1	2.6	Goose Creek Plain			
18-5	6	6	2	2.7 1.5	Goose Creek Plain	x		
19-2	6	7	2	1.6 5.6	Goose Creek Plain	x		oxidized; organics incompletely eliminated; sherd has black core
23-2	7	3	2	2.8 1	Goose Creek Plain			organics incompletely eliminated; sherd has black core
23-1	7	3	1	1.6	Goose Creek Plain			
25-3	7	5	1	8.4	Goose Creek Plain			
30-2	8	3	3	7.1 2.2 2.2	Goose Creek Plain	x		possible rim sherd with mending hole; oxidized
30-1	8	3	1	4.8	Goose Creek Plain			organics incompletely eliminated; sherd has black core; oxidized

Lot-spec	Unit	Level	Count	Weight (g)	Type	Refit	Burned	Comments
32-2	8	5	2	1.6 1.8	Goose Creek Plain	x		organics incompletely eliminated; sherd has black core
38-1	9	4	1	1.2	Goose Creek Plain			
39-3	9	5	1	0.4	Goose Creek Plain		x	
44-1	10	3	1	8.3	Goose Creek Plain		x	organics incompletely eliminated; sherd has black core
45-1	10	4	1	3.5	Goose Creek Plain			organics incompletely eliminated; sherd has black core, oxidized
46-3	10	5	1	1.2	Goose Creek Plain		x	
46-4	10	5	2	5.5 5.6	Goose Creek Plain	x		oxidized
52-3	11	4	1	1.5	Goose Creek Plain		x	
52-4	11	4	2	1.2 7.3	Goose Creek Plain			organics incompletely eliminated; sherd has black core
53-5	11	5	1	15.5	Goose Creek Plain		x	
53-3	11	5	2	1.9 1.2	Goose Creek Plain	x	x	oxidized
53-4	11	5	1	2.7	Goose Creek Plain		x	oxidized
59-1	11	13	1	7.2	Goose Creek Plain			heavily weathered-interor and exterior surfaces
63-1	12	3	1	0.6	Goose Creek Plain		x	
66-1	12	6	1	0.2	Goose Creek Plain			organics incompletely eliminated; sherd has black core
66-2	12	6	1	3.8	Goose Creek Plain			oxidized
66-3	12	6	1	0.7	Goose Creek Plain			organics incompletely eliminated; sherd has black core, oxidized

Lot-spec	Unit	Level	Count	Weight (g)	Type	Refit	Burned	Comments
68-1	12	7	2	2.7 2.2	Goose Creek Plain	x		organics incompletely eliminated; sherd has black core
73-1	13	4	1	5.8	Goose Creek Plain		x	
80-1	14	4	1	12.3	Goose Creek Plain			charring on interior
83-5	14	7	1	0.9	Goose Creek Plain		x	
83-6	14	7	3	1 0.9 0.3	Goose Creek Plain			organics incompletely eliminated; sherd has black core
88-1	15	4	1	2.1	Goose Creek Plain			oxidized

Three pieces of fired clay, together weighing 1.6g were recovered from a single context (XU 6, Level 5). These are not included in the totals of pottery recovered from the site.

One variety of Goose Creek has been identified from 41HR1114: Goose Creek Plain, *var. Goose Creek*. No evidence of stamping, incising, cord-marking or other decoration appears on any pottery recovered from 41HR1114. Because the total sherd count was so low (n=57), each sherd was examined. All sherds were examined using a binocular microscope and when a fresh break was not present, a small piece of the sherd was broken off so a fresh break could be examined. No sherds showed any kind of temper other than the naturally occurring unsorted sand and all sherds that appeared to potentially red filmed were determined to be oxidized instead.

Table 25. Refitted ceramics, by level and excavation unit.

Unit	Level	Count	Pieces can be refit	Comments
6	7	2	x	Two body sherds, organics incompletely eliminated; sherds have black cores, red wash
8	3	3	x	One possible rim sherd with mending hole and traces of red wash (worn away?), red wash on two lower sherds
8	5	2	x	Two body sherds, organics incompletely eliminated; sherds have black core, red wash
10	5	2	x	Two body sherds, red wash on exterior
11	5	2	x	Two body sherds, red wash
12	7	2	x	Two body sherds organics incompletely eliminated; sherds have black cores

A number of sherds were refitted (Table 25). A total of thirteen sherds found within five specific excavation units were refitted into parts of six separate vessels. Unfortunately, the refitting did not add a great deal of information as to vessel type, or size, as the sherds, even when refitted were either too small or were made up of undistinguishable body sherds.

One sherd showed evidence of a possible mending hole (Figure 47). It was one of two sherds identified as a rim sherd. It was heavily eroded and was refitted with two additional sherds from the same excavation unit and level (XU8, Level 3). The oxidized red outer surface was noted on the lower two sherds and was partially worn away nearer the rim and mending hole.

Figure 47. Goose Creek Plain, *var. Goose Creek* sherds, with possible mending hole near rim. (XU8, Level 3).

While examining the sherds, it was discovered that 23 (42%) contained a darker colored core, surrounded by lighter bands of clay on the interior or exterior surfaces. The darker color differed from the appearance of burned sherds, which were dark throughout the interior, as well as on the surface (Table 26). This appearance results from organic materials in the clay being incompletely removed during the firing process. The conditions of firing, including duration, temperature and atmosphere were insufficient to oxidize and burn out the carbon contained within the clay (Rice 1987). As the Upper Texas Coast is humid and kilns were not utilized, it is unsurprising that open air firing temperatures and times would have been difficult to control.

Table 26. List of pottery with organics incompletely eliminated during firing from site 41HR1114.

Unit	Level	Count	Burned	Comments
6	4	2		organics incompletely eliminated; sherd has black core
6	6	3		organics incompletely eliminated; sherd has black core
6	7	2		organics incompletely eliminated; sherd has black core, red wash
7	3	2		organics incompletely eliminated; sherd has black core
8	3	1		organics incompletely eliminated; sherd has black core, red wash
8	5	2		organics incompletely eliminated; sherd has black core, red wash
10	3	1	x	organics incompletely eliminated; sherd has black core
10	4	1		organics incompletely eliminated; sherd has black core, red wash on interior and exterior
11	4	2		organics incompletely eliminated; sherd has black core
12	6	1		organics incompletely eliminated; sherd has black core
12	6	1		organics incompletely eliminated; sherd has black core
12	7	2		organics incompletely eliminated; sherd has black core
14	7	3		organics incompletely eliminated; sherd has black core

A number of sherds (16, or 29%) show traces of having been burned (Table 27). This could either have been a result of a charring incident while cooking, or the vessel cracking and shattering while being used in a fire. The evidence of burning differs from the appearance of incompletely eliminated organics within the clay, as burning is characterized as the deposition of a blackened surface. This is characterized by a blackened color at or near the surface of a sherd which is contrasted with its lighter colored core (Ellis 1994).

A single sherd showed evidence of both burning and of having the organics within the clay incompletely burn away during firing (XU 10, Level 3).

Table 27. List of burned pottery from site 41HR1114.

Unit	Level	Count	Burned	Comments
6	4	3	x	
6	5	2	x	
9	5	1	x	
10	3	1	x	Evidence of organics being incompletely eliminated, sherd has a black core
10	5	1	x	
11	4	1	x	
11	5	1	x	
11	5	2	x	
11	5	1	x	
12	3	1	x	
13	4	1	x	
14	4	1	x	charring on interior
14	7	1	x	

Regional Context

An archeological survey of the Addicks Dam Basin was begun in 1947 as part of the River Basin Surveys carried out during the Inter-Agency Salvage Program (Wheat 1953). A total of 7,000 artifacts were recovered from nine Addicks Dam Basin sites, of which 5,000 were potsherds. In his report, Wheat (1953) describes the amounts of Goose Creek pottery that were found at four specific sites; however, it is difficult to directly compare specific totals as his excavations and the ones at 41HR1114 units were carried out differently. Some differences include:

1. Wheat's excavation units were dug in 15 cm levels, while the majority of Site 41HR1114 was excavated in 10 cm levels.
2. When Level 1 at 41HR1114 was excavated, it included the top 20 cm of soil because of variances in ground surface, though all later levels conformed to 10 cm levels.
3. For two of the sites (Kobs and Doering), Wheat used pottery totals gleaned from excavations of five contiguous meter squares at each site, while at site 42/66A6-4 the totals resulting from only one square meter excavation unit was used. The single Grisbee site shovel test included measured 1.20 m square. At 41HR1114, excavation units measured one meter square, and 16 in total were excavated.

However, some rough comparisons can still be made. Examination of the data shows that pottery amounts from three of the sites (Kobs, Grisbee, and 42/66A6-4) increased uniformly in frequency from the lowest level, reached a maximum at about 30-65 cmbs, then declined before the site was abandoned. A fourth, the Doering Site, had a different distribution, with considerably less pottery found at lower levels (only nine sherds recovered below 60-75 cmbs) than the other three sites (Wheat 1953).

In contrast, excavations at site 41HR1114 show the majority of pottery is concentrated in the upper levels (20-70 cmbs) with only a single pottery sherd found below 70 cmbs (Figure 47; Lot 30, Specimen 2). In this way, pottery concentrations from 41HR1114 are similar to those at the Doering site, where the majority of pottery was found in the upper and middle excavation levels, rather than the Addicks Kobs, Grisbee and 42/66A6-4 sites, where pottery was found concentrated in the middle excavation levels and evenly distributed in the upper and lower excavation levels (Wheat 1953).

Wheat (1953) also mentions the scarcity of Goose Creek Incised pottery at the four Addicks-area sites, as only 11 sherds were recovered in his excavations. This may help to explain why none was found at 41HR1114. Wheat also very briefly mention "a few sherds" show remnants of a dark red wash or film applied on both the interior and exterior, though he does not list total numbers (Wheat 1953).

A final major difference between artifacts found during Wheat's Addicks surveys and the artifacts found at 41HR1114 is that Wheat noted pottery outnumbered lithics in all his sites. The opposite is true for 41HR1114, where lithics (N=608) drastically outnumber pottery (N=57).

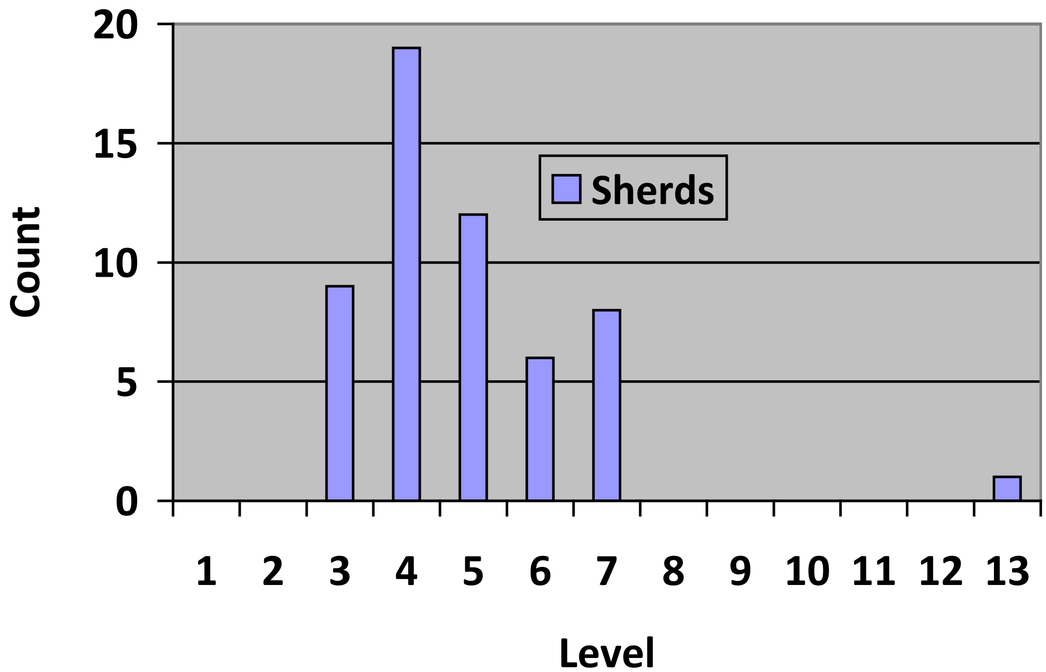

Figure 48. Number of pottery sherds from 41HR1114 by level and type.

CHAPTER 9
FAUNAL REMAINS

Eleanor Stoddart

A total of 16 pieces of non-human bone was recovered from the site (Table 28). Each piece was weighed, measured and an attempt was made to identify species. However, the bone was in such fragmentary condition it was impossible to conclusively identify any specific taxa. Instead, the closest identification was based on size. None of the bone fragments showed signs of butchering, incising, or tool use, and none showed any evidence of burning. No bone fragments could be refitted.

Table 28. Bone from 41HR1114.

Unit	Level (cmbs)	Artifact type	Length (mm)	Width (mm)	Weight (g)	Comments
11	2 (20-30)	Bone	34.20	14.17	1.60	Possible long bone?
11	2 (20-30)	Bone	24.90	6.51	0.60	
11	2 (20-30)	Bone	19.37	11.04	0.90	
11	2 (20-30)	Bone	15.39	10.21	0.40	
11	2 (20-30)	Bone	14.73	10.57	0.10	
11	2 (20-30)	Bone	19.86	8.60	0.10	
11	2 (20-30)	Bone	13.63	11.7	0.10	
12	2 (20-30)	Bone	43.13	21.72	6.70	Long bone, medium mammal?
13	1 (0-20)	Bone	22.00	16.57	1.00	
13	1 (0-20)	Bone	25.26	20.21	2.30	
13	1 (0-20)	Bone	20.51	12.97	1.00	
13	1 (0-20)	Bone	29.27	18.61	3.30	
13	2 (20-30)	Bone	12.67	11.89	0.40	
13	3 (30-40)	Bone	26.87	17.78	2.70	Long bone, medium mammal?
13	3 (30-40)	Bone	26.50	14.78	1.30	
13	6 (60-70	Bone	20.26	8.71	0.70	Long bone, small mammal?

Bone was found in three excavation units: 11, 12 and 13 (Table 29). The majority of bone was found in Excavation Units 11 and 13, with only a single fragment of bone recovered from Excavation Unit 12.

Table 29. Bone from 41HR1114 by Excavation Unit.

Excavation Unit	Number of bone fragments	Percentage (%)
11	7	44
12	1	6
13	8	50
Total	**16**	**100**

The majority of the bone came from upper levels of the site, with only a single fragment found lower than 40 cmbs (Figure 49). This contrasts with Wheats' Addicks surveys, where the majority of the bone from the Doering site was considered "plentiful" and the majority of bone was found below 45 cmbs, with the maximum concentration recovered at 75-105 cmbs (Wheat 1953:236). The Kobs site produced less bone refuse, with the majority of bone recovered from 15-75 cmbs (Wheat 1953:236). It is difficult to compare totals further, as Wheat only lists specific numbers of bone artifacts, and not totals for what he considers “bone refuse” (Wheat 1953:236).

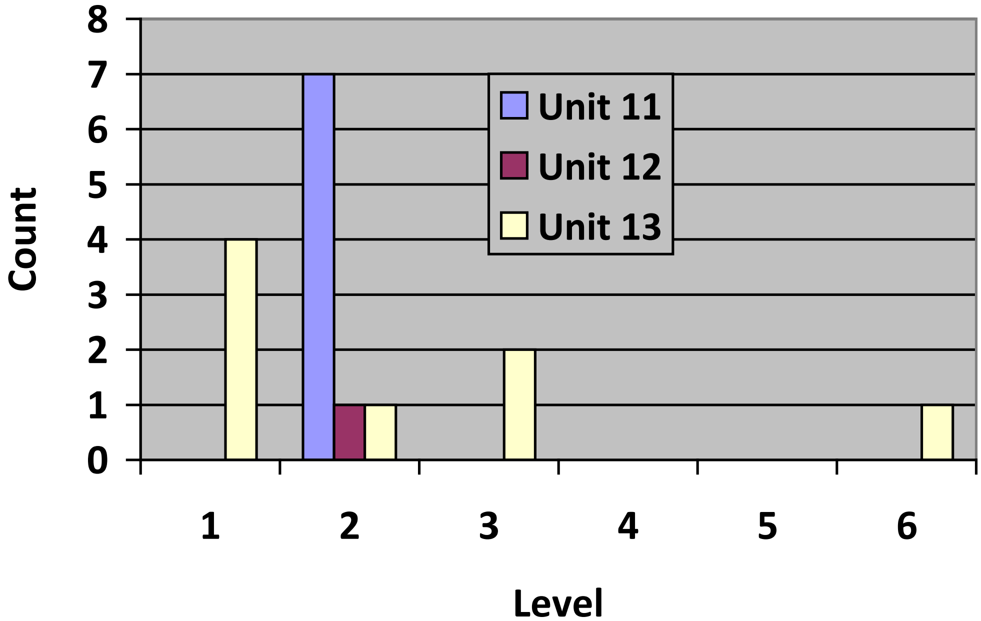

Figure 49. Bone from 41HR1114 by level.

CHAPTER 10
SUMMARY AND CONCLUSIONS

This report documents the National Register significance testing and data recovery investigations conducted over several weeks during February, March, and June of 2012 at the site of 41HR1114 by Moore Archeological Consulting, Inc. The site is located just west of Lower Mayde Creek, in west Harris County, Texas. The site had been first located during a February, 2012 survey conducted by Moore Archeological Consulting, Inc. in preparation for a proposed extension of the Park Row Boulevard Right-of-Way (Moore and Driver 2012). The survey alignment was privately owned at the time of the survey, and therefore, neither the Antiquities Code of Texas nor Section 106 of the National Historic Preservation Act of 1966 mandated the survey. However, the survey was carried out as proactive due diligence as a key element of the future regulatory requirements for a private development project on an ambitious development schedule. The survey identified three sites, 41HR1114, 41HR1115, and 41HR1116.

Significance testing excavations at 41HR1114 were conducted in late February and early March, 2012, and were also carried out as proactive due diligence. The test excavations consisted of hand excavation and backhoe trenching with a focus on geomorphological assessment of the site, including the depositional reconstruction and identification of the degree of intactness of the deposits. These investigations determined that the site possessed the potential for future research, and should be considered eligible for listing on the National Register of Historic Places (NRHP). At that point, the development project was subsumed within the Harris County Improvement District No. 4, DBA Energy Corridor Management District, and further investigations fell under the jurisdiction of the Texas Historic Commission (THC) permitting process. To facilitate planned development schedules, the proposed Park Row Boulevard Right-of-Way alignment was divided into smaller segments, with 41HR1114 located in the Phase 1 segment. This portion of the alignment measures approximately 850 m (2800 ft) in length, and the APE in the area of 41HR1114 is limited to a 36.5 m (120 ft) wide ROW (Figure 1). The data recovery investigations at 41HR1114 were conducted under Texas Antiquities Permit Number 6274.

During the significance testing and data recovery field investigations at 41HR1114, a total of sixteen 1 x 1 m hand units (XU 1-16) were excavated. XUs 1-4 were conducted as distinct 1 x 1 m units (XUs 1, 2, and 4 were placed adjacent to backhoe trenches) during the testing phase, while the remainder of the hand excavations were conducted as two 2 x 3 m block excavations (subdivided into XUs 5-10 and 11-16) as part of the data recovery phase. Three backhoe trenches (BHTs 1-3) totaling 45 m in length were excavated, two during the testing phase and one during the data recovery operations.

The excavations produced a total of 4431 artifacts. These materials were recovered from Levels 1-14 (0-150 cmbs), but with the highest concentrations of artifacts encountered in Levels 3-7 (87%, n=3,855; Figure 50). The recovered materials includes 39 whole and fragmented dart points, 11 bifaces and biface fragments, one retouched flake/arrow point, one tested cobble/chopper, one core, eight utilized flakes, 4295 pieces of lithic debitage, 55 Goose Creek pottery sherds, four fragments of burned clay, one fragment of ochre, and 16 fragments of faunal bone. Detailed analysis of all recovered lithic material was conducted by Blaine Ensor (Chapter 7), and suggested that the manufacture (including both primary and secondary reduction stages), use, and rejuvenation of formal tools was a major activity performed at the site throughout its occupation. The dominant formal tools present at the site consisted of various bifacial dart point types including *Bulverde*, *Ellis*, *Ensor*, *Gary*, *Godley*, *Kent*, *Palmillas*, and *Yarbrough*. In addition, the presence of certain varieties of Edwards chert and one unidentified chert suggests that long-distance movement or procurement of raw materials may have occurred on occasion. These chronologically diagnostic dart point types, in conjunction with the presence of ceramics and the lack of arrow points, indicate occupations at the site spanning the Middle Archaic to Early Ceramic periods.

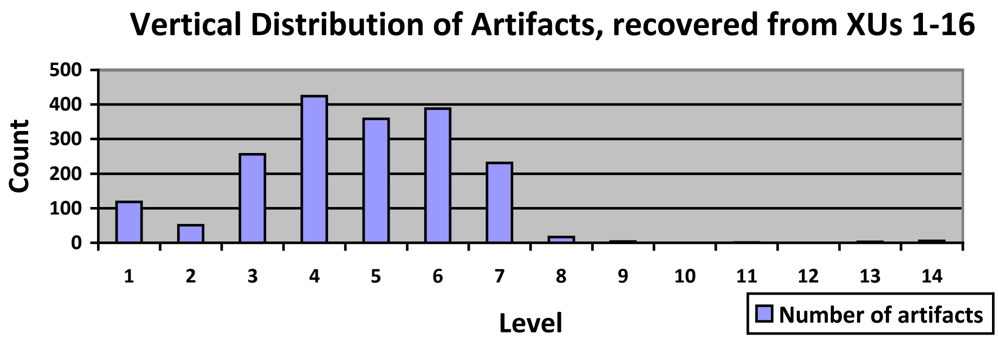

Figure 50. Vertical distribution of artifacts recovered from XUs 1-16, 41HR1114.

In terms of their vertical distribution, there appears to be considerable mixing of chronological types, with point types from the Middle Archaic, Late Archaic, and Early Ceramic often in the same levels (Table 30). Further, pottery was recovered from Levels 3-7, which also commonly contained points dating to the Middle and Late Archaic periods. This degree of vertical movement is consistent with the microartifact and OSL data discussed in the geoarchaeological assessment of the site deposits outlined in Chapter 3.

Conclusions

The results of Data Recovery excavations at Site 41HR1114 would be both disappointing and ambiguous without benefit of the geoarcheological analysis by Dr. Frederick, especially the important new information derived from his OSL dating and interpretation of the Depositional Units and the strata within them. The site exhibits a considerable degree of cultural stratigraphy in that the artifacts generally follow the pattern of younger materials at shallower depths and progressively older materials buried at greater depths. However, Dr. Frederick's depositional and dating analysis has revealed

Table 30. Vertical distribution of dart points by type.

Tool No.	Unit	Level	Lithic Category	Point Type
2	3	3	Dart Point	*Kent*
25	11	4	Dart Point	*Kent*
47	14	4	Dart Point	*Kent*
19	10	5	Dart Point	*Palmillas*
27	11	5	Dart Point	*Ensor*
38	12	5	Dart Point	*Gary*
39	12	5	Dart Point	*Gary*
40	12	5	Dart Point	*Gary*
41	12	5	Dart Point	*Gary*
11	6	6	Dart Preform/Frag.	*Kent*
15	8	6	Dart Point	*Godley-like*
21	10	6	Dart Point	*Kent*
31	11	6	Dart Point Frag.	*Ellis-like*
32	11	6	Dart Point	*Kent*
33	11	6	Dart Point Frag.	*Kent*
44	13	6	Dart Point	*Gary*
49	14	6	Dart Point	*Yarbrough*
60	16	6	Dart Point	*Bulverde*
22	10	7	Dart Point	*Kent*
34	11	7	Dart Point	*Ellis-like*
36	11	7	Dart Point	*Kent*
59	15	7	Dart Point	*Kent*
5	3	7	Dart Point	*Bulverde*
1	54	8	Dart Point	*Kent*

that this apparent cultural stratigraphy is merely the result of long-acting bioturbation processes within a comparatively ancient sandy deposit, an unfortunate state that characterizes many (but not all) sandy soil sites in Southeast Texas.

As Dr. Frederick concludes, "The majority of prehistoric cultural material was found in Stratum 4, the sandy upper part of a texture contrast soil formed in Depositional Unit 1 after this surface was abandoned by South Mayde Creek in the late Pleistocene, sometime after ~28,900 years ago. Single grain OSL dates indicate that with the exception of the very top of Stratum 4, the artifact assemblage is significantly younger than the matrix within which it resides, and that this suggests these artifacts have been dispersed into the soil by bioturbation rather than by alluvial sedimentation" as had been believed earlier.

Thus, the cultural data obtained by the Data Recovery excavations at 41HR1114 have proven upon intensive analysis to be to a considerable extent the typically ambiguous outcome of excavation within sandy soil sites in Southeast Texas. However, that does not mean that the Data Recovery excavations were without value in providing new information relevant to the prehistory of the region. The real, and quite significant contribution of this project has been through the intensive geoarcheological analysis of the Late Pleistocene and Early Holocene alluvium and of the nature and appearance of soil formation within such deposits at the site, and by extension for the Houston area. The current investigation has considerably diminished the paucity of information on the deposits lain down by small streams in the region. To quote Dr. Frederick again, "the work done at this site has advanced our understanding of the alluvial depositional record of such streams and the context of sites associated with deposits of different ages." Dr. Frederick combined LIDAR mapping data with single grain OSL dating and other excavation sampling to determine that two stratigraphic units are present at 41HR1114, Depositional Unit 1, a Late Pleistocene alluvial deposit of an ancient (~20,000-40,000 years BP) course of South Mayde Creek, and Depositional Unit 2, resulting from sedimentation within the last 200 years.

The other major contribution to an understanding of the geoarcheological context of sites in Southeast Texas is derived from Dr. Frederick's analysis of soil formation, specifically of argillic horizons within late Pleistocene and Holocene soils. This investigation added significant new information to the very small body of studies with absolute dating evidence for the relationship between argillic soil horizon formation and the depositional age of the alluvium within which these horizons have formed. The sum of Dr. Fredrick's analyses have revealed that the argillic horizon at 41HR1114 has formed in less than 20,000 years of pedogenisis.

We may conclude by reiterating that the Data Recovery excavations at 41HR1114 were successful in providing new information on the prehistory of the site and the broader Houston region. The contribution from the strictly archeological analysis of the cultural materials and contexts yielded by the site are modest. In contrast, the results of the intensive geoarcheological analysis of the site are quite novel and important, and have considerable broader application in the future analysis and evaluation of prehistoric sites within the Houston region. This investigation also reveals that additional investigations at portions of Site 41HR1114 existing outside the currently examined Park Row Boulevard extension should not be required since such investigations would yield geoarcheologically redundant results, and we now understand that the cultural materials recovered from the site have been subjected to considerable vertical dispersion due to bioturbation.

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APPENDIX I

Physical Properties of the Deposits

Column	Sample	Stratum	Depth (cm)	Sand (%)	Silt (%)	Clay (%)	USDA Texture Class	Mean (phi)	Median (phi)	Sorting (phi)	Skewness (phi)	Kurtosis (phi)	Magnetic Susceptibility ($10^{-8}m^3kg^{-1}$)	Loss-on Ignition (%)
XU 11	1	6b	2	51.6	38.4	10.0	Loam	4.25	3.91	2.02	0.37	1.09	2.9	3.8
	2	6b	5.5	52.8	31.7	15.5	Loam	4.52	3.82	2.39	0.50	1.01	2.8	2.0
	3	6a	8	52.6	32.6	14.8	Loam	4.48	3.83	2.35	0.48	1.02	2.9	1.6
	4	6a	10.5	50.4	32.2	17.4	Loam	4.69	3.96	2.51	0.48	0.98	3.0	1.4
	5	6a	13	51.6	30.7	17.7	Loam	4.66	3.88	2.55	0.50	0.96	3.5	1.3
	6	6a	15.5	50.7	31.3	18.0	Loam	4.71	3.94	2.52	0.49	0.94	5.6	1.3
	7	6a	18	46.0	32.7	21.3	Loam	4.93	4.30	2.61	0.39	0.79	3.7	1.5
	8	6a	20.5	51.9	29.9	18.2	Loam	4.67	3.85	2.57	0.50	0.92	4.0	1.3
	9	6a	22	49.1	32.4	18.5	Loam	4.77	4.05	2.53	0.46	0.90	3.5	1.3
	10	6a	23	49.4	32.2	18.4	Loam	4.69	4.03	2.58	0.41	0.87	4.3	1.3
	11	6a	25	45.5	35.9	18.6	Loam	4.88	4.28	2.54	0.40	0.94	3.2	1.4
	12	5	27	37.7	40.1	22.2	Loam	5.26	4.76	2.65	0.32	0.89	3.8	1.4
	13	5	29	52.7	29.7	17.6	Loam	4.64	3.81	2.52	0.52	0.94	3.2	1.0
	14	5	31	52.6	31.2	16.2	Loam	4.59	3.84	2.46	0.52	1.09	3.9	0.9
	15	4	33	59.8	26.6	13.6	Sandy Loam	4.20	3.45	2.29	0.58	1.20	2.7	0.7
	16	4	34	66.0	24.0	10.0	Sandy Loam	3.77	3.22	1.96	0.58	1.44	6.3	0.4
	17	4	37	62.5	26.1	11.4	Sandy Loam	3.98	3.35	2.08	0.57	1.27	2.4	0.2
	18	4	40	61.9	25.6	12.5	Sandy Loam	4.07	3.39	2.13	0.58	1.29	2.8	0.3
	19	4	43	61.8	26.6	11.6	Sandy Loam	4.02	3.42	2.07	0.56	1.31	2.3	0.3
	20	4	46	60.5	27.0	12.5	Sandy Loam	4.11	3.46	2.15	0.56	1.27	2.6	0.2
	21	4	49	63.5	26.0	10.5	Sandy Loam	3.91	3.34	1.99	0.56	1.33	2.4	0.1
	22	4	52	61.8	26.3	11.9	Sandy Loam	4.04	3.40	2.10	0.57	1.28	1.8	0.2
	23	4	55	60.4	26.9	12.7	Sandy Loam	4.13	3.45	2.17	0.57	1.23	25.1	0.3
	24	4	58	57.7	27.4	14.9	Sandy Loam	4.38	3.58	2.32	0.57	1.14	2.1	0.3
	25	4	60	56.2	27.5	16.3	Sandy Loam	4.52	3.64	2.41	0.57	1.07	3.2	0.1
	26	4	63	58.8	28.1	13.1	Sandy Loam	4.22	3.55	2.18	0.55	1.24	4.0	0.3
	27	4	66	58.4	25.6	16.0	Sandy Loam	4.42	3.50	2.44	0.60	1.10	2.5	0.3
	28	3b	69	58.9	25.5	15.6	Sandy Loam	4.39	3.49	2.44	0.60	1.17	3.3	1.0
	29	3b	71	55.1	25.7	19.2	Sandy Loam	4.69	3.65	2.67	0.59	0.98	3.1	1.3
	30	3b	74	54.6	26.9	18.5	Sandy Loam	4.69	3.72	2.65	0.57	1.02	4.4	1.5
	31	3b	77	55.4	26.4	18.2	Sandy Loam	4.52	3.60	2.58	0.54	0.86	4.0	1.4
	32	3a	80	57.8	26.5	15.7	Sandy Loam	4.40	3.52	2.47	0.58	1.14	4.1	1.5
	33	3a	82	55.9	27.5	16.6	Sandy Loam	4.50	3.62	2.49	0.56	1.02	4.2	1.6
	34	3a	85	51.2	29.8	19.0	Loam	4.75	3.91	2.58	0.51	0.92	4.3	1.4

Column	Sample	Stratum	Depth (cm)	Sand (%)	Silt (%)	Clay (%)	USDA Texture Class	Mean (phi)	Median (phi)	Sorting (phi)	Skewness (phi)	Kurtosis (phi)	Magnetic Susceptibility ($10^{-8}m^3kg^{-1}$)	Loss-on Ignition (%)
BHT 3	1	6	5	46.3	39.5	14.2	Loam	4.61	4.22	2.29	0.35	1.00	4.7	4.4
	2	6	10	49.5	33.3	17.2	Loam	4.67	4.03	2.51	0.43	0.92	5.6	1.9
	3	6	15	43.5	35.1	21.4	Loam	5.06	4.46	2.63	0.38	0.84	3.6	1.3
	4	6	20	37.4	35.4	27.2	Clay Loam	5.47	5.03	2.75	0.27	0.75	4.0	1.4
	5	6	25	40.6	34.4	25.0	Loam	5.27	4.71	2.64	0.33	0.75	3.6	1.2
	6	5	30	36.2	40.2	23.6	Loam	5.34	4.82	2.65	0.32	0.85	4.3	1.2

7	5	35	73.7	17.6	8.7	Sandy Loam	3.43	2.95	1.80	0.61	1.74	3.0	0.6
8	5	40	60.3	25.3	14.4	Sandy Loam	4.25	3.42	2.36	0.60	1.19	3.0	0.5
9	4	45	65.2	22.8	12.0	Sandy Loam	3.93	3.19	2.14	0.62	1.32	2.9	0.3
10	4	50	64.9	23.3	11.8	Sandy Loam	3.93	3.20	2.14	0.61	1.30	2.8	0.3
11	4	55	66.5	22.6	10.9	Sandy Loam	3.82	3.14	2.06	0.62	1.38	2.5	0.3
12	4	60	66.0	23.5	10.5	Sandy Loam	3.82	3.16	2.03	0.60	1.31	2.7	0.2
13	4	65	63.6	23.1	13.3	Sandy Loam	4.08	3.25	2.23	0.62	1.21	2.2	0.2
14	4	70	66.3	22.7	11.0	Sandy Loam	3.84	3.16	2.07	0.61	1.35	2.2	0.2
15	4	75	65.1	23.5	11.4	Sandy Loam	3.92	3.22	2.08	0.60	1.28	4.8	0.3
16	4	80	65.6	22.8	11.6	Sandy Loam	3.90	3.18	2.10	0.61	1.29	2.0	0.2
17	4	85	66.7	23.0	10.3	Sandy Loam	3.79	3.10	2.02	0.62	1.29	2.1	0.2
18	3	90	65.5	22.8	11.7	Sandy Loam	3.91	3.17	2.11	0.62	1.28	1.7	0.2
19	3	95	64.5	23.8	11.7	Sandy Loam	3.96	3.23	2.11	0.61	1.25	2.0	0.3
20	3	100	63.1	23.2	13.7	Sandy Loam	4.13	3.25	2.29	0.63	1.19	1.9	0.4
21	3	105	48.9	22.7	28.4	Sandy Clay Loam	5.24	4.08	2.99	0.54	0.69	2.5	0.8
22	3	110	55.4	24.7	19.9	Sandy Loam	4.70	3.62	2.68	0.59	0.91	4.3	1.7
23	3	115	59.1	24.2	16.7	Sandy Loam	4.44	3.43	2.55	0.62	1.09	3.7	1.6
24	3	120	57.4	24.7	17.9	Sandy Loam	4.56	3.53	2.58	0.61	0.99	3.2	1.3
25	3	125	57.6	24.4	18.0	Sandy Loam	4.55	3.51	2.58	0.61	0.98	3.5	1.5
26	3	130	58.6	24.6	16.8	Sandy Loam	4.45	3.45	2.50	0.62	1.00	3.5	1.6
27	3	135	62.8	21.5	15.7	Sandy Loam	4.28	3.21	2.44	0.67	1.11	3.3	1.5
28	3	140	62.5	22.1	15.4	Sandy Loam	4.27	3.26	2.42	0.65	1.14	3.4	1.4
29	2	145	75.6	18.2	6.2	Sandy Loam	3.30	2.87	1.59	0.59	1.60	1.8	0.7
30	2	150	72.7	18.6	8.7	Sandy Loam	3.50	2.93	1.83	0.63	1.59	1.4	0.4
31	2	155	78.2	16.1	5.7	Loamy Sand	3.18	2.75	1.51	0.62	1.68	0.8	0.2
32	2	160	71.6	19.4	9.0	Sandy Loam	3.57	2.90	1.92	0.65	1.48	0.6	0.2
33	1	165	80.5	14.0	5.5	Loamy Sand	3.08	2.65	1.45	0.65	1.89	0.7	0.1
34	1	170	83.5	11.7	4.8	Loamy Sand	2.92	2.61	1.30	0.61	2.04	0.5	0.2
35	1	175	88.2	8.4	3.4	Sand	2.73	2.54	0.97	0.53	1.87	1.3	0.7
36	1	180	85.3	10.6	4.1	Loamy Sand	2.80	2.53	1.17	0.59	2.07	0.9	0.6

APPENDIX II

Optically Stimulated Luminescence Dating Report

Sheffield Centre for
International Dryland Research

Quartz Optical Dating Report

21st December, 2012

41 HR 1114, Texas, USA

Abstract: Optical luminescence dating (OSL) at the single grain level was applied to coarse quartz grains extracted from six samples taken from the 41 HR 1114 site, Texa, USA. All samples responded well to OSL measurement but analysis of sample replicates indicated most samples had appreciable palaeodose scatter. This is taken to indicate either partial bleaching prior to burial or post-depositional disturbance. Whilst efforts have been made to mitigate the effects of this and ages have been calculated, results for these samples should be treated with some caution. The best estimates of ages range from 3.6 ± 0.23 ka (Shfd12072) to 22.9 ± 1.1 ka (Shfd12077).

1. Introduction: Six samples from the 41 HR 1114, Texas, USA site were submitted for OSL dating by Dr Charles Frederick. All luminescence work was carried out at the Sheffield Centre for International Drylands Research (SCIDR) luminescence laboratory. The samples are assumed not to have been exposed to sunlight during sampling or transportation to the laboratory. Upon arrival, each sample was allocated a Sheffield laboratory number (Table 1). This report provides a brief summary of the procedures employed and results obtained for samples.

Table 1. Sample descriptive data.

Lab No.	Field Reference	Latitude (N)	Longitude (°W)	Altitude (m)	Sampling Depth (cm below surface)
Shfd12072	OSL 1 TU11 42cm	29.79	95.63	26	42
Shfd12073	OSL 2 TU11 60cm	29.79	95.63	26	60
Shfd12074	OSL 3 TU11 80cm	29.79	95.63	26	80
Shfd12075	OSL 4 Trench 3 124cm	29.79	95.63	26	124
Shfd12076	OSL 5 Trench 3 160cm	29.79	95.63	26	160
Shfd12077	OSL 6 Trench 3 177cm	29.79	95.63	26	177

In order to derive an optically stimulated luminescence (OSL) age both the palaeodose (De - the amount of absorbed dose since the sample was buried) and the dose rate (the estimated radiation flux for the sedimentary bodies) have to be determined. Aitken (1998) gives a detailed explanation of both these parameters. To calculate an age, the palaeodose (expressed in Grays) is divided by the annual dose rate (Grays/yr). An inherent assumption in these age calculations is that the sediment was fully reset or 'bleached' by exposure to sunlight during the last transport event or whilst *in situ* prior to burial and that no post-depositional sediment disturbance has occurred. As part of this investigation, efforts have been taken to establish if these sediments have been bleached prior to burial or disturbed by, for example, bioturbation. As the OSL signal measured at the small single aliquot level of measurement is an average of ~2000 grains the true distribution of De values may be masked. This is of particular significance in heterogeneously dosed samples (e.g. poorly reset/bleached) in which grains with a high De signal will dominate the signal at the expense of grains containing a true burial De. The De of grains recently exhumed and bleached due to bioturbation (referred to as zero-dosed grains) are also masked at the single aliquot level. Thus Dr Charles Frederick requested samples underwent OSL measurement at the single grain level of analysis.

2. Dose Rate Analysis: Naturally occurring potassium (K), thorium (Th), rubidium (Rb) and uranium (U) are the main contributors of dose to sedimentary quartz. The concentrations of these elements were determined by inductively coupled plasma mass spectrometry (ICP) at SGS laboratories Ontario Canada (Table 2). Elemental concentrations were converted to annual dose rates using data from Adamiec and Aitken (1998), Marsh et al. (2002), and Aitken (1998). This took into account attenuation factors relating to sediment grain sizes used, density and palaeomoisture. It has been assumed that the samples formed part of a thick homogeneous unit with no gamma contribution (other than from cosmogenic sources) being received by the samples from other unsampled sedimentary units. Attenuation of dose by moisture used the present-day moisture values as measured in the laboratory with a 3 % error to incorporate fluctuations through time (Table 2). The contribution to dose rates from cosmic sources was calculated using the expression published in Prescott and Hutton (1994; Table 2). Cosmic dose is calculated as a linear decay curve at depths below 50 cm. Above this depth, errors in calculation may lead to an under-estimation of the cosmic dose contribution. As some samples were collected from within the top 50 cm of sediment a small error in the calculated cosmic dose rate can be expected.

The dose rates calculated are based on analyses of the sediment sampled at the present day. This assumption is only valid if no movement and/or reprecipitation of the four key elements has taken place since sediment burial and the adjacent sediments to those sampled had similar dose rates. Further analysis would have to be undertaken to establish whether the latter is true and if radioactive disequilibrium is present in the dose rate. It also assumes that the sediments submitted for analyses were representative in terms of radioactivity of sediments within a 50 cm sphere of each OSL sample as all this sediment would be contributing a gamma dose to the OSL samples. The data shows appreciable variability in levels of U, Th and Rb when adjacent samples are compared as a result of which the dose rate varies considerably between 0.625 Gy/ka to 1.375 Gy/ka.

Table 2. *Summary of results – Dosimetry related data.*

Lab Code	U (PPM)	Th (PPM)	Rb (PPM)	K (%)	D_{cosmic} + (Gy/ka)	Moisture (%)	Dose rate† (Gy/ka)
Shfd12072	1.5	3.7	9.7	0.2	0.198 ± 0.01	7.2	0.977 ± 0.035
Shfd12073	1.5	3.6	9.2	0.2	0.193 ± 0.01	7.9	0.958 ± 0.034
Shfd12074	0.23	7	30.6	0.3	0.188 ± 0.009	13.0	1.375 ± 0.051
Shfd12075	0.18	5.4	25.7	0.3	0.177 ± 0.009	11.4	1.172 ± 0.042
Shfd12076	0.71	1.9	6.3	0.2	0.168 ± 0.008	10.8	0.625 ± 0.021
Shfd12077	1.24	3.9	16.9	0.2	0.164 ± 0.008	13.4	0.843 ± 0.029

+ Cosmic dose is calculated as a linear decay curve at depths below 50 cm. Above this depth, errors in calculation may lead to an under-estimation of the cosmic dose contribution.

† Total Dose is attenuated for grain size, density and moisture

3. Palaeodose Determination: The samples were prepared under subdued red lighting following the procedure to extract and clean quartz outlined in Bateman and Catt (1996). Prepared aliquots of the samples were taken from within a size range of 125-180 μm reflecting the dominant size within each sample. All OSL measurements were carried out using a Risø TL DA-15 single grain laser luminescence reader with radiation doses administered using a calibrated ^{90}strontium beta source. Grains were mounted in 300μm pits with 100 pits per 9.6 mm stainless steel aliquot. A focussed 532 nm Nd:YVO_4 laser provided the stimulation and luminescence detection was through a Hoya U-340 filter placed in front of the photomultiplier tube. All grains were analysed using the single aliquot regenerative (SAR) approach (Murray and Wintle 2000, 2003), in which an interpolative growth curve is constructed using data derived from repeated measurements of a single aliquot which has been given various laboratory irradiations (Figure 1a and 1b). The most appropriate preheat temperature for the site was derived experimentally using single aliquots and a dose recovery test with a range of preheat temperatures (after Murray and Wintle, 2003). As Figure 2 shows the 240 °C for 10 s preheat recovers the 12.3 Gy dose within a few percent. The purity of the quartz extract was checked using infrared stimulated luminescence.

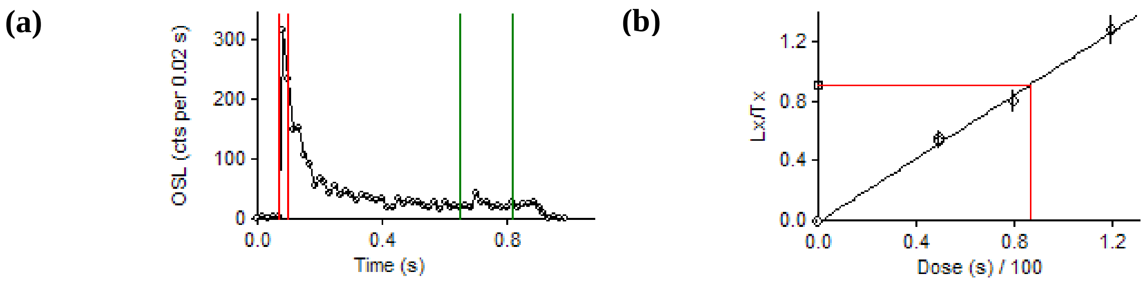

Figure 1: Examples of single grain OSL data (a) single grain OSL decay of naturally acquired signal for sample Shfd12073 (b) Single grain SAR growth curve for sample Shfd12073. Note red lines in (a) indicates block of data used as OSL signal and green lines indicate block of data used as OSL background. Red lines in (b) indicate where naturally acquired OSL signal intercepts with SAR growth curve from which the naturally acquired dose can be calculated.

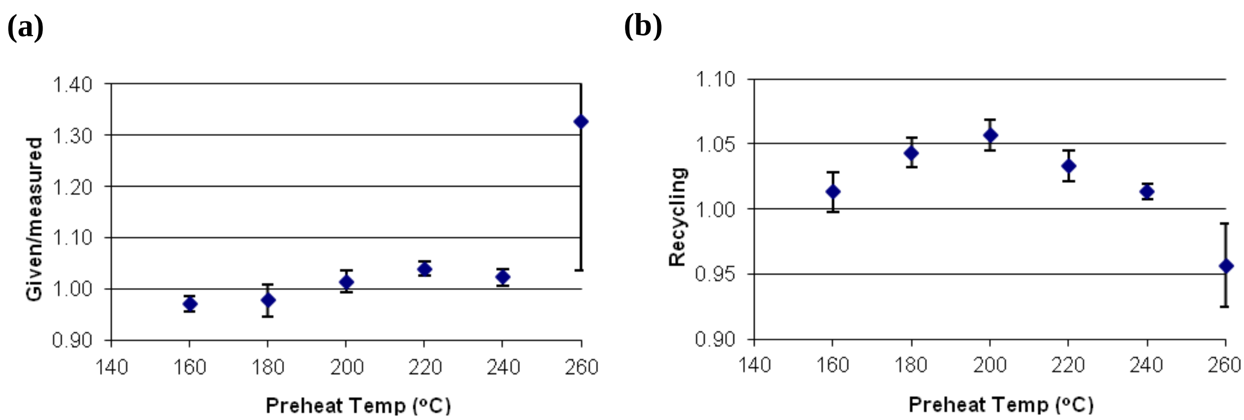

Figure 2 Results of different preheat temperatures in recovering a ~12.3 Gy beta radiation dose from sample Shfd12073 (a) Given to recovered dose (b) recycling.

With all single grain OSL analyses many grains exhibit insufficient OSL signal to be utilised and/or are too poorly behaved for the De to be accurately measured. In this study, De values from individual grains were only accepted they exhibited an OSL signal measurable above background, good growth with dose and the error on the test dose used within the SAR protocol was less than 20%. It was found that the samples exhibited an unusually high proportion of grains with detectable signal and which were well behaved and sufficiently sensitive to laboratory dose that they yielded reliable palaeodoses. Therefore in order to get sufficient data, only between 300 and 600 grains were measured.

4. Sedimentary bleaching behaviour: The effects of incomplete bleaching of the sediment during the last period of transport or exposure *in situ* can be profound. Typically, poorly bleached sediments retain a significant level of residual signal from previous phases of sedimentary cycling, leading to inherent inaccuracies in the calculation of a palaeodose value. By plotting the replicate data for each sample as a probability density function some assessment of whether older or younger material has been included in the sample measurements can be made (Figure 3). In principle a well bleached unpost-depositionally disturbed sample should have replicate palaeodose (De) data which is normally distributed and highly reproducible (See Bateman *et al.* 2003, Fig 3; Bateman et al 2007a). Where post-depositional disturbance or incomplete bleaching prior to sample burial has occurred skewing of this distribution may occur and/or replicate reproducibility may be lower (Bateman et al 2007a; Bateman *et al.* 2007b). In the case of poorly bleached material skewing should be evident with a high De tail (e.g. Olley *et al.* 2004).

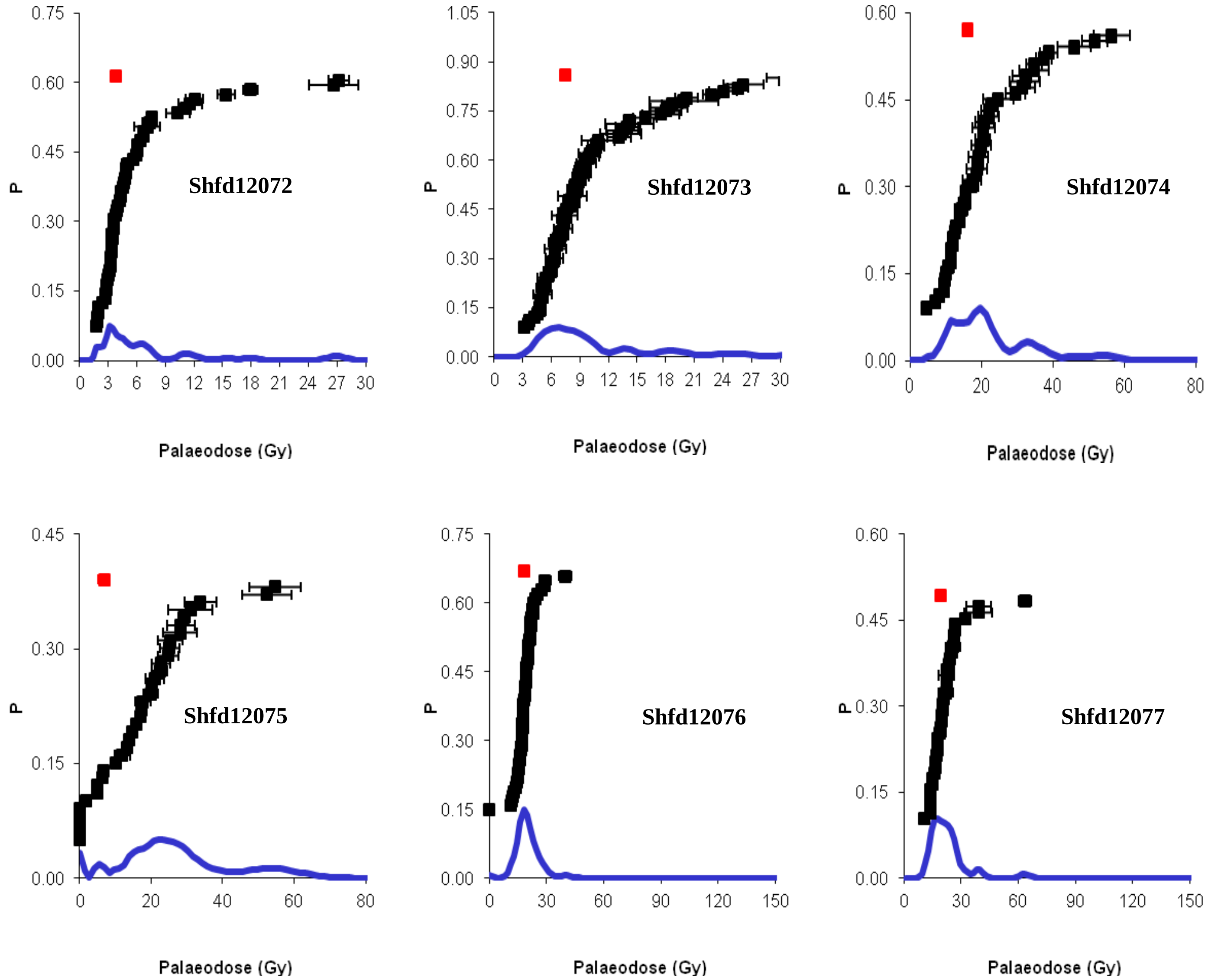

Figure 3: Examples of combined probability density functions for the single grain OSL measurements showing degree of inter-aliquot scatter. Also plotted are individual grain De (black) and the unweighted mean De (red).

As Figure 3 and Table 3 (see also appendix) shows, the De distributions measured for four of the six samples (Shfd12072-Shfd12075) have high OD values and have multiple De modes. This is taken to indicate that the deposits have either undergone some post-depositional disturbance since deposition and/or include unbleached grains. Sample Shfd12075 contains some zero De values interpreted to indicate grains which have very recently been exposed to sunlight perhaps by bioturbation. In order to try and better understand the De distrubutions, the De values for these samples were statistically analysed using the finite mixture model (FMM: Roberts at al 2000). This model attempts to extract the different multiple components contained within the De distributions. Results from this (excluding any component representing less than 10% of data as per Bateman et al 2010) are shown in Table 3.

Table 3. Results of Single grain level of analysis with Finite Mixture modelling used on De data to extract multiple components for each sample. Ages derived from the lowest significant De or dominant De are highlighted in bold.

Lab Code	**Field Ref.**	**Depth (cm)**	**FMM component**[a]	**De** (Gy)	**Proportion of grains** (%)	**Dose rate**[†] (Gy/ka)	**Age** (ka)
Shfd12072	OSL 1 TU11 42cm	42	1	1.98	11	0.977 ± 0.035	2.0 ± 0.23
			2	3.51	49		**3.6 ± 0.23**
			3	5.92	26		6.1 ± 0.49
			4	12.92	11		13.2 ± 1.2
Shfd12073	OSL 2 TU11 60cm	60	1	4.94	27	0.958 ± 0.034	**5.2 ± 0.39**
			2	8.09	49		8.4 ± 0.51
			3	15.83	15		16.5 ± 1.5
Shfd12074	OSL 3 TU11 80cm	80	1	11.53	34	1.375 ± 0.051	**8.4 ± 0.69**
			2	19.14	40		13.9 ± 1.0
			3	38.39	22		27.9 ± 1.9
Shfd12075	OSL 4 Trench 3 124cm	124	1	5.71	14	1.172 ± 0.042	4.9 ± 0.51
			2	14.89	31		**12.7 ± 1.2**
			3	24.42	44		20.8 ± 1.7
Shfd12076	OSL 5 Trench 3 160cm	160		18.06	n/a	0.625 ± 0.021	**28.9 ± 1.1**
Shfd12077	OSL 6 Trench 3 177cm	177		19.27	n/a	0.680 ± 0.029	**22.9 ± 1.1**

[a] only component representing more than 10% of De data are reported.

[†] Total Dose is attenuated for grain size, density and moisture as well as assuming sample saturation prior to 13 ka before present.

[‡] De extracted using the central age model as good reproducibility

For partially bleached samples it has been argued that the first De mode should closest relate to the true burial age. This is suggested to be the case for sample Shfd12073 and Shfd12074. For disturbed sediments the dominant (that incorporating the results of the most number of aliquots) should closest relate to the true burial age (Bateman *et al.* 2007a,b). This is suggested to be the case for samples Shfd12072 and Shfd12075. Both samples Shfd12076 and Shfd12077 were normally distributed and so are considered to have been well reset prior to burial. Ages for these samples are based on a mean value from all the replicates measured (once outliers beyond 2 standard deviations of the mean were excluded).

5. Age Calculation and Conclusions: Ages are quoted in ka from the present day (2012) and are presented with one sigma confidence intervals which incorporate systematic uncertainties with the dosimetry data, uncertainties with the palaeomoisture content and errors associated with the De determination. Table 3 shows the final OSL age estimates for each component recognised within a sample. Grain data for each sample are included in appendix 1. The data presented show four of the six samples had appreciable De scatter. It is thought this maybe due to post-depositional disturbance for samples Shfd12072 and Shfd12075 and partial bleaching for samples Shfd12073 and Shfd12074. Whilst efforts have been made to mitigate the impact of this, ages may still incorporate some problems and should be treated with due caution. Ages presented in Tables 3 should be viewed in alongside site stratigraphy and sedimentological evidence that might provide information of depositional and post-depositional contexts within which the OSL results could be interpreted. The best estimates of ages range from 3.6 ± 0.23 ka (Shfd12072) to 22.9 ± 1.1 ka (Shfd12077).

Prof Mark D. Bateman

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Appendix 1

Single grain data and plots for the 41 HR 1114, East Texas.

Sample specific data including:-

- list of De's derived from aliquots
- calculated statics for De distribution (Skewness, kurtosis and sorting)
- calculated means based on a range of statistical models including Finite Mixture Modelling (FMM)
- histogram plot of distribution of De within a sample
- probability density plot (curve) with ranked De data (black points) and probability mean (uppermost red point).

Field Code:	**OSL 1 TU11 42cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12072**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	**Palaeodose (Gy)**	**error**	**Aliquot**	**Palaeodose (Gy)**	**error**
1	15.369	0.919	26	3.202	0.399
2	4.545	0.215	27	3.963	0.437
3	11.088	0.446	28	1.744	0.265
4	6.335	0.242	29	10.310	1.239
5	3.340	0.373	30	3.407	0.253
6	3.923	0.258	31	2.690	0.509
7	3.034	0.145	32	5.585	0.285
8	11.585	1.260	33	4.319	0.354
9	6.741	0.324	34	3.262	0.200
10	1.878	0.135	35	6.707	0.396
11	3.518	0.376	36	7.542	0.478
12	2.886	0.257	37	17.915	0.725
13	3.108	0.167	38	3.613	0.278
14	3.232	0.238	39	26.632	2.577
15	12.085	0.915	40	4.754	0.237
16	2.373	0.301	41	5.911	0.264
17	5.057	0.583	42	2.807	0.455
18	3.442	0.582	43	3.399	0.311
19	27.220	1.064	44	1.931	0.292
20	7.337	0.763	45	3.801	0.360
21	1.837	0.346	46	3.621	0.353
22	4.219	0.200	47	4.636	0.329
23	3.387	0.185	48	2.772	0.267
24	4.342	0.470	49	2.692	0.231
25	1.898	0.205	50	7.087	1.343
			51	6.075	0.436
			52	4.917	0.296
			53	4.819	0.476
			54	6.067	0.574

Field Code:	**OSL 1 TU11 42cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12072**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Unweighted	All Data	Minus Outliers
Mean (Gy)	5.93	4.08
SD	5.32	1.57
SE	0.72	0.21
N	54	46

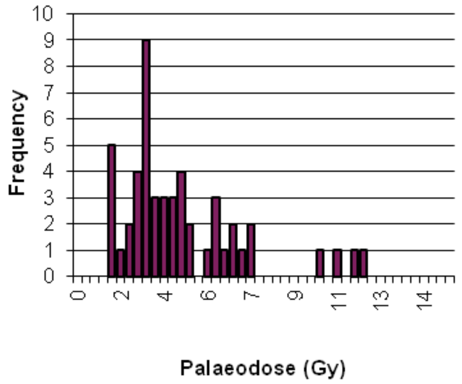
De Distribution	**All Data**	**Minus Outliers**
Skewness	3.64	-0.07
Kurtosis	8.04	-0.46
Median	4.09	3.62
Sorting	0.56	0.27

Weighted	All Data	Minus Outliers
Mean (Gy)	3.76	3.56
SD	2.05	1.33
SE	0.28	0.20
N	54	46

Central Age Model	All Data	Minus Outliers
Mean (Gy)	4.69	3.83
SD	0.41	0.22
OD (all data)	62.15%	36.69%
N	54	46

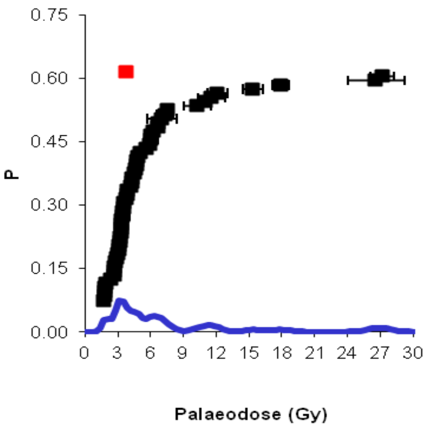
	De (Gy)	**error**
Minimum	1.74	0.27
Maximum	27.22	1.06
N	54	

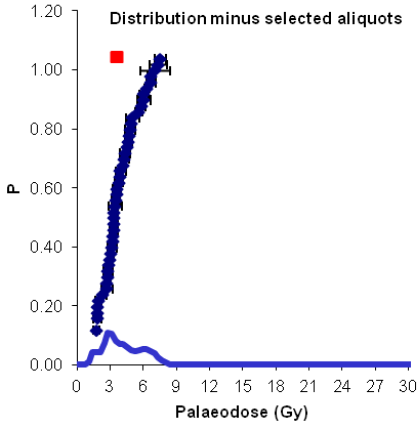
Probability	All Data	Minus Outliers
Mean (Gy)	3.82	3.66
SD	1.90	1.14
SE	0.26	0.17
N	54	46



Finite Mixture Modelling

Component	Mean De (Gy)	Error	Proportion
1	1.98	0.21	11%
2	3.51	0.19	49%
3	5.92	0.43	26%
4	12.92	1.06	11%
5	26.07	4.23	4%





Field Code:	**OSL 2 TU11 60cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12073**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	Palaeodose (Gy)	error	Aliquot	Palaeodose (Gy)	error
1	10.933	1.722	40	4.822	0.237
2	8.084	0.734	41	15.837	1.268
3	9.033	0.451	42	3.525	0.260
4	8.366	0.675	43	6.387	0.575
5	8.464	0.410	44	8.043	0.715
6	7.372	0.771	45	17.971	1.666
7	6.369	0.319	46	5.165	0.700
8	14.163	2.531	47	13.950	1.192
9	6.087	0.395	48	10.320	0.566
10	7.426	0.678	49	5.901	0.676
11	7.045	0.475	50	7.358	0.573
12	26.160	2.085	51	8.241	1.503
13	17.484	1.903	52	6.671	0.745
14	5.346	0.613	53	5.045	0.411
15	4.872	0.262	54	20.178	1.136
16	13.278	2.204	55	7.385	1.314
17	3.144	0.262	56	7.011	0.756
18	22.803	0.881	57	10.806	0.712
19	18.708	1.081	58	19.900	3.575
20	25.589	1.114	59	4.766	0.497
21	4.576	0.501	60	9.661	1.036
22	5.374	0.307	61	8.439	0.808
23	4.763	0.676	62	5.056	0.944
24	14.172	0.606	63	6.569	0.807
25	5.954	0.483	64	6.201	0.638
26	31.366	1.438	65	9.348	0.837
27	4.245	0.342	66	8.061	0.860
28	13.535	1.742	67	9.077	0.896
29	7.224	1.001	68	9.958	1.010
30	6.564	0.342	69	10.704	0.847
31	3.673	0.193	70	9.324	0.859
32	10.001	1.147	71	31.400	2.809
33	6.395	1.128	72	6.349	0.896
34	5.746	0.554	73	13.089	1.245
35	18.341	1.990	74	9.663	0.710
36	5.115	0.471	75	8.699	0.656
37	24.052	1.466	76	7.281	0.522
38	7.598	0.602	77	9.208	0.937
39	5.376	0.805			

Field Code:	**OSL 2 TU11 60cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12073**		**Texas ,USA**
Aliquot Size:	**Single aliquot**		

	De (Gy)	error
Minimum	3.14	0.26
Maximum	31.40	2.81
N	77	

De Distribution	All Data	Minus Outliers
Skewness	2.30	-0.17
Kurtosis	2.48	0.14
Median	8.06	7.32
Sorting	0.55	0.26

Unweighted

	All Data	Minus Outliers
Mean (Gy)	10.16	7.69
SD	6.37	2.72
SE	0.73	0.31
N	77	64

Central Age Model

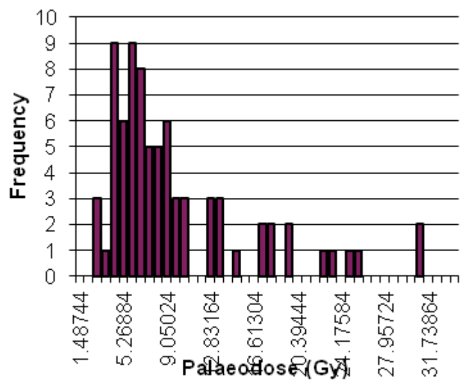
	All Data	Minus Outliers
Mean (Gy)	8.74	7.23
SD	0.53	0.32
OD (all data)	52.19%	33.36%
N	77	64

Weighted

	All Data	Minus Outliers
Mean (Gy)	6.30	5.88
SD	3.44	2.21
SE	0.39	0.28
N	77	64

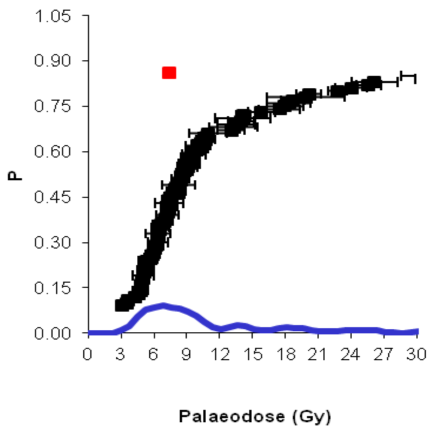
Probability

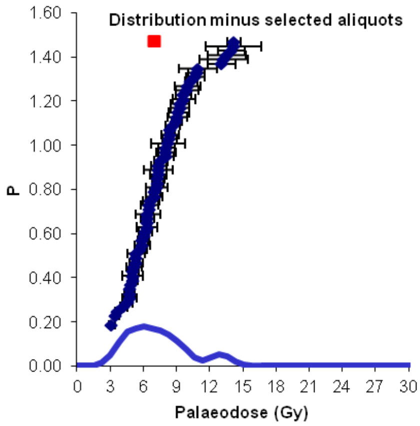
	All Data	Minus Outliers
Mean (Gy)	7.43	7.05
SD	3.08	2.02
SE	0.35	0.25
N	77	64



Finite Mixture Modelling

Component	Mean De (Gy)	Error	Proportion
1	4.94	0.33	27%
2	8.09	0.39	49%
3	15.83	1.32	15%
4	25.33	2.30	9%
5			





Field Code:	**OSL 3 TU11 80cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12074**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	Palaeodose (Gy)	error	Aliquot	Palaeodose (Gy)	error
1	11.965	0.723	26	12.527	1.144
2	17.465	2.570	27	4.497	0.502
3	32.522	3.714	28	32.201	4.256
4	31.558	3.493	29	11.403	1.305
5	9.917	0.542	30	20.396	2.048
6	34.770	4.015	31	20.075	2.710
7	9.556	1.165	32	20.517	0.984
8	45.919	4.637	33	22.283	2.309
9	38.906	2.389	34	24.692	4.256
10	18.590	0.984	35	20.637	3.192
11	12.005	0.522	36	19.674	1.385
12	19.232	2.750	37	22.926	1.646
13	15.458	0.903	38	9.475	1.165
14	15.659	1.164	39	10.760	1.425
15	11.403	0.823	40	14.053	0.743
16	20.878	2.550	41	34.770	2.228
17	13.852	0.964	42	12.808	0.964
18	10.198	1.024	43	7.147	0.462
19	56.492	5.079	44	37.581	2.208
20	29.591	2.730	45	17.265	1.907
21	18.750	2.830	46	15.217	1.626
22	22.043	2.991	47	19.031	1.425
23	14.374	1.827	48	51.846	3.523
24	11.483	0.763			
25	8.151	0.562			

Field Code:	**OSL 3 TU11 80cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12074**		**Texas ,USA**
Aliquot Size:	**Single grain**		

	De (Gy)	**error**
Minimum	4.50	0.50
Maximum	56.49	5.08
N	48	

De Distribution	**All Data**	**Minus Outliers**
Skewness	1.29	-0.16
Kurtosis	1.50	-0.06
Median	18.67	17.26
Sorting	0.51	0.33

Unweighted

	All Data	Minus Outliers
Mean (Gy)	20.68	17.72
SD	11.64	7.68
SE	1.68	1.11
N	48	43

Central Age Model

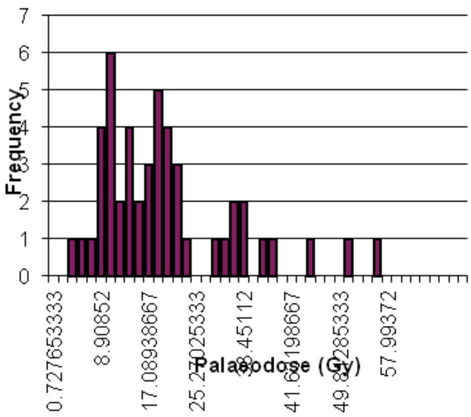
	All Data	Minus Outliers
Mean (Gy)	17.95	16.06
SD	1.38	1.09
OD (all data)	52.37%	43.39%
N	48	43

Weighted

	All Data	Minus Outliers
Mean (Gy)	12.13	11.72
SD	6.16	5.06
SE	0.89	0.77
N	48	43

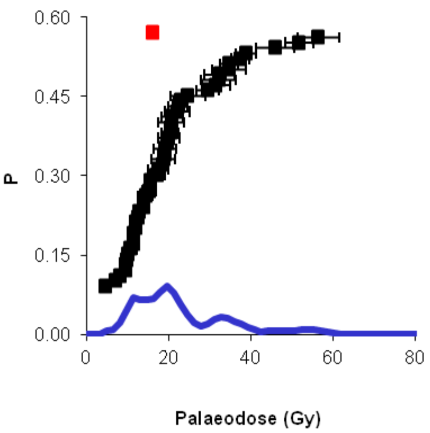
Probability

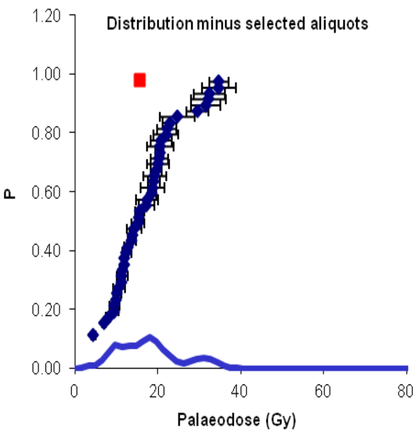
	All Data	Minus Outliers
Mean (Gy)	16.21	15.64
SD	6.92	5.74
SE	1.00	0.88
N	48	43



Finite Mixture Modelling

Component	Mean De (Gy)	Error	Proportion
1	5.92	1.22	4%
2	11.53	0.85	34%
3	19.14	1.23	40%
4	38.39	2.22	22%
5			





Field Code:	**OSL 4 Trench 3 124cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12075**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	Palaeodose (Gy)	error	Aliquot	Palaeodose (Gy)	error
1	20.196	1.305	26	13.972	1.064
2	25.375	3.433	27	19.914	2.068
3	28.266	3.935	28	25.174	2.791
4	22.444	2.168	29	17.706	2.168
5	17.385	1.445	30	15.739	0.883
6	22.605	2.590	31	21.039	2.570
7	29.109	1.566	32	28.105	4.657
8	24.692	2.931	33	52.319	6.868
9	6.344	0.441	34	54.808	7.189
10	14.775	1.185	35		
11	-0.441	0.382	36		
12	-0.120	0.482	37		
13	1.767	0.161	38		
14	4.778	0.602	39		
15	4.818	0.662	40		
16	-0.402	1.024	41		
17	-0.441	0.522	42		
18	16.903	1.084	43		
19	6.745	0.883	44		
20	-0.040	0.181	45		
21	13.370	0.743	46		
22	30.956	6.143	47		
23	11.844	2.168	48		
24	33.807	4.357	49		
25	10.078	1.064	50		

Field Code:	**OSL 4 Trench 3 124cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12075**		**Texas ,USA**
Aliquot Size:	**Single grain**		

	De (Gy)	error
Minimum	0.00	0.18
Maximum	54.81	7.19
N	34	

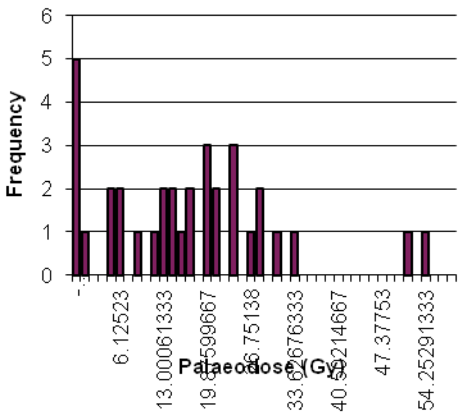
De Distribution	All Data	Minus Outliers
Skewness	0.95	-0.01
Kurtosis	1.11	-1.16
Median	17.14	16.32
Sorting	0.71	0.60

Unweighted	All Data	Minus Outliers
Mean (Gy)	17.50	15.25
SD	13.63	10.42
SE	2.34	1.79
N	34	32

Central Age Model	All Data	Minus Outliers
Mean (Gy)	16.51	15.14
SD	2.25	2.00
OD (all data)	72.47%	67.52%
N	34	32

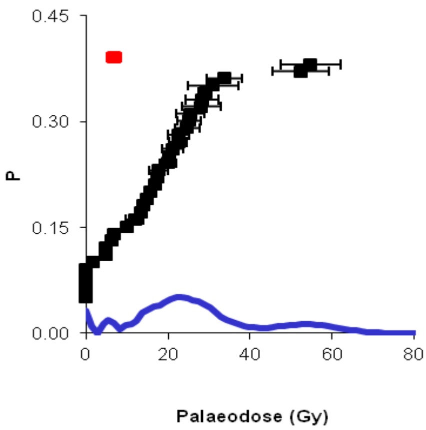
Weighted	All Data	Minus Outliers
Mean (Gy)	2.77	2.75
SD	4.99	4.90
SE	0.86	0.87
N	34	32

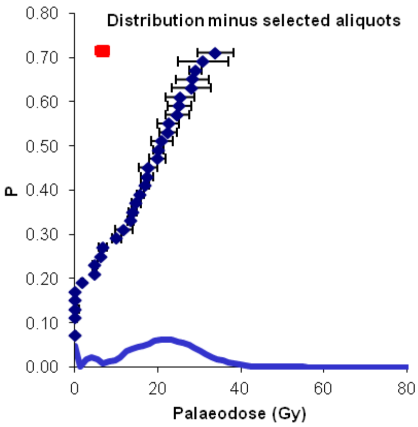
Probability	All Data	Minus Outliers
Mean (Gy)	6.80	6.67
SD	9.83	9.54
SE	1.69	1.69
N	34	32



Finite Mixture Modelling

Component	Mean De (Gy)	Error	Proportion
1	1.77	0.31	3%
2	5.71	0.56	14%
3	14.89	1.24	31%
4	24.42	1.78	44%
5	52.65	8.08	7%





Field Code:	**OSL 5 Trench 3 160cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12076**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	Palaeodose (Gy)	error	Aliquot	Palaeodose (Gy)	error
1	17.434	0.811	26	18.881	0.965
2	24.185	1.905	27	20.104	1.075
3	21.629	1.939	28	28.777	2.291
4	25.201	2.260	29	17.637	1.451
5	17.874	1.337	30	14.174	1.751
6	16.923	2.917	31	23.305	1.206
7	27.278	2.792	32	17.042	1.436
8	21.150	2.923	33	17.286	1.119
9	21.207	1.012	34	21.540	1.302
10	16.137	0.675	35	15.504	1.399
11	11.278	0.734	36	14.727	1.296
12	21.590	2.984	37	16.389	1.055
13	20.381	1.130	38	18.610	2.517
14	17.588	1.106	39	12.279	1.857
15	20.101	2.057	40	12.708	1.460
16	19.134	1.665	41	-3.730	1.408
17	29.186	2.820	42	22.102	1.688
18	17.449	2.119	43	39.913	3.234
19	17.015	1.631	44	16.005	1.638
20	22.837	2.825	45	17.438	2.969
21	18.793	1.259	46	19.310	2.177
22	22.778	0.894	47	19.384	1.430
23	17.946	1.386	48	20.343	2.680
24	19.237	1.918	49	13.911	1.628
25	15.418	1.611	50	19.929	1.012
			51	15.047	2.794
			52	11.695	2.227

Field Code:	**OSL 5 Trench 3 160cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12076**		**Texas ,USA**
Aliquot Size:	**Single grain**		

	De (Gy)	error
Minimum	0.00	1.41
Maximum	39.91	3.23
N	52	

De Distribution	All Data	Minus Outliers
Skewness	1.23	-0.08
Kurtosis	5.12	-0.31
Median	18.70	17.95
Sorting	0.23	0.17

Unweighted

	All Data	Minus Outliers
Mean (Gy)	18.92	18.27
SD	5.57	3.27
SE	0.77	0.45
N	52	47

Central Age Model

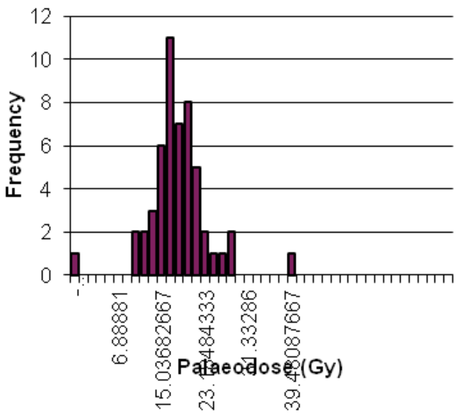
	All Data	Minus Outliers
Mean (Gy)	18.92	18.20
SD	0.61	0.48
OD (all data)	20.95%	15.26%
N	52	47

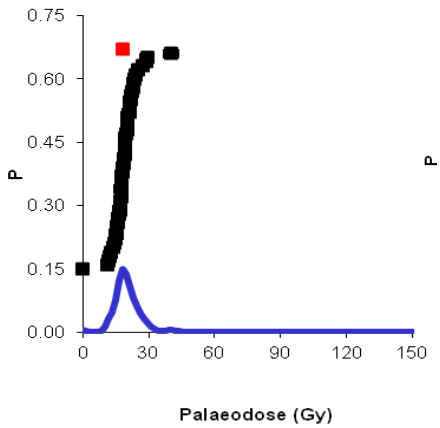
Weighted

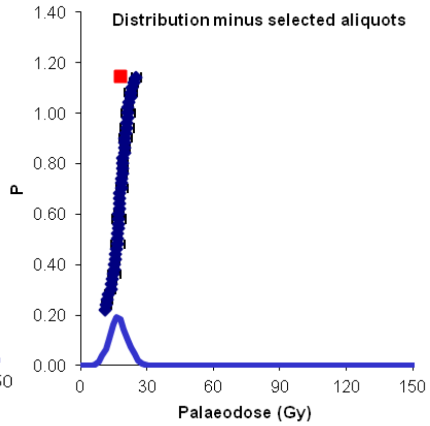
	All Data	Minus Outliers
Mean (Gy)	17.79	17.87
SD	4.44	3.24
SE	0.62	0.47
N	52	47

Probability

	All Data	Minus Outliers
Mean (Gy)	18.21	18.06
SD	2.92	2.63
SE	0.41	0.38
N	52	47







Field Code:	**OSL 6 Trench 3 177cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12077**		**Texas ,USA**
Aliquot Size:	**Single grain**		

Aliquot	Palaeodose (Gy)	error	Aliquot	Palaeodose (Gy)	error
1	17.028	1.460	26	19.595	1.015
2	39.159	6.333	27	25.519	3.814
3	26.886	1.935	28	20.367	2.808
4	20.931	1.019	29	19.220	1.296
5	16.620	1.271	30	13.749	2.419
6	39.008	7.227	31	32.136	1.643
7	16.589	1.664	32	13.734	1.636
8	26.166	1.705	33	20.342	1.713
9	14.912	1.416	34	18.799	2.893
10	13.790	1.697	35	23.825	1.706
11	22.682	2.076	36	22.361	1.421
12	17.875	1.495	37	10.703	0.676
13	14.043	2.163	38	17.379	1.466
14	26.110	2.532	39	63.437	3.099
15	21.771	3.759			
16	25.330	1.352			
17	19.888	2.007			
18	14.097	1.706			
19	26.953	1.474			
20	17.402	1.011			
21	15.100	0.885			
22	22.471	4.056			
23	22.305	1.326			
24	16.124	2.857			
25	24.155	1.567			

Field Code:	**OSL 6 Trench 3 177cm**	**Site:**	**Katy Moore**
Lab Code:	**Shfd12077**		**Texas ,USA**
Aliquot Size:	**Single grain**		

	De (Gy)	**error**
Minimum	10.70	0.68
Maximum	63.44	3.10
N	39	

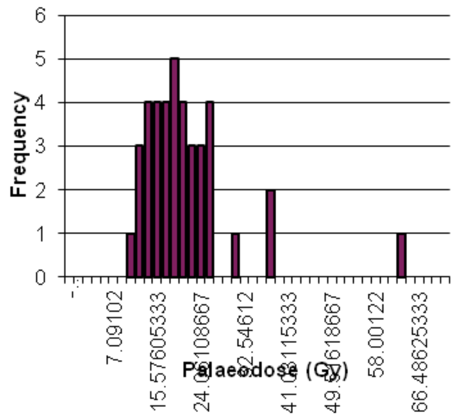
De Distribution	**All Data**	**Minus Outliers**
Skewness	3.90	-0.10
Kurtosis	9.84	-0.35
Median	20.34	19.74
Sorting	0.30	0.21

Unweighted	All Data	Minus Outliers
Mean (Gy)	22.01	19.92
SD	9.30	4.86
SE	1.49	0.78
N	39	36

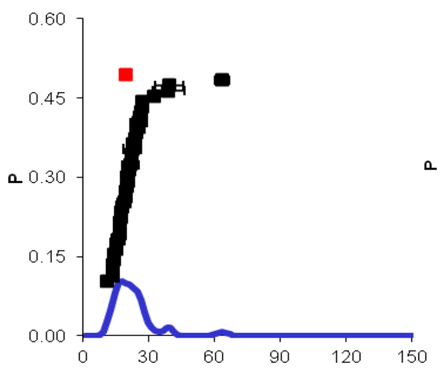
Central Age Model	All Data	Minus Outliers
Mean (Gy)	20.70	19.50
SD	1.12	0.82
OD (all data)	32.03%	23.03%
N	39	36

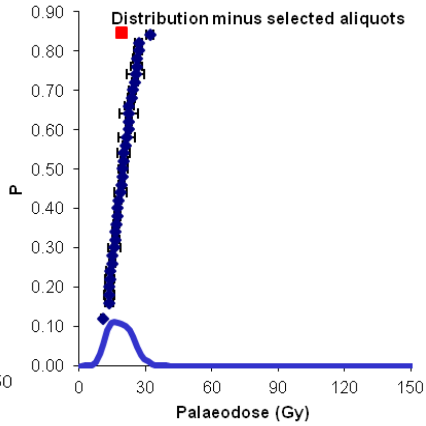
Weighted	All Data	Minus Outliers
Mean (Gy)	18.80	18.46
SD	6.23	5.05
SE	1.00	0.84
N	39	36

Probability	All Data	Minus Outliers
Mean (Gy)	19.50	19.27
SD	4.75	4.06
SE	0.76	0.68
N	39	36



Finite Mixture Modelling			
Component	Mean De (Gy)	Error	Proportion
1	16.41	1.22	48%
2	24.17	1.76	49%
3	61.54	11.02	3%
4			
5			





Palaeodose (Gy)

Appendix III

Microartifact Report

Profile	Sample	Dry Sample Mass g	Depth cm	Lithics 2mm count	Lithics 2mm weight (g)	Lithics 4mm count	Lithics 4mm weight (g)	Lithic Totals 2mm & 4 mm count	2mm & 4 mm weight (g)	Ratio Microdebitage to Macrodebitage	FeMn 2mm count	FeMn 2mm weight (g)	FeMn 4mm count	FeMn 4mm weight (g)	FeMn Totals 2mm & 4 mm count	2mm & 4 mm weight (g)
XU 11	1	2441.7	2.5	1	0.2	1	0.1	2	0.3	1	18	0.57	9	1.04	27	1.61
	2	2970.5	7.5	1	0.01	2	0.37	3	0.38	0.5	37	1.15	21	4.41	58	5.56
	3	3017.1	12.5	1	0.01	0	0	1	0.01	0	32	0.83	5	1	37	1.83
	4	2898.3	17.5	2	0.01	1	0.08	3	0.09	2	27	0.61	5	0.75	32	1.36
	5	2469.9	22.5	2	0.02	1	0.13	3	0.15	2	7	0.18	0	0	7	0.18
	6	3120.6	27.5	0	0	0	0	0	0	0	8	0.24	3	0.4	11	0.64
	7	2667.0	32.5	9	0.1	4	0.75	13	0.85	2.25	70	1.73	24	4.67	94	6.4
	8	3463.7	37.5	5	0.03	3	0.82	8	0.85	1.666666667	108	2.54	56	14.86	164	17.4
	9	4160.4	42.5	8	0.1	4	11.66	12	11.76	2	104	2.67	2	0.58	106	3.25
	10	3822.5	47.5	5	0.03	2	0.58	7	0.61	2.5	122	3.36	73	14.33	195	17.69
	11	3676.2	52.5	2	0.01	1	0.08	3	0.09	2	139	3.98	75	16.38	214	20.36
	12	4275.4	57.5	2	0.01	2	0.65	4	0.66	1	218	6.55	161	40.53	379	47.08
	13	4420.6	62.5	3	0.06	1	0.31	4	0.37	3	355	12.87	347	148.64	702	161.51
	14	3731.0	67.5	2	0.02	4	25.2	6	25.22	0.5	397	12.42	304	113.33	701	125.75
	15	3222.8	72.5	1	0.01	0	0	1	0.01	0	413	13.06	246	76.8	659	89.86
	16	4001.2	77.5	0	0	0	0	0	0	0	682	18.71	392	126.91	1074	145.62
	17	3428.6	82.5	0	0	0	0	0	0	0	606	13.26	234	67.11	840	80.37

Profile	Sample	Dry Sample Mass g	Depth (cm)	Lithics 2mm count	Lithics 2mm weight (g)	Lithics 4mm count	Lithics 4mm weight (g)	Lithics 2mm & 4 mm count	2mm & 4 mm weight (g)	Ratio Microdebitage to Macrodebitage	FeMn 2mm count	FeMn 2mm weight (g)	FeMn 4mm count	FeMn 4mm weight (g)	FeMn Totals 2mm & 4 mm count	2mm & 4 mm weight (g)
BHT 3	1	4072.4	5	0	0	0	0	0	0	0	36	1.15	5	2.4	41	3.55
	2	3722.0	10	3	0.05	1	0.06	4	0.11	3	67	1.56	15	2.74	82	4.3
	3	3170.8	15	1	0.02	0	0	1	0.02	0	29	0.91	13	2.39	42	3.3
	4	3827.5	20	0	0	0	0	0	0	0	24	0.92	7	1.12	31	2.04
	5	1781.3	25	0	0	0	0	0	0	0	4	0.07	1	0.06	5	0.13
	6	3044.8	30	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	1464.9	35	1	0.01	0	0	1	0.01	0	45	1.33	4	0.63	49	1.96
	8	2223.6	40	6	0.1	4	0.29	10	0.39	1.5	88	1.76	45	9.79	133	11.55
	9	2188.0	45	10	0.15	4	0.58	14	0.73	2.5	105	2.36	58	8.57	163	10.93

10	2625.1	50	4	0.04	2	0.14	6	0.18	2	154	3.71	65	10.53	219	14.24
11	2397.6	55	7	0.1	0	0	7	0.1	0	118	2.79	68	11.65	186	14.44
12	2523.5	60	3	0.03	2	1.77	5	1.8	1.5	139	2.97	107	24.27	246	27.24
13	2122.4	65	1	0.01	0	0	1	0.01	0	176	3.66	110	28.74	286	32.4
14	4885.8	70	4	0.03	2	0.17	6	0.2	2	326	5.88	172	41.78	498	47.66
15	2343.8	75	3	0.04	2	1.11	5	1.15	1.5	147	3.55	151	41.5	298	45.05
16	2218.5	80	2	0.05	0	0	2	0.05	0	115	2.89	162	33.05	277	35.94
17	2942.3	85	1	0.14	1	1.97	2	2.11	1	187	4.26	250	78.25	437	82.51
18	2163.4	90	0	0	0	0	0	0	0	299	9.15	282	105.96	581	115.11
19	4654.7	95	0	0	0	0	0	0	0	581	18.56	306	148.84	887	167.4
20	2772.7	100	0	0	0	0	0	0	0	431	11.97	208	83.22	639	95.19
21	3306.7	105	0	0	0	0	0	0	0	803	21.94	168	43.91	971	65.85
22	5921.5	110	0	0	0	0	0	0	0	436	11.39	135	37.4	571	48.79
23	3246.2	115	0	0	0	0	0	0	0	387	9.68	132	36.73	519	46.41
24	2639.7	120	0	0	0	0	0	0	0	291	8.35	79	24.54	370	32.89
25	2809.0	125	0	0	0	0	0	0	0	225	5.31	129	35.64	354	40.95
26	3209.2	130	0	0	0	0	0	0	0	309	8.15	78	18.87	387	27.02
27	3272.2	135	0	0	0	0	0	0	0	202	5.53	56	13.92	258	19.45
28	3482.3	140	0	0	0	0	0	0	0	165	4.17	73	13.22	238	17.39
29	3112.5	145	0	0	0	0	0	0	0	175	4.37	26	5.17	201	9.54
30	3458.5	150	0	0	0	0	0	0	0	214	5.15	84	23.47	298	28.62
31	5831.7	155	0	0	0	0	0	0	0	184	4.48	65	27.37	249	31.85
32	3573.6	160	0	0	0	0	0	0	0	191	5.32	128	52.95	319	58.27
33	3079.7	165	0	0	0	0	0	0	0	72	1.63	25	5.6	97	7.23
34	3857.2	170	0	0	0	0	0	0	0	64	1.18	26	7.34	90	8.52
35	7820.0	175	0	0	0	0	0	0	0	12	0.27	15	8.53	27	8.8
36	3671.0	180	0	0	0	0	0	0	0	7	0.13	20	8.53	27	8.66

APPENDIX IV:

Tabular data of all lithic artifacts

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Survey	9	1	4	1	1	2	1	0.2						
Survey	9	2	4	2	1	2	2	0.3	1	0.1				1.1
Survey	9	3	4	1	1	2	1	0.1						
Survey	9	6	4	1	1	2	1	0.1	1	0.1				1.1
Survey	9	7	4	2	1	2	1	0.1						
Survey	9	8	4	2	1	2	1	0.1						
Survey	9	9	4	2	1	2	1	0.1						
Survey	9	10	4	2	1	2	1	0.2						
Survey	49	6	4	2	1	2	1	0.1						
Survey	49	7	3	1	1	2	1	1.8						
Survey	49	7	3	2	1	2	1	0.7						
Survey	49	7	3	2	2	2	1	1.6						
Survey	49	7	1	2	1	2	1	2.9						
Survey	49	7	1	1	1	2	1	5.3						
Survey	49	8	4	2	1	2	2	0.9						
Survey	49	8	4	1	1	1	1	0.4						
Survey	49	8	4	1	1	2	1	0.3						
Survey	49	8	3	2	1	2	1	0.6						
Survey	49	8	3	1	1	2	1	1.4						
Survey	49	8	3	1	1	1	1	1.4						
Survey	49	9	3	1	1	1	1	0.9						
Survey	49	9	4	2	1	2	1	0.2						
Survey	49	10	1	1	1	2	1	2.5						
Survey	49	10	3	2	1	2	2	2	1	1.9				2.9
Survey	49	10	3	1	1	2	1	2.3						
Survey	49	10	3	2	1	2	1	1.8						
Survey	50	1	3	2	1	2	1	0.4						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Survey	50	1	4	2	1	1	1	0.1						
Survey	50	4	3	1	1	2	1	0.5						
Survey	50	4	4	2	1	2	1	0.1						
Survey	50	4	4	1	1	2	1	0.1						
Survey	50	5	4	2	1	1	1	0.1						
Survey	50	5	4	2	1	2	3	0.2						
Survey	50	6	4	1	1	2	3	0.4						
Survey	50	6	3	2	1	1	1	0.3						
Survey	50	7	4	2	1	1	1	0.1						
Survey	50	7	4	2	1	2	2	0.2						
Survey	50	8	4	2	1	2	1	0.2						
Survey	51	3	4	1	1	2	1	0.2						
Survey	51	3	4	2	1	2	1	0.1						
Survey	51	3	4	1	1	1	1	0.2						
Survey	51	4	4	2	1	2	3	0.5						
Survey	51	4	4	1	1	1	1	0.2	1	0.1				1.1
Survey	51	5	4	2	1	2	4	0.5						
Survey	51	7	3	2	1	2	1	0.8						
Survey	51	7	4	2	1	2	3	0.5						
Survey	51	7	4	1	1	2	1	0.1						
Survey	51	8					1							
Survey	52	1	4	2	1	1	1	0.1						
Survey	52	2	4	2	1	2	2	0.2						
Survey	52	3	4	2	1	2	2	0.2						
Survey	52	3	4	2	1	1	1	0.1						
Survey	52	4	4	2	1	1	1	0.4	1	0.1				1.1
Survey	52	4	4	2	1	2	5	0.5						0

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Survey	52	5	4	2	1	2	4	0.6			1	1		1.5
Survey	52	5	4	1	1	2	3	1.4						
Survey	52	5	4	2	1	1	2	0.3						
Survey	52	6	4	2	1	2	1	0.1						
Survey	52	6	4	2	1	1	1	0.1						
Survey	52	6	4	2	3	2	1	0.1						
Survey	53	1	4	1	1	2	1	0.2			1	0		1.1
Survey	53	2	4	2	1	2	1	0.1						
Survey	54	1	4	2	1	2	1	0.1						
Survey	54	3	3	2	1	1	1	0.4						
Survey	54	3	4	2	1	2	2	0.3						
Survey	54	4	4	1	1	2	1	0.2						
Survey	54	5	4	2	1	2	4	0.5						
Survey	54	6	4	1	1	2	2	0.6						
Survey	54	6	4	2	1	2	2	0.2						
Survey	54	7	4	2	1	2	1	0.1			1	0		1.1
Survey	54	8	2	2	1	2	2	3.2						
Survey	54	8	3	2	1	2	3	1.2						
Survey	54	8	2	1	1	2	1	1.4						
Survey	54	9	4	2	1	2	1	0.1						
Survey	54	10	2	2	1	2	1	0.3						
Survey	56	8	4	2	1	2	1	0.1						
Survey	79	3	4	2	1	2	1	0.1						
Survey	79	5	4	2	1	2	3	0.2						
Survey	79	6	4	2	1	2	1	0.1			1	0		1.4
Survey	79	6	3	2	1	2	1	0.4						
Survey	79	7	4	2	1	2	2	0.2						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Survey	80	4	3	1	1	2	1	0.7						
Survey	80	4	4	2	1	2	1	0.1						
Survey	80	6	4	2	1	2	1	0.1						
Survey	80	6	4	2	1	2	2	0.8						
Survey	80	7	4	1	1	2	1	0.2						
Survey	80	7	2	2	1	12	1	1						
Survey	82	2	4	2	1	2	1	0.1						
Survey	82	3	4	2	1	2	1	0.1						
Survey	82	4	4	2	1	2	2	0.4						
Survey	82	4	4	1	1	2	1	0.2						
Survey	82	4	4	2	1	2	1	0.1						
Survey	82	5	4	2	1	2	2	0.1						
Survey	82	6	4	2	1	2	3	0.2						
Survey	82	7	2	2	1	2	1	1.6						
Survey	82	8	4	2	1	2	1	0.1						
Survey	82	9	4	1	1	2	1	0.2			1	2		
Survey	82	9	4	1	1	2	1	0.1						
Survey	84	1	4	2	1	2	2	0.4						
Survey	84	1	4	1	1	2	1	0.4						
Survey	84	2	4	2	1	2	2	0.1						
Survey	84	3	4	2	2	2	1	0.1	1	0.3				1.3
Survey	84	4	2	2	1	2	1	1.5						
Survey	84	4	4	2	1	2	2	0.4						
Survey	84	4	4	1	1	2	1	0.5						
Survey	84	5	4	2	1	2	2	0.2						
Survey	84	6	4	2	1	2	2	0.3						
Testing	1	3	4	1	2	2	1	1.97						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	1	3	4	2	1	2	4	6.6						
Testing	1	4	4	2	1	2	1	0.25						
Testing	1	4	4	2	1	1	1	0.06						
Testing	1	5	4	1	1	2	1	0.03						
Testing	1	5	4	1	1	1	1	0.09						
Testing	1	6	4	1	1	1	1	0.3						
Testing	1	6	4	2	1	1	1	0.6						
Testing	1	7	4	2	1	2	1	0.2						
Testing	1	8	4	2	1	2	3	0.24						
Testing	1	9	4	2	1	2	1	0.3						
Testing	1	10	4	2	1	2	2	0.13						
Testing	2		4	2	1	2	1	0.16						
Testing	2	2	4	2	1	2	1	0.12						
Testing	2	2	4	2	1	2	1	0.13						
Testing	2	2	4	2	1	2	3	0.56						
Testing	2	3	4	1	1	2	3	0.69						
Testing	2	3	4	2	1	2	2	0.09						
Testing	2	3	4	2	1	1	1	0.15						
Testing	2	3	4	2	1	2	1	0.2						
Testing	2	4	4	2	1	1	2	0.25						
Testing	2	4	4	1	1	2	3	2.7						
Testing	2	8	4	1	1	2	2	0.17						
Testing	2	8	4	2	1	2	4	0.51						
Testing	2	8	4	2	1	1	1	0.2						
Testing	2	9	4	2	1	1	2	0.28						
Testing	2	9	4	2	1	2	1	0.33						
Testing	2	10	4	2	1	2	1	0.04						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	2	11	4	2	1	2	2	0.18						
Testing	2	12	4	2	2	2	1	0.08						
Testing	3	Wall Slump	4	2	1	2	2	0.6						
Testing	3	Wall Slump	4	1	1	2	1	0.44						
Testing	3	Wall Slump	4	1	1	1	1	0.56						
Testing	3	1	4	1	1	1	1	0.78						
Testing	3	1	4	1	2	2	1	0.43						
Testing	3	1	4	2	1	2	1	0.05						
Testing	3	1	4	2	1	2	5	0.56						
Testing	3	2	4	1	1	1	3	0.73						
Testing	3	2	4	1	1	1	2	1.67						
Testing	3	2	4	2	1	1	4	0.8						
Testing	3	2	4	2	1	2	15	2.3						
Testing	3	2	4	1	1	2	2	0.21						
Testing	3	2	4	1	1	1	1	0.24						
Testing	3	3	4	1	1	1	2	1.37						
Testing	3	3	4	1	1	2	10	5.71						
Testing	3	3	4	1	1	1	1	0.07						
Testing	3	3	4	2	1	1	1	0.5						
Testing	3	3	4	1	1	1	2	0.99						
Testing	3	3	4	2	1	2	15	9						
Testing	3	3	4	2	1	1					1	0		
Testing	3	3	4	1	1	2	1	0.17						
Testing	3	3	4	2	2	2	7	0.93						
Testing	3	4	3	1	1	2	1	3.87						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	3	4	3	2	1	2	2	4.38						
Testing	3	4	4	1	1	1	7	2.58						
Testing	3	4	4	1	2	1	1	0.31						
Testing	3	4	4	1	1	2	7	4.32						
Testing	3	4	4	1	1	2	3	0.92						
Testing	3	4	4	2	1	2	2	1.04						
Testing	3	4	4	1	1	1	2	0.6						
Testing	3	4	4	1	1	1	1	0.54						
Testing	3	4	4	2	1	2	21	4						
Testing	3	4	4	2	2	2	1	0.19						
Testing	3	4	4	2	1	2	5	0.5						
Testing	3	5	3	2	1	2	1	2.3						
Testing	3	5	4	1	1	2	2	0.73						
Testing	3	5	4	1	1	1	3	0.48						
Testing	3	5	4	1	1	1	2	0.21						
Testing	3	5	4	2	1	1	2	0.2						
Testing	3	5	4	1	1	2	6	2.11						
Testing	3	5	4	2	1	2	16	1.93						
Testing	3	5	4	1	1	2	3	0.91						
Testing	3	5	4	1	1	1	1	0.34						
Testing	3	5	4	2	1	2	8	3.16						
Testing	3	5	4	1	1	2	4	2.28						
Testing	3	5	4	2	2	2	1	0.61						
Testing	3	5	4	2	1	2	2	0.57						
Testing	3	5	4	1	1	1	2	0.51						
Testing	3	5	4	2	1	1	1	0.22						
Testing	3	5	4	2	1	2	3	0.46						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	3	6	3	1	1	1	1	1.29						
Testing	3	6	3	1	1	2	3	6.59						
Testing	3	6	3	2	1	2	2	2.41						
Testing	3	6	4	1	1	1	10	4						
Testing	3	6	4	1	1	2	5	2.65						
Testing	3	6	4	1	1	2	15	11.07						
Testing	3	6	4	1	1	1	1	0.07						
Testing	3	6	4	2	1	1	5	1.26						
Testing	3	6	4	1	1	2	1	0.27						
Testing	3	6	4	2	1	2	8	1.77						
Testing	3	6	4	2	1	2	36	8.74						
Testing	3	6	4	1	1	1	3	1.79						
Testing	3	6	4	2	1	1	4	2.41						
Testing	3	6	4	1	1	2	3	1.18						
Testing	3	6	4	2	2	2	2	0.84						
Testing	3	6	4	2	1	1	1	0.12						
Testing	3	6	4	2	1	2	2	0.85						
Testing	3	7	3	1	1	1	2	4.5						
Testing	3	7	3	1	1	2	5	18.32						
Testing	3	7	3	2	1	2	6	14.86						
Testing	3	7	3	1	1	2	1	4.42						
Testing	3	7	4	1	1	1	3	2.15						
Testing	3	7	4	2	1	2	28	9.79						
Testing	3	7	4	1	1	2	1	0.1						
Testing	3	7	4	1	1	2	8	5.94						
Testing	3	7	4	1	1	1	1	0.06						
Testing	3	7	4	2	2	2	2	0.84						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	3	7	4	2	1	2	3	0.56						
Testing	3	7	4	1	1	2	1	0.29						
Testing	3	8	3	2	1	2	2	4.78						
Testing	3	8	4	1	1	1	4	5.25						
Testing	3	8	4	1	1	2	10	6.23						
Testing	3	8	4	2	1	1	6	3.1						
Testing	3	8	4	2	1	2	8	2.21						
Testing	3	8	4	1	2	2	1	1.26						
Testing	3	8	4	2	1	2	3	0.93						
Testing	3	9	3	1	1	2	1	5.07						
Testing	3	9	4	1	1	2	2	3.82						
Testing	3	9	4	2	1	2	1	0.09						
Testing	4	1	4	1	1	2	2	0.23						
Testing	4	1	4	2	1	2	8	0.96						
Testing	4	2	4	1	1	1	1	0.16						
Testing	4	2	4	1	1	2	3	0.74						
Testing	4	2	4	2	1	1	1	0.11						
Testing	4	2	4	2	1	2	2	0.18						
Testing	4	2	4	2	1	2	5	1.05						
Testing	4	2	4	2	1	2	2	0.37						
Testing	4	3	4	1	1	1	4	1.41						
Testing	4	3	4	1	1	2	1	0.22						
Testing	4	3	4	1	1	2	6	1.31						
Testing	4	3	4	1	2	2	1	0.15						
Testing	4	3	4	1	1	2	1	0.22						
Testing	4	3	4	2	1	1	1	0.18						
Testing	4	3	4	1	1	1	2	0.19						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	3	4	1	1	2	4	0.35						
Testing	4	3	4	2	1	2	6	0.56						
Testing	4	3	4	2	1	2	16	1.77						
Testing	4	3	4	1	1	2	1	0.23						
Testing	4	3	4	2	2	2	3	0.82						
Testing	4	3	4	2	1	2	1	0.17						
Testing	4	3	4	2	1	1	1	0.06						
Testing	4	4	4	2	1	2	1	0.29						
Testing	4	4	4	1	1	1	2	0.43						
Testing	4	4	4	1	1	2	4	0.86						
Testing	4	4	4	2	1	2	1	0.36						
Testing	4	4	4	1	2	2	2	0.36						
Testing	4	4	4	2	1	1	1	0.13						
Testing	4	4	4	2	1	2	5	0.53						
Testing	4	4	4	1	1	2	1	0.09						
Testing	4	4	4	2	1	2	18	1.42						
Testing	4	4	4	1	1	2	1	0.1						
Testing	4	4	4	2	2	2	3	0.26						
Testing	4	4	4	2	1	1	2	0.11						
Testing	4	4	4	2	1	1	2	0.24						
Testing	4	5	4	1	1	1	5	1.17						
Testing	4	5	4	1	1	2	1	0.13						
Testing	4	5	4	1	1	1	1	0.37						
Testing	4	5	4	2	1	1	1	0.18						
Testing	4	5	4	2	1	2	3	0.56						
Testing	4	5	4	2	2	2	2	0.33						
Testing	4	5	4	1	1	1	1	0.17						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	5	4	2	1	2	10	0.99						
Testing	4	5	4	2	1	1	1	0.04						
Testing	4	6	3	1	1	2	1	7.41						
Testing	4	6	4	1	1	1	7	2.67						
Testing	4	6	4	1	1	2	7	1.61						
Testing	4	6	4	1	2	1	2	0.44						
Testing	4	6	4	2	1	1	6	1.36						
Testing	4	6	4	2	2	1	1	0.26						
Testing	4	6	4	1	1	2	2	0.43						
Testing	4	6	4	2	1	2	2	0.76						
Testing	4	6	4	1	1	2			1	0.5				
Testing	4	1	4	1	1	2	2	0.23						
Testing	4	1	4	2	1	2	8	0.96						
Testing	4	2	4	1	1	1	1	0.16						
Testing	4	2	4	1	1	2	3	0.74						
Testing	4	2	4	2	1	1	1	0.11						
Testing	4	2	4	2	1	2	2	0.18						
Testing	4	2	4	2	1	2	5	1.05						
Testing	4	2	4	2	1	2	2	0.37						
Testing	4	3	4	1	1	1	4	1.41						
Testing	4	3	4	1	1	2	1	0.22						
Testing	4	3	4	1	1	2	6	1.31						
Testing	4	3	4	1	2	2	1	0.15						
Testing	4	3	4	1	1	2	1	0.22						
Testing	4	3	4	2	1	1	1	0.18						
Testing	4	3	4	1	1	1	2	0.19						
Testing	4	3	4	1	1	2	4	0.35						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	3	4	2	1	2	6	0.56						
Testing	4	3	4	2	1	2	16	1.77						
Testing	4	3	4	1	1	2	1	0.23						
Testing	4	3	4	2	2	2	3	0.82						
Testing	4	3	4	2	1	2	1	0.17						
Testing	4	3	4	2	1	1	1	0.06						
Testing	4	4	4	2	1	2	1	0.29						
Testing	4	4	4	1	1	1	2	0.43						
Testing	4	4	4	1	1	2	4	0.86						
Testing	4	4	4	2	1	2	1	0.36						
Testing	4	4	4	1	2	2	2	0.36						
Testing	4	4	4	2	1	1	1	0.13						
Testing	4	4	4	2	1	2	5	0.53						
Testing	4	4	4	1	1	2	1	0.09						
Testing	4	4	4	2	1	2	18	1.42						
Testing	4	4	4	1	1	2	1	0.1						
Testing	4	4	4	2	2	2	3	0.26						
Testing	4	4	4	2	1	1	2	0.11						
Testing	4	4	4	2	1	1	2	0.24						
Testing	4	5	4	1	1	1	5	1.17						
Testing	4	5	4	1	1	2	1	0.13						
Testing	4	5	4	1	1	1	1	0.37						
Testing	4	5	4	2	1	1	1	0.18						
Testing	4	5	4	2	1	2	3	0.56						
Testing	4	5	4	2	2	2	2	0.33						
Testing	4	5	4	1	1	1	1	0.17						
Testing	4	5	4	2	1	2	10	0.99						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	5	4	2	1	1	1	0.04						
Testing	4	6	3	1	1	2	1	7.41						
Testing	4	6	4	1	1	1	7	2.67						
Testing	4	6	4	1	1	2	7	1.61						
Testing	4	6	4	1	2	1	2	0.44						
Testing	4	6	4	2	1	1	6	1.36						
Testing	4	6	4	2	2	1	1	0.26						
Testing	4	6	4	1	1	2	2	0.43						
Testing	4	6	4	2	1	2	2	0.76						
Testing	4	6	4	1	1	2			1	0.5				
Testing	4	6	4	1	2	2	1	1.51						
Testing	4	6	4	2	2	2	3	0.25						
Testing	4	6	4	2	1	1	3	0.4						
Testing	4	6	4	1	1	2	7	1.06						
Testing	4	6	4	2	1	2	31	5.1						
Testing	4	6	4	2	2	2	4	0.89						
Testing	4	6	4	2	2	1	1	0.4						
Testing	4	6	4	2	1	2	4	1.18						
Testing	4	6	4	1	1	1	1	1						
Testing	4	6	4	1	1	2	2	0.67						
Testing	4	6	4	2	1	1					1	1		
Testing	4	6	4	2	1	1	1	0.74						
Testing	4	7	3	2	1	1	1	1						
Testing	4	7	3	2	2	2	1	1.14						
Testing	4	7	4	1	1	1	3	0.55						
Testing	4	7	4	1	1	2	6	3.05						
Testing	4	7	4	1	2	2	1	0.13						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	7	4	1	1	1	2	0.65						
Testing	4	7	4	2	1	1	5	0.94						
Testing	4	7	4	2	2	2	1	0.09						
Testing	4	7	4	1	1	1	2	0.82						
Testing	4	7	4	2	1	2	1	0.1						
Testing	4	7	4	2	1	2	27	3.81						
Testing	4	7	4	2	2	2	1	0.04						
Testing	4	7	4	2	1	1	2	0.34						
Testing	4	7	4	1	1	2	1	0.26						
Testing	4	7	4	2	2	2	4	1.76						
Testing	4	7	4	1	2	2	1	0.31						
Testing	4	8	3	2	1	2	1	1.77						
Testing	4	8	4	1	1	1	4	2.61						
Testing	4	8	4	1	1	2	5	2.83						
Testing	4	8	4	1	2	2	1	2.22						
Testing	4	8	4	2	1	2	5	1.46						
Testing	4	8	4	1	1	2	2	0.33						
Testing	4	8	4	2	2	2	2	0.15						
Testing	4	9	3	2	1	1	1	1.55						
Testing	4	9	3	1	1	1	1	1.92						
Testing	4	9	3	1	1	2	3	10.05						
Testing	4	9	4	2	1	1	4	0.69						
Testing	4	9	4	1	1	1	1	1						
Testing	4	9	4	2	1	2	6	4.3						
Testing	4	9	4	1	1	2	3	2.44						
Testing	4	9	4	2	2	2	4	0.84						
Testing	4	9	4	2	1	1	1	0.08						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Testing	4	1	4	2	1	2	6	2.25						
Testing	4	10	4	2	1	1	1	0.07						
Testing	4	10	4	1	1	2	1	0.06						
Testing	4	10	3	2	1	2	1	1.1						
Testing	4	10	3	1	2	2	2	3.86						
Testing	4	10	4	1	1	1	5	3.76						
Testing	4	10	4	2	1	1	1	0.16						
Testing	4	10	4	2	1	1	3	0.22						
Testing	4	10	4	2	2	2	2	2.9						
Testing	4	10	4	1	1	2	2	1.56						
Testing	4	10	4	2	1	2	1	0.09						
Testing	4	10	4	2	1	1	1	0.17						
Testing	4	11	4	1	1	1	2	3						
Testing	4	11	4	1	1	2	1	1.67						
Testing	4	11	4	2	1	2	3	0.7						
Testing	4	12	4	1	1	2	1	1.18						
Data R.	5	1	4	1	1	3	1	0.1						
Data R.	5	1	4	1	1	2	3	1.28						
Data R.	5	1	4	2	1	2	12	2						
Data R.	5	2	4	1	1	2	2	0.6						
Data R.	5	2	4	2	1	2	3	0.83						
Data R.	5	2	4	2	1	1	1	0.5						
Data R.	5	3	3	2	1	2	1	1.2						
Data R.	5	3	4	1	1	2	9	3.66						
Data R.	5	3	4	1	1	1	4	1.73						
Data R.	5	3	4	2	1	2	30	7.4						
Data R.	5	3	4	2	1	1					1	0		

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	5	3	4	2	1	1	2	0.28						
Data R.	5	3	4	1	1	1	2	0.2						
Data R.	5	3	3	1	1	2		4.74						
Data R.	5	4	2	1	1	2	1	5.1						
Data R.	5	4	3	1	1	2	1	1.5						
Data R.	5	4	4	1	1	1	3	0.78						
Data R.	5	4	4	1	1	3	1	0.4						
Data R.	5	4	4	2	1	2	36	8.05						
Data R.	5	4	4	2	1	1	12	2.81						
Data R.	5	4	4	2	2	2	3	0.35						
Data R.	5	4	4	2	1	1	1	1.4						
Data R.	5	4	4	2	2	2	2	1.3						
Data R.	5	5	2	1	1	2	1	4.4						
Data R.	5	5	3	1	1	2	1	4.4						
Data R.	5	5	4	1	1	2	16	10.48						
Data R.	5	5	4	1	1	1	4	1.78						
Data R.	5	5	4	1	2	2	1	0.1						
Data R.	5	5	4	2	1	2	43	11.28						
Data R.	5	5	4	2	2	2	5	1.83						
Data R.	5	5	4	1	1	2	3	0.52						
Data R.	5	5	4	2	1	1	9	1.41						
Data R.	5	5	4	2	2	2	1	0.1						
Data R.	5	6	2	1	1	2	1	6.7						
Data R.	5	6	3	1	1	1					1	3		
Data R.	5	6	3	1	1	2	1	2						
Data R.	5	6	3	2	1	2	1	1.6						
Data R.	5	6	4	1	1	2	14	9.76						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	5	6	4	1	1	1	3	0.93						
Data R.	5	6	4	1	1	2	2	1.64						
Data R.	5	6	4	2	1	2	14	4.85						
Data R.	5	6	4	2	1	1	7	0.68						
Data R.	5	6	4	2	1	2	1	0.1						
Data R.	5	7	3	1	1	2	4	13.4						
Data R.	5	7	3	2	1	2	3	11.3						
Data R.	5	7	4	1	1	2	7	5.17						
Data R.	5	7	4	1	2	2	2	1.79						
Data R.	5	7	4	1	1	1	4	3.21						
Data R.	5	7	4	2	1	2	13	5.15						
Data R.	5	7	4	2	1	1	2	1.24						
Data R.	5	7	4	2	1	1	1	0.07						
Data R.	5	8	4	1	1	2	7	9.27						
Data R.	5	8	4	1	2	2	1	2.14						
Data R.	5	8	4	1	1	1	1	1.41						
Data R.	5	8	4	1	1	2	1	0.2						
Data R.	5	8	4	1	1	1	1	1.28						
Data R.	5	8	4	2	1	2	2	0.33						
Data R.	5	8	4	1	1	2	1	0.21						
Data R.	5	8	4	2	1	1	2	1.29						
Data R.	5	9	4	1	1	2	2	2.2						
Data R.	5	9	4	2	1	1	2	1						
Data R.	5	10	3	1	1	2	1	4.7						
Data R.	5	11	4	2	1	2	3	1.1						
Data R.	6	1	1	1	1	2	1	21.97						
Data R.	6	1	4	1	1	2			1	0.6				

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	6	1	4	1	1	1					1	0		
Data R.	6	1	4	1	1	2	3	1.1						
Data R.	6	1	4	2	1	2	1	0.3						
Data R.	6	2	4	2	1	2	1	0.2						
Data R.	6	2	4	2	1	3	1	0.1						
Data R.	6	3	4	1	1	2	11	3.68						
Data R.	6	3	4	1	1	1	3	0.78						
Data R.	6	3	4	2	1	2	24	5.56						
Data R.	6	3	4	1	1	2	4	0.86						
Data R.	6	3	4	2	2	2	1	0.64						
Data R.	6	3	4	2	1	1	6	1.2						
Data R.	6	3	4	2	2	2	1	0.1						
Data R.	6	4	4	1	1	2	27	14.04						
Data R.	6	4	4	1	1	1	2	0.93						
Data R.	6	4	4	1	1	1	3	0.6						
Data R.	6	4	4	2	1	2	74	16.85						
Data R.	6	4	4	2	1	1	4	0.53						
Data R.	6	4	4	1	1	2	4	1.53						
Data R.	6	4	4	2	2	2	2	0.29						
Data R.	6	4	4	2	1	3	2	1.48						
Data R.	6	4	4	2	1	1	4	0.7						
Data R.	6	4	4	1	1	3	1	1.02						
Data R.	6	4	4	2	2	2	1	0.5						
Data R.	6	5	3	1	1	2	3	7.9						
Data R.	6	5	3	1	1	1	1	1.6						
Data R.	6	5	3	2	1	2	1	0.7						
Data R.	6	5	3	1	2	1	1	3						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	6	5	4	1	1	2	20	16.24						
Data R.	6	5	4	1	1	1	3	1.64						
Data R.	6	5	4	1	1	1	7	4.6						
Data R.	6	5	4	2	1	1	5	1.3						
Data R.	6	5	4	1	1	1	2	0.27						
Data R.	6	5	4	2	1	2	35	8.1						
Data R.	6	6	3	1	1	2	2	5.5						
Data R.	6	6	3	1	1	2	1	3.6						
Data R.	6	6	4	1	1	1	3	0.9						
Data R.	6	6	4	1	1	2	13	10.5						
Data R.	6	6	4	1	2	2	1	1.4						
Data R.	6	6	4	2	1	1	2	0.1						
Data R.	6	6	4	2	1	2	16	4.68						
Data R.	6	6	4	2	1	1	3	0.39						
Data R.	6	7	2	1	1	2	2	17.6						
Data R.	6	7	3	1	1	2	2	5.5						
Data R.	6	7	3	2	1	2	1	1.2						
Data R.	6	7	4	1	1	2	10	8.4						
Data R.	6	7	4	2	1	2	8	2.5						
Data R.	6	9	4	1	1	1	1	0.1						
Data R.	7	1	4	1	1	2	8	6.5						
Data R.	7	1	4	2	1	2	9	4.15						
Data R.	7	1	4	1	1	2			1	0.3				
Data R.	7	1	4	1	1	1	1	0.42						
Data R.	7	2	3	1	1	2	1	1.1						
Data R.	7	2	4	1	1	2	12	4.5						
Data R.	7	2	4	2	1	2	10	1						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	7	2	4	2	1	1	3	0.87						
Data R.	7	3	4	1	1	2	14	5.56						
Data R.	7	3	4	2	1	2	1	0.1						
Data R.	7	3	4	1	1	1	3	0.55						
Data R.	7	3	4	2	1	2	27	5.55						
Data R.	7	3	4	1	1	2	2	0.97						
Data R.	7	3	4	2	1	1	5	0.42						
Data R.	7	4	3	1	1	2	3	9.5						
Data R.	7	4	3	2	1	2	1	0.9						
Data R.	7	4	4	1	1	1	1	0.1						
Data R.	7	4	4	1	1	2	17	8.02						
Data R.	7	4	4	1	1	1	1	0.51						
Data R.	7	4	4	2	1	1	1	0.2						
Data R.	7	4	4	2	1	2	44	11.96						
Data R.	7	4	4	1	1	2	2	0.46						
Data R.	7	4	4	2	1	1	2	0.61						
Data R.	7	5	3	1	1	2	3	6.6						
Data R.	7	5	3	1	2	2	1	3.6						
Data R.	7	5	3	2	1	2	1	0.6						
Data R.	7	5	3	2	2	1	1	1.8						
Data R.	7	5	4	1	1	2	18	14.45						
Data R.	7	5	4	1	1	1	2	1.47						
Data R.	7	5	4	1	2	2	1	0.6						
Data R.	7	5	4	2	1	1	3	0.9						
Data R.	7	6	3	1	1	2	3	8.8						
Data R.	7	6	4	1	1	2	13	12.94						
Data R.	7	6	4	1	1	2			1	1.4				

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	7	6	4	1	1	1					1	1		
Data R.	7	6	4	2	1	1	4	0.7						
Data R.	7	6	3	2	1	2	2	5.1						
Data R.	7	6	4	2	1	2	24	9.88						
Data R.	7	6	4	2	1	1	1	0.55						
Data R.	7	6	4	1	1	2	1	0.39						
Data R.	7	6	4	2	2	2	1	0.51						
Data R.	7	7	3	1	1	2	3	7.4						
Data R.	8	1	4	2	1	2	5	1.1						
Data R.	8	1	4	1	1	2	5	3.1						
Data R.	8	1	3	1	1	2	1	3.3						
Data R.	8	2	4	1	1	2	6	3.22						
Data R.	8	2	4	1	1	1	2	0.64						
Data R.	8	2	4	2	1	1	1	0.1						
Data R.	8	2	4	2	1	2	10	2.3						
Data R.	8	2	4	1	1	2	1	0.3						
Data R.	8	3	4	1	1	1	5	1.1						
Data R.	8	3	4	1	1	2	30	14.8						
Data R.	8	3	4	2	1	2	57	10.98						
Data R.	8	3	4	2	1	1	9	1.96						
Data R.	8	3	4	2	2	2	1	0.46						
Data R.	8	3	4	1	1	2	2	0.28						
Data R.	8	3	4	2	2	2	1	0.1						
Data R.	8	3	4	2	1	1	1	0.07						
Data R.	8	3	4	2	1	2	5	8.53						
Data R.	8	4	3	1	1	2	2	4.5						
Data R.	8	4	3	2	1	2	1	6						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	8	4	4	1	1	1	5	2.4						
Data R.	8	4	4	1	1	2	15	9.5						
Data R.	8	4	4	2	1	2	49	11.53						
Data R.	8	4	4	2	1	1	3	0.46						
Data R.	8	4	4	2	2	2	3	0.4						
Data R.	8	5	4	2	3	2	1	0.2						
Data R.	8	5	4	1	1	1	4	2.1						
Data R.	8	5	4	1	1	1	4	2.1						
Data R.	8	5	4	1	1	2	22	16.1						
Data R.	8	5	4	2	1	1	6	1.6						
Data R.	8	5	3	2	1	1	1	2.5						
Data R.	8	5	3	1	1	2	4	14.3						
Data R.	8	6	3	1	1	1	1	2.1						
Data R.	8	6	3	1	1	2	3	8.1						
Data R.	8	6	3	2	1	1					1	8		
Data R.	8	6	4	1	1	1	5	1.3						
Data R.	8	6	4	1	1	2	12	9.5						
Data R.	8	6	4	2	1	1	4	1						
Data R.	8	6	4	2	1	2	11	4.49						
Data R.	8	6	4	2	1	1	4	1.17						
Data R.	8	6	4	2	2	2	1	0.72						
Data R.	8	6	4	2	1	2	3	0.28						
Data R.	8	7	4	1	1	2	2	1.1						
Data R.	8	7	3	1	1	2	1	2.1						
Data R.	9	1	4	2	1	2	4	1.11						
Data R.	9	1	4	1	1	2	1	0.3						
Data R.	9	1	4	1	1	1	1	0.25						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	9	1	4	2	1	1	2	0.9						
Data R.	9	1	4	1	1	2	3	1.3						
Data R.	9	2	4	1	1	2	2	1.1						
Data R.	9	2	3	1	1	2	1	0.3						
Data R.	9	2	4	2	1	2	4	0.3						
Data R.	9	3	3	1	1	2	1	1.3						
Data R.	9	3	4	1	1	1	2	1.2						
Data R.	9	3	4	1	1	2	17	7.3						
Data R.	9	3	4	1	1	2	2	0.8						
Data R.	9	3	4	2	1	2	33	3.88						
Data R.	9	3	4	2	1	1	4	0.49						
Data R.	9	3	4	2	2	2	2	0.1						
Data R.	9	4	4	2	3	2	1	0.2						
Data R.	9	4	4	1	2	2	1	0.4						
Data R.	9	4	4	1	1	1	5	2.1						
Data R.	9	4	4	1	1	2	22	20.2						
Data R.	9	4	4	2	1	1	8	1.3						
Data R.	9	4	4	2	1	2	31	11.1						
Data R.	9	4	4	2	2	2	9	4.7						
Data R.	9	5	3	1	1	2	4	11.3						
Data R.	9	5	3	2	1	2	3	5.64						
Data R.	9	5	3	2	2	2	1	2						
Data R.	9	5	3	1	1	2	1	1.2						
Data R.	9	5	4	1	1	1	7	2.8						
Data R.	9	5	4	1	1	2	13	6.26						
Data R.	9	5	4	1	1	1	1	1.02						
Data R.	9	5	4	1	1	1					1	2		

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	9	5	4	1	1	2	2	3.3						
Data R.	9	5	4	2	1	1	7	1.1						
Data R.	9	5	4	2	1	2	27	9						
Data R.	9	5	4	2	2	2	3	0.5						
Data R.	9	6	4	1	1	1	5	5.1						
Data R.	9	6	4	1	1	2	3	3.2						
Data R.	9	6	4	1	3	2	1	1.2						
Data R.	9	6	4	2	1	2	8							
Data R.	9	6	4	1	1	2	2	0.52						
Data R.	9	6	4	1	1	1	2	0.9						
Data R.	9	6	4	2	1	2	8	7.2						
Data R.	9	6	4	2	2	2	3	2.5						
Data R.	9	7	4	2	1	1					1	0		
Data R.	9	7	4	1	1	2	1	1.3						
Data R.	10	1	4	1	1	2	2	0.5						
Data R.	10	1	4	2	1	2	2	0.3						
Data R.	10	1	4	1	1	2	2	0.5						
Data R.	10	2	4	1	1	1	1	0.2						
Data R.	10	2	4	1	1	2	1	0.8						
Data R.	10	2	4	2	1	1	3	0.7						
Data R.	10	3	3	1	1	2	3	8.3						
Data R.	10	3	4	1	1	2	9	6.2						
Data R.	10	3	4	1	1	1	1	0.1						
Data R.	10	3	4	1	1	2	5	1.9						
Data R.	10	3	4	2	1	2	4	0.2						
Data R.	10	3	4	2	1	2	2	1.1						
Data R.	10	3	4	2	1	2	24	5.2						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	10	3	4	2	1	1	1	0.2						
Data R.	10	4	4	2	1	2	42	9.3						
Data R.	10	4	4	1	2	2	1	0.1						
Data R.	10	4	4	1	1	2	4	1.1						
Data R.	10	4	4	2	1	1	4	1.1						
Data R.	10	4	4	1	1	1	1	0.1						
Data R.	10	4	4	1	1	2	24	10.1						
Data R.	10	4	4	1	1	1					2	2		
Data R.	10	4	3	2	1	2	1	2.2						
Data R.	10	4	3	1	1	2	2	5.2						
Data R.	10	5	4	2	1	2	45	10.4						
Data R.	10	5	4	2	2	2	3	0.6						
Data R.	10	5	4	1	1	2	6	2.3						
Data R.	10	5	4	1	1	2	16	8.3						
Data R.	10	5	4	1	1	1	1	0.2						
Data R.	10	5	4	1	1	1	6	3.2						
Data R.	10	5	3	1	1	2	3	6.2						
Data R.	10	5	2	1	1	2	1	5.9						
Data R.	10	5	3	1	2	2	1	4.3						
Data R.	10	5	4	2	1	1	8	1.6						
Data R.	10	5	3	2	1	2	2	4						
Data R.	10	5	3	1	2	2	1	6						
Data R.	10	6	3	1	1	2	7	22.5					1	31.5
Data R.	10	6	4	1	1	1					1	2		
Data R.	10	6	4	1	1	2			1	0.9				
Data R.	10	6	4	1	1	2	18	19						
Data R.	10	6	4	2	1	2	14	8.4						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	10	6	4	1	1	2	4	2.4						
Data R.	10	6	4	1	1	1	2	0.5						
Data R.	10	7	3	1	1	2	2	9.1						
Data R.	10	7	4	1	1	1	1	0.9						
Data R.	10	7	4	1	1	2	3	2.6						
Data R.	10	7	4	2	1	2	1	0.1						
Data R.	10	7	4	2	1	2	2	1.2						
Data R.	10	7	4	1	1	2	1	0.2						
Data R.	10	7	4	2	1	1	1	0.3						
Data R.	11	1	4	2	1	2	8	1.28						
Data R.	11	1	4	1	1	2	1	0.16						
Data R.	11	1	4	2	1	1	4	1.08						
Data R.	11	1	4	2	1	1	2	0.2						
Data R.	11	1	4	1	2	1	1	0.13						
Data R.	11	1	4	2	2	1	1	0.41						
Data R.	11	1	4	2	1	2	1	0.13						
Data R.	11	1	4	1	1	2	6	1.6						
Data R.	11	2	4	2	1	1	2	0.4						
Data R.	11	2	4	2	1	2	4	0.8						
Data R.	11	3	3	1	1	2	3	6.9						
Data R.	11	3	3	2	1	2	1	1.5						
Data R.	11	3	4	1	1	2	9	7.1						
Data R.	11	3	4	1	2	2	2	1.8						
Data R.	11	3	4	2	1	1	1	0.3						
Data R.	11	3	4	2	1	2	2	0.2						
Data R.	11	3	4	2	1	2	15	5.53						
Data R.	11	3	4	2	1	1	2	0.38						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	11	3	4	1	1	2	3	0.98						
Data R.	11	3	4	2	4	2	1	0.2						
Data R.	11	4	2	2	1	2	1	4.3						
Data R.	11	4	3	1	1	2	6	3.2						
Data R.	11	4	3	2	1	2	2	4.25						
Data R.	11	4	3	1	1	2	1	2.84						
Data R.	11	4	4	1	1	1	2	1.8						
Data R.	11	4	4	1	1	2	16	16.82						
Data R.	11	4	4	1	1	1	2	2.18						
Data R.	11	4	4	1	1	1					1	1		
Data R.	11	4	4	2	1	2	28	9.6						
Data R.	11	4	4	2	1	1	6	1.29						
Data R.	11	4	4	2	1	2	1	1.2						
Data R.	11	4	4	2	2	1	1	0.6						
Data R.	11	5	2	1	1	2	1	6.5						
Data R.	11	5	2	2	1	2	1	2.1						
Data R.	11	5	3	1	1	2	2	10.49						
Data R.	11	5	3	2	1	2	1	2.27						
Data R.	11	5	3	2	1	1	1	1.47						
Data R.	11	5	4	1	1	1	1	0.1						
Data R.	11	5	4	1	1	2			1	0.6				
Data R.	11	5	4	1	1	1					1	1		
Data R.	11	5	4	1	2	2	1	0.13						
Data R.	11	5	4	1	2	1	2	2.64						
Data R.	11	5	4	1	1	2	11	10.3						
Data R.	11	5	4	2	1	1	2	1.58						
Data R.	11	5	4	1	1	1	4	2.48						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	11	5	4	2	1	2	23	8.96						
Data R.	11	5	4	1	1	2	12	6.45						
Data R.	11	5	4	1	1	1	2	0.49						
Data R.	11	5	4	2	1	1	2	0.42						
Data R.	11	6	1	1	1	1	1	17.7						
Data R.	11	6	2	1	1	2	1	3.7						
Data R.	11	6	2	1	1	2	1	11.79						
Data R.	11	6	2	1	1	1	1	5.4						
Data R.	11	6	2	1	1	1	1	10.7						
Data R.	11	6	3	1	1	2	5	12.7						
Data R.	11	6	3	2	1	2	3	4.36						
Data R.	11	6	3	1	1	2	1	1.38						
Data R.	11	6	4	1	1	1	1	0.1						
Data R.	11	6	4	1	1	2	15	9.01						
Data R.	11	6	4	1	1	1	5	4.02						
Data R.	11	6	4	1	2	2	2	1.5						
Data R.	11	6	4	2	1	2	30	13.12						
Data R.	11	6	4	1	1	2	6	3.33						
Data R.	11	6	4	1	1	1	1	1.45						
Data R.	11	6	4	2	1	1	5	1.62						
Data R.	11	6	4	2	2	1	4	3.2						
Data R.	11	7	2	1	1	2	1	20.9						
Data R.	11	7	3	1	1	2	2	5.9						
Data R.	11	7	4	1	1	1	1	1.4						
Data R.	11	7	4	1	1	2	8	6.6						
Data R.	11	7	4	2	1	2	12	5.37						
Data R.	11	7	4	1	1	2	3	0.57						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	11	8	4	2	1	2	2	2.4						
Data R.	11	9	3	1	1	1	1	5.3						
Data R.	11	9	4	2	1	2	2	0.5						
Data R.	11	9	4	1	1	2	1	1.1						
Data R.	11	11	4	1	1	2	1	0.2						
Data R.	11	13	4	1	1	2	1	1.4						
Data R.	11	13	4	2	1	2	1	0.1						
Data R.	11	14	4	1	1	2	1	0.8						
Data R.	11	14	4	2	1	2	2	1.4						
Data R.	12	1	4	1	1	1	1	0.2						
Data R.	12	1	4	1	1	2	7	2.19						
Data R.	12	1	4	1	1	1	1	0.98						
Data R.	12	1	4	2	1	2	16	2.5						
Data R.	12	2	4	1	1	1	1	0.2						
Data R.	12	2	4	1	1	2	1	0.5						
Data R.	12	2	4	2	1	2	5	0.9						
Data R.	12	2	4	1	1	2	1	0.33						
Data R.	12	3	3	1	1	2	2	5.37						
Data R.	12	3	3	1	1	1	1	2.49						
Data R.	12	3	3	2	1	2	2	3.3						
Data R.	12	3	4	1	1	2	18	8.9						
Data R.	12	3	4	1	1	2	3	1.53						
Data R.	12	3	4	1	1	1	1	0.18						
Data R.	12	3	4	2	1	2	23	9.4						
Data R.	12	3	4	2	2	2	1	0.1						
Data R.	12	4	1	1	2	2	1	18.3						
Data R.	12	4	3	1	1	2	5	16.75						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	12	4	3	1	1	1	1	2.15						
Data R.	12	4	3	2	1	2	1	4.7						
Data R.	12	4	4	1	1	2	25	19.3						
Data R.	12	4	4	1	1	3	3	1.5						
Data R.	12	4	4	1	2	2	1	0.19						
Data R.	12	4	4	1	1	2	2	0.57						
Data R.	12	4	4	2	1	1	3	1.8						
Data R.	12	4	4	2	1	2	22	11.39						
Data R.	12	4	4	1	1	2	2	0.82						
Data R.	12	4	4	1	1	1	1	0.14						
Data R.	12	4	4	2	1	1	2	0.4						
Data R.	12	4	4	2	2	2	4	1.2						
Data R.	12	5	3	1	1	2	2	9.3						
Data R.	12	5	3	1	1	2	2	3.3						
Data R.	12	5	3	2	1	2	2	2.1						
Data R.	12	5	4	1	1	1	2	1.2						
Data R.	12	5	4	1	1	2	14	9.4						
Data R.	12	5	4	1	2	2	6	3.8						
Data R.	12	5	4	2	1	1	4	0.7						
Data R.	12	5	4	2	1	2	24	7.5						
Data R.	12	6	3	1	1	2	2	8.3						
Data R.	12	6	2	2	1	2	2	3.2						
Data R.	12	6	4	1	1	1	1	1.7						
Data R.	12	6	4	1	1	2	15	15.65						
Data R.	12	6	4	1	1	1	1	1.07						
Data R.	12	6	4	2	1	1	4	1.7						
Data R.	12	6	41	1	1	1	2	1.18						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	12	6	4	2	1	2	18	6.6						
Data R.	12	6	4	2	1	1	1	0.21						
Data R.	12	6	4	1	1	2	5	2.49						
Data R.	12	6	4	2	2	2	3	0.9						
Data R.	12	7	3	1	1	2	2	5.2						
Data R.	12	7	4	1	1	1	2	1.8						
Data R.	12	7	4	1	1	2	16	5.7						
Data R.	12	7	4	2	1	2	7	2.67						
Data R.	12	7	4	2	1	1	1	1.23						
Data R.	12	7	4	2	1	1	1	0.1						
Data R.	12	8	3	1	1	2	1	3.1						
Data R.	12	8	4	2	1	2	1	0.2						
Data R.	13	1	4	1	1	1	2	0.5						
Data R.	13	1	4	1	1	2	5	2.1						
Data R.	13	1	4	2	1	2	9	1.97						
Data R.	13	1	4	1	1	2	1	0.16						
Data R.	13	2	4	1	1	2	4	0.9						
Data R.	13	2	4	2	1	2	5	1.1						
Data R.	13	2	4	1	2	2	1	0.07						
Data R.	13	2	4	2	3	2	1	0.1						
Data R.	13	3	4	1	1	1	1	0.4						
Data R.	13	3	4	1	1	2	5	2.9						
Data R.	13	3	4	2	1	1	2	0.3						
Data R.	13	3	4	2	1	2	16	2.68						
Data R.	13	3	4	1	1	2	1	0.07						
Data R.	13	3	4	2	1	1	6	0.91						
Data R.	13	3	4	2	2	2	1	1.09						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	13	3	4	1	1	2	1	0.15						
Data R.	13	3	4	2	1	2	3	0.36						
Data R.	13	4	4	1	1	1	2	0.5						
Data R.	13	4	4	1	1	2	16	9.4						
Data R.	13	4	4	2	1	1	1	0.35						
Data R.	13	4	4	1	1	1	1	0.34						
Data R.	13	4	4	2	1	2	30	7.99						
Data R.	13	4	4	1	1	2	5	1.28						
Data R.	13	4	4	2	1	1	5	1.04						
Data R.	13	4	4	2	2	2	1	0.12						
Data R.	13	4	4	2	1	2	1	0.06						
Data R.	13	5	3	1	1	2	1	1.5						
Data R.	13	5	3	1	2	2	1	2.2						
Data R.	13	5	3	2	1	2	3	4.8						
Data R.	13	5	4	1	1	1	3	0.75						
Data R.	13	5	4	1	1	2	1	0.06						
Data R.	13	5	4	1	1	2	12	10.6						
Data R.	13	5	4	2	1	1	3	0.8						
Data R.	13	5	4	2	1	2	29	8.01						
Data R.	13	5	4	1	1	2	2	0.35						
Data R.	13	6	3	1	1	2	3	12.5						
Data R.	13	6	3	2	1	2	7	14.3						
Data R.	13	6	4	1	1	1	7	5.8						
Data R.	13	6	4	1	1	2	20	14.04						
Data R.	13	6	4	1	1	1	1	0.63						
Data R.	13	6	4	1	2	2	1	0.7						
Data R.	13	6	4	2	1	1	10	4.5						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	13	6	4	2	1	2	34	15.17						
Data R.	13	6	4	2	2	1	1	0.3						
Data R.	13	6	4	2	2	2	1	0.1						
Data R.	13	7	2	1	1	2	1	9.5						
Data R.	13	7	3	1	1	2	5	10.6						
Data R.	13	7	3	2	1	2	5	8.41						
Data R.	13	7	3	1	1	2	2	5.92						
Data R.	13	7	4	1	1	2	4	5.1						
Data R.	13	7	4	1	2	2	1	0.4						
Data R.	13	7	4	2	1	1	1	0.74						
Data R.	13	7	4	1	1	1	2	1.53						
Data R.	13	7	4	2	1	2	17	9.84						
Data R.	13	7	4	1	1	2	3	1.57						
Data R.	13	7	4	2	2	2	1	1.6						
Data R.	14	1	4	1	1	2	4	1.6						
Data R.	14	1	4	2	1	2	6	1.19						
Data R.	14	1	4	1	1	2	1	0.63						
Data R.	14	1	4	2	2	2	3	0.7						
Data R.	14	1	4	2	1	1	1	0.2						
Data R.	14	2	4	2	1	2	5	0.5						
Data R.	14	3	4	1	1	1	5	1.9						
Data R.	14	3	4	1	1	2	19	9.5						
Data R.	14	3	4	2	1	1	2	0.4						
Data R.	14	3	4	2	1	2	22	5.2						
Data R.	14	3	4	1	1	2	1	0.1						
Data R.	14	4	2	1	1	2	2	9.9						
Data R.	14	4	3	1	1	2	3	7.5						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	14	4	3	2	1	2	3	3.6						
Data R.	14	4	4	1	1	1	4	2.8						
Data R.	14	4	4	1	1	2	14	8.2						
Data R.	14	4	4	2	1	1	11	2						
Data R.	14	4	4	2	1	2	25	7.4						
Data R.	14	4	4	2	2	2	4	1.3						
Data R.	14	5	3	1	1	2	1	2.2						
Data R.	14	5	4	1	1	1	3	0.9						
Data R.	14	5	4	1	1	2	8	5.5						
Data R.	14	5	4	2	1	1	9	2.2						
Data R.	14	5	4	2	1	2	20	5						
Data R.	14	5	4	2	2	2	1	0.13						
Data R.	14	5	4	2	1	2	1	0.1						
Data R.	14	6	3	1	1	2	5	18.6						
Data R.	14	6	3	1	2	2	1	6						
Data R.	14	6	4	1	1	1	4	1.7						
Data R.	14	6	4	1	1	2	8	4.3						
Data R.	14	6	4	2	1	2	3	1						
Data R.	14	6	4	2	2	2	1	0.59						
Data R.	14	6	4	2	1	2	3	0.78						
Data R.	14	6	4	2	1	2	19	8.4						
Data R.	14	7	3	1	1	2	5	4.3						
Data R.	14	7	3	2	1	2	1	3.2						
Data R.	14	7	3	2	1	2	2	6.5						
Data R.	14	7	4	1	1	1	7	4.7						
Data R.	14	7	4	1	1	2	13	9.7						
Data R.	14	7	4	2	1	1	5	2.26						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	14	7	4	2	1	2	1	0.11						
Data R.	14	7	4	2	1	2	9	5.2						
Data R.	14	7	4	2	2	2	1	1						
Data R.	14	8	4	2	1	2	1	0.4						
Data R.	14	8	4	1	1	2	4	5.6						
Data R.	15	1	4	1	1	2	3	1.7						
Data R.	15	2	4	1	1	2	2	0.4						
Data R.	15	3	4	1	1	2	3	0.4						
Data R.	15	3	4	2	1	2	29	4.56						
Data R.	15	3	4	2	1	1	4	0.55						
Data R.	15	3	4	2	2	2	1	0.2						
Data R.	15	4	3	2	1	2	1	1.3						
Data R.	15	4	3	2	1	2	2	3.5						
Data R.	15	4	4	1	1	1	2	0.4						
Data R.	15	4	4	1	1	2	32	18.1						
Data R.	15	4	4	1	1	2	1	0.6						
Data R.	15	4	4	2	1	1	4	0.59						
Data R.	15	4	4	1	1	1	1	0.25						
Data R.	15	4	4	2	1	2	52	10.64						
Data R.	15	4	4	1	1	1	1	0.21						
Data R.	15	5	3	1	1	2	6	24.2						
Data R.	15	5	4	1	1	1	2	0.8						
Data R.	15	5	4	1	1	2	11	11.7						
Data R.	15	5	4	2	1	1	8	3.03						
Data R.	15	5	4	1	1	1	1	0.36						
Data R.	15	5	4	2	1	2	36	18.08						
Data R.	15	5	4	2	1	1	1	0.15						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	15	5	4	2	2	2	1	0.9						
Data R.	15	6	3	1	1	1	2	6.9						
Data R.	15	6	3	1	1	2	8	21.8						
Data R.	15	6	3	1	2	2	1	4.2						
Data R.	15	6	3	2	1	2	6	11.2						
Data R.	15	6	3	2	2	2	1	2.42						
Data R.	15	6	3	1	1	2	1	1.94						
Data R.	15	6	3	1	3	1	1	10.6						
Data R.	15	6	4	1	1	2	19	14.9						
Data R.	15	6	4	1	2	2	2	4.33						
Data R.	15	6	4	1	1	2	1	0.1						
Data R.	15	6	4	2	1	1	8	3.6						
Data R.	15	6	4	2	2	2	5	2.4						
Data R.	15	6	4	2	1	2	11	5.84						
Data R.	15	6	broken base				1	0.47						
Data R.	15	6	4	2	1	1	1	0.94						
Data R.	15	6	4	1	1	1	1	1.33						
Data R.	15	6	4	1	2	2	1	0.7						
Data R.	15	6	4	1	2	2	1	28.6						
Data R.	15	7	3	1	1	1	2	4.5						
Data R.	15	7	3	1	1	2	6	23.3						
Data R.	15	7	3	2	1	2	4	8.3						
Data R.	15	7	3	2	2	2	1	1						
Data R.	15	7	4	1	1	1	1	2.6						
Data R.	15	7	4	1	1	2	8	7.2						
Data R.	15	7	4	1	1	2	2	1.7						
Data R.	15	7	4	2	1	1	9	3						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	15	7	4	2	1	2	16	11.3						
Data R.	15	7	4	2	2	2	3	0.8						
Data R.	15	8	3	2	1	2	1	1.5						
Data R.	15	8	3	1	1	2	1	4.2						
Data R.	15	8	4	1	1	2	3	3.1						
Data R.	15	8	4	2	1	2	1	0.4						
Data R.	16	1	4	1	1	2	2	0.66						
Data R.	16	1	4	2	1	2	9	1.68						
Data R.	16	1	4	1	1	2	1	0.16						
Data R.	16	1	4	2	1	1	1	0.15						
Data R.	16	1	4	2	1	1	1	0.54						
Data R.	16	2	4	1	1	2	2	0.75						
Data R.	16	2	4	2	1	2	1	0.6						
Data R.	16	2	4	2	1	1	1	0.23						
Data R.	16	3	4	1	1	1	3	2.97						
Data R.	16	3	4	1	1	2	10	11.2						
Data R.	16	3	4	2	1	1	2	0.27						
Data R.	16	3	4	2	1	1	3	2.66						
Data R.	16	3	4	2	1	2	11	2.54						
Data R.	16	3	4	2	2	2	1	0.63						
Data R.	16	3	4	2	1	2	1	0.04						
Data R.	16	4	3	1	1	1	4	7.21						
Data R.	16	4	3	1	1	2	1	2.61						
Data R.	16	4	4	1	1	1	3	1.7						
Data R.	16	4	4	1	1	2	4	3.18						
Data R.	16	4	4	2	1	1	3	0.52						
Data R.	16	4	4	1	1	1	1	0.82						

Phase	Unit /ST	Level	Size	Cortex	Raw Material	Heated/ Unheated	Ct.	Wt.	Percussion Shatter Ct.	Percussion Shatter Wt.	Fire-Cracked Rock/Shatter Ct.	Fire-Cracked Rock/Shatter Wt.	Natural Rock Ct.	Natural Rock Wt.
Data R.	16	4	4	2	1	2	28	6.35						
Data R.	16	4	4	1	1	2	5	2.99						
Data R.	16	5	3	1	1	2			1	11				
Data R.	16	5	4	1	1	1	8	5.6						
Data R.	16	5	4	1	1	2	13	10.6						
Data R.	16	5	4	2	1	2	11	3.85						
Data R.	16	5	4	2	1	2			1	0.6				
Data R.	16	5	4	2	1	1	5	0.75						
Data R.	16	6	2	1	1	2	1	4.9						
Data R.	16	6	3	2	1	2	2	3.8						
Data R.	16	6	4	1	1	2	8	6.5						
Data R.	16	6	4	2	1	2	13	6.4						
Data R.	16	6	4	1	1	1	2	0.6						
Data R.	16	7	3	1	1	2	4	12.8						
Data R.	16	7	3	1	3	1	1	5.3						
Data R.	16	7	4	1	1	1	9	3.9						
Data R.	16	7	4	2	1	1	4	1.5						
Data R.	16	7	4	2	1	2	5	1.8						
Data R.	16	7	4	1	1	2	4	4.3						

APPENDIX V:

Tabular data of all artifacts

Artifacts from Shovel Tests: Survey (MAC 12-05)							
Shovel Test	Level	Lot #	Spec #	Artifact Class	Count	Weight	Comments
9	1 (0-10)	49	1	Debitage	1	.206g	4112: 1/4", Cortical, Chert, Unheated
9	2 (10-20)	50	1	Debitage	2	.348g	4212: 1/4", Non-cortical, Chert, Unheated
9	3 (20-30)	51	1	Debitage	1	.091g	4112: 1/4", Cortical, Chert, Unheated
9	6 (50-60)	52	1	Debitage	1	.030g	4212: 1/4", Cortical, Chert, Unheated
9	7 (60-70)	53	1	Native Am. Pottery	2		Refit; Not in report
9	7 (60-70)	53	2	Debitage	1	.085g	4212: 1/4", Non-cortical, Chert, Unheated
9	8 (70-80)	54	1	Debitage	1	.051g	4212: 1/4", Non-cortical, Chert, Unheated
9	9 (80-90)	55	1	Debitage	1	.112g	4212: 1/4", Non-cortical, Chert, Unheated
9	10 (90-100)	56	1	Debitage	1	.249g	4212: 1/4", Non-cortical, Chert, Unheated
49	2 (10-20)	57	1	Bone-Nonhuman, Unmodified	1	.168g	
49	6 (50-60)	58	1	Debitage	1	.130g	4212: 1/4", Non-cortical, Chert, Unheated
49	7 (60-70)	59	1	Debitage	1	1.806g	3112: 1/2", Cortical, Chert, Unheated
49	7 (60-70)	59	2	Debitage	1	.748g	3212: 1/2", Non-cortical, Chert, Unheated
49	7 (60-70)	59	3	Debitage	1	1.644g	3222: 1/2", Non-cortical, Silicified Wood, Unheated
49	7 (60-70)	59	4	Debitage	1	2.882g	1212: 1", Non-cortical, Chert, Unheated
49	7 (60-70)	59	5	Debitage	1	5.349g	1112: 1", Cortical, Chert, Unheated
49	8 (70-80)	60	1	Debitage	2	.910g	4212: 1/4", Non-cortical, Chert, Unheated
49	8 (70-80)	60	2	Debitage	1	.441g	4111: 1/4", Cortical, Chert, Heated
49	8 (70-80)	60	3	Debitage	1	.300g	4112: 1/4", Cortical, Chert, Unheated
49	8 (70-80)	60	4	Debitage	1	.632g	3212: 1/2", Non-cortical, Chert, Unheated
49	8 (70-80)	60	5	Debitage	1	1.402g	3112: 1/2", Cortical, Chert, Unheated
49	8 (70-80)	60	6	Debitage	1	1.451g	3111: 1/2", Cortical, Chert, Heated
49	9 (80-90)	61	1	Debitage	1	.941g	3111: 1/2", Cortical, Chert, Heated
49	9 (80-90)	61	2	Debitage	1	.204g	4212: 1/4", Non-cortical, Chert, Unheated
49	10 (90-100)	62	1	Debitage	1	2.498g	1112: 1", Cortical, Chert, Unheated
49	10 (90-100)	62	2	Debitage	2	2.004g	3212: 1/2", Non-cortical, Chert, Unheated
49	10 (90-100)	62	3	Debitage	1	2.323g	3112: 1/2", Cortical, Chert, Unheated
49	10 (90-100)	62	4	Debitage	1	1.844g	3211: 1/2", Non-cortical, Chert, Heated
50	1 (0-10)	63	1	Debitage	1	.394g	3212: 1/2", Non-cortical, Chert, Unheated
50	1 (0-10)	63	2	Debitage	1	.041g	4211: 1/4", Non-cortical, Chert, Heated
50	4 (30-40)	64	1	Debitage	1	.516g	3112: 1/2", Cortical, Chert, Unheated
50	4 (30-40)	64	2	Debitage	1	.026g	4212: 1/4", Non-cortical, Chert, Unheated
50	4 (30-40)	64	3	Debitage	1	.112g	4112: 1/4", Cortical, Chert, Unheated
50	5 (40-50)	65	1	Debitage	1	.109g	4211: 1/4", Non-cortical, Chert, Heated

Shovel Test	Level	Lot #	Spec #	Artifact Class	Count	Weight	Comments
50	5 (40-50)	65	2	Debitage	3	.187g	4212: 1/4", Non-cortical, Chert, Unheated
50	6 (50-60)	66	1	Debitage	3	.355g	4112: 1/4", Cortical, Chert, Unheated
50	6 (50-60)	66	2	Debitage	1	.321g	3212: 1/2", Non-cortical, Chert, Unheated
50	7 (60-70)	67	1	Debitage	1	.122g	4211: 1/4", Non-cortical, Chert, Heated
50	7 (60-70)	67	2	Debitage	2	.152g	4212: 1/4", Non-cortical, Chert, Unheated
50	8 (70-80)	68	1	Debitage	1	.220g	4212: 1/4", Non-cortical, Chert, Unheated
51	3 (20-30)	69	1	Debitage	1	.230g	4112: 1/4", Cortical, Chert, Unheated
51	3 (20-30)	69	2	Debitage	1	.100g	4212: 1/4", Non-cortical, Chert, Unheated
51	3 (20-30)	69	3	Debitage	1	.237g	4111: 1/4", Cortical, Chert, Heated
51	4 (30-40)	70	1	Debitage	3	.510g	4212: 1/4", Non-cortical, Chert, Unheated
51	4 (30-40)	70	2	Debitage	1	.209g	4111: 1/4", Cortical, Chert, Heated
51	5 (40-50)	71	1	Debitage	4	.513g	4212: 1/4", Non-cortical, Chert, Unheated,
51	7 (60-70)	72	1	Debitage	3	.511g	4212: 1/4", Non-cortical, Chert, Unheated
51	7 (60-70)	72	2	Debitage	1	.768g	3212: 1/2", Non-cortical, Chert, Unheated
51	8 (70-80)	73	1	Debitage	1		Silicified Wood; missing from field
52	1 (0-10)	74	1	Debitage	1	.081g	4211: 1/4", Non-cortical, Chert, Heated
52	2 (10-20)	75	1	Debitage	2	.169g	4212: 1/4", Non-cortical, Chert, Unheated
52	3 (20-30)	76	1	Debitage	2	.239g	4212: 1/4", Non-cortical, Chert, Unheated
52	3 (20-30)	76	2	Debitage	1	.099g	4211: 1/4", Non-cortical, Chert, Heated
52	4 (30-40)	77	1	Debitage	1	.374g	4211: 1/4", Non-cortical, Chert, Heated
52	4 (30-40)	77	2	Debitage	5	.473g	4212: 1/4", Non-cortical, Chert, Unheated
52	5 (40-50)	78	1	Debitage	4	.592g	4212: 1/4", Non-cortical, Chert, Unheated,
52	5 (40-50)	78	2	Debitage	3	1.353g	4112: 1/4", Cortical, Chert, Unheated
52	5 (40-50)	78	3	Debitage	2	.273g	4211: 1/4", Non-cortical, Chert, Heated
52	6 (50-60)	79	1	Debitage	1	.099g	4212: 1/4", Non-cortical, Chert, Unheated
52	6 (50-60)	79	2	Debitage	1	.125g	4211: 1/4", Non-cortical, Chert, Heated
52	6 (50-60)	79	3	Debitage	1	.012g	4232: 1/4", Non-cortical, Quartzite, Unheated
53	1 (0-10)	80	1	Debitage	1	.196g	4112: 1/4", Cortical, Chert, Unheated
53	2 (10-20)	81	1	Debitage	1	.097g	4212: 1/4", Non-cortical, Chert, Unheated
54	1 (0-10)	82	1	Debitage	1	.106g	4212: 1/4", Non-cortical, Chert, Unheated
54	3 (20-30)	83	1	Debitage	2	.261g	4212: 1/4", Non-cortical, Chert, Unheated
54	3 (20-30)	83	2	Debitage	1	.363g	3211: 1/2", Non-cortical, Chert, Heated
54	4 (30-40)	84	1	Debitage	1	.215g	4112: 1/4", Cortical, Chert, Unheated
54	5 (40-50)	85	1	Debitage	4	.463g	4212: 1/4", Non-cortical, Chert, Unheated
54	6 (50-60)	86	1	Debitage	2	.207g	4212: 1/4", Non-cortical, Chert, Unheated
54	6 (50-60)	86	2	Debitage	2	.643g	4112: 1/4", Cortical, Chert, Unheated

Shovel Test	Level	Lot #	Spec #	Artifact Class	Count	Weight	Comments
54	7 (60-70)	87	1	Debitage	1	.131g	4212: 1/4", Non-cortical, Chert, Unheated
54	8 (70-80)	88	1	Debitage	2	3.184g	2212: 3/4", Non-cortical, Chert, Unheated
54	8 (70-80)	88	2	Debitage	3	1.176g	3212: 1/2", Non-cortical, Chert, Unheated
54	8 (70-80)	88	3	Debitage	1	1.366g	2112: 3/4", Cortical, Chert, Unheated
54	8 (70-80)	88	4	Projectile point	1		Tool # 1 *Gary/Kent*
54	9 (80-90)	89	1	Debitage	1	.125g	4212: 1/4", Non-cortical, Chert, Unheated
54	10 (90-100)	90	1	Debitage	1	.283g	2212: 3/4", Non-cortical, Chert, Unheated
56	8 (70-80)	91	1	Debitage	1	.092g	4212: 1/4", Non-cortical, Chert, Unheated
79	3 (20-30)	92	1	Debitage	1	.095g	4212: 1/4", Non-cortical, Chert, Unheated
79	5 (40-50)	93	1	Debitage	3	.159g	4212: 1/4", Non-cortical, Chert, Unheated
79	6 (50-60)	94	1	Debitage	1	.091g	4212: 1/4", Non-cortical, Chert, Unheated
79	6 (50-60)	94	2	Debitage	1	.406g	3212: 1/2", Non-cortical, Chert, Unheated
79	6 (50-60)	94	3	Debitage	1	.353g	Percussion Shatter
79	7 (60-70)	95	1	Debitage	2	.233g	4212: 1/4", Non-cortical, Chert, Unheated
80	4 (30-40)	96	1	Debitage	1	.739g	3112: 1/2", Cortical, Chert, Unheated
80	4 (30-40)	96	2	Debitage	1	.137g	4212: 1/4", Non-cortical, Chert, Unheated
80	6 (50-60)	97	1	Debitage	1	.061g	4212: 1/4", Non-cortical, Chert, Unheated
80	6 (50-60)	97	2	Debitage	1	.775g	4212: 1/4", Non-cortical, Chert, Unheated
80	7 (60-70)	98	1	Debitage	1	.208g	4112: 1/4", Cortical, Chert, Unheated;
80	7 (60-70)	98	2	Debitage	1	1.012g	2212: 3/4", Non-cortical, Chert, Unheated;
82	2 (10-20)	99	1	Debitage	1	.087g	4212: 1/4", Non-cortical, Chert, Unheated
82	3 (20-30)	100	1	Debitage	1	.044g	4212: 1/4", Non-cortical, Chert, Unheated
82	4 (30-40)	101	1	Debitage	2	.436g	4212: 1/4", Non-cortical, Chert, Unheated
82	4 (30-40)	101	2	Debitage	1	.243g	4112: 1/4", Cortical, Chert, Unheated
82	4 (30-40)	101	3	Debitage	1	.040g	4212: 1/4", Non-cortical, Chert, Unheated
82	5 (40-50)	102	1	Debitage	2	.114g	4212: 1/4", Non-cortical, Chert, Unheated
82	6 (50-60)	103	1	Debitage	3	.240g	4212: 1/4", Non-cortical, Chert, Unheated
82	7 (60-70)	104	1	Debitage	1	1.653g	2212: 3/4", Non-cortical, Chert, Unheated
82	8 (70-80)	105	1	Debitage	1	.117g	4212: 1/4", Non-cortical, Chert, Unheated
82	9 (80-90)	106	1	Debitage	1	2.214g	FCR
82	9 (80-90)	106	2	Debitage	1	.221g	4112: 1/4", Non-cortical, Chert, Unheated
84	1 (0-10)	107	1	Debitage	2	.438g	4212: 1/4", Non-cortical, Chert, Unheated
84	1 (0-10)	107	2	Debitage	1	.400g	4112: 1/4", Cortical, Chert, Unheated
84	2 (10-20)	108	1	Debitage	2	.018g	4212: 1/4", Non-cortical, Chert, Unheated
84	3 (20-30)	109	1	Debitage	1	.330g	Shatter

Shovel Test	Level	Lot #	Spec #	Artifact Class	Count	Weight	Comments
84	3 (20-30)	109	2	Debitage	1	.105g	4222: 1/4", Non-cortical, Silicified Wood, Unheated
84	4 (30-40)	110	1	Debitage	1	1.457g	2212: 3/4", Non-cortical, Chert, Unheated
84	4 (30-40)	110	2	Debitage	2	.444g	4212: 1/4", Non-cortical, Chert, Unheated
84	4 (30-40)	110	3	Debitage	1	.521g	4112: 1/4", Cortical, Chert, Unheated
84	5 (40-50)	111	1	Debitage	2	.168g	4212: 1/4", Non-cortical, Chert, Unheated
84	6 (50-60)	112	1	Debitage	2	.327g	4212: 1/4", Non-cortical, Chert, Unheated

Artifacts from XUs 1-4: Significance Testing Investigations (MAC 12-05)									
Unit	**Trench**	**Depth (cmbs)**	**Level**	**Lot**	**Specimen**	**Artifact Category**	**Count**	**Wt. (g)**	**Description**
1	1	20-30	3	9	1	Debitage	4	6.6	4212: 1/4", Non-cortical, Chert, Unheated
1	1	20-30	3	9	2	Debitage	1	1.97	4122: 1/4" Cortical, Silicified Wood, Unheated
1	1	30-40	4	10	1	Debitage	1	0.06	4211: 1/4", Non-cortical, Chert, Heated
1	1	30-40	4	10	2	Debitage	1	0.25	4212: 1/4", Non-cortical, Chert, Unheated
1	1	40-50	5	11	1	Debitage	1	0.03	4213: 1/4", Non-cortical, Chert, Indeterminate
1	1	40-50	5	11	2	Debitage	1	0.09	4111: 1/4", Cortical, Chert, Heated
1	1	50-60	6	12	1	Debitage	1	0.3	4111: 1/4", Cortical, Chert, Heated
1	1	50-60	6	12	2	Debitage	1	0.06	4213: 1/4", Non-cortical, Chert, Indeterminate
1	1	60-70	7	13	1	Debitage	2	0.2	4212: 1/4", Non-cortical, Chert, Unheated
1	1	70-80	8	14	1	Debitage	3	0.24	4212: 1/4", Non-cortical, Chert, Unheated
1	1	80-90	9	15	1	Debitage	1	0.3	4212: 1/4", Non-cortical, Chert, Unheated
1	1	90-100	10	16	1	Debitage	2	0.13	4212: 1/4", Non-cortical, Chert, Unheated
2	1	10-20	2	17	1	Debitage	1	0.12	4212: 1/4", Non-cortical, Chert, Unheated
2	1	10-20	2	17	2	Debitage	1	0.13	4211: 1/4", Non-cortical, Chert, Heated
2	1	10-20	2	17	3	Debitage	3	0.56	4212: 1/4", Non-cortical, Chert, Unheated
2	1	20-30	3	18	1	Debitage	3	0.29	4212: 1/4", Non-cortical, Chert, Unheated
2	1	20-30	3	18	2	Debitage	1	0.16	4211: 1/4", Non-cortical, Chert, Heated
2	1	20-30	3	18	3	Debitage	3	0.7	4112: 1/4", Cortical, Chert, Unheated
2	1	20-30	3	18	4	Charcoal	1	0.96	
2	1	20-30	3	18	5	Botanical	1	0.09	Floral remains
2	1	20-30	3	18	6	Shell	5	0.5	Mussel shell, Unmodified
2	1	20-30	3	18	7	Flat Glass	1	0.74	Clear
2	1	30-40	4	19	1	Debitage	2	0.25	4211: 1/4", Non-cortical, Chert, Heated
2	1	30-40	4	19	2	Debitage	3	2.7	4112: 1/4", Cortical, Chert, Unheated
2	1	70-80	8	20	1	Debitage	1	0.2	4211: 1/4", Non-cortical, Chert, Heated
2	1	70-80	8	20	2	Debitage	2	0.17	4112: 1/4", Cortical, Chert, Unheated

Unit	Trench	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Count	Wt. (g)	Description
2	1	70-80	8	20	3	Debitage	4	0.51	4212: 1/4", Non-cortical, Chert, Unheated
2	1	80-90	9	21	1	Debitage	1	0.33	4212: 1/4", Non-cortical, Chert, Unheated
2	1	80-90	9	21	2	Debitage	2	0.28	4211: 1/4", Non-cortical, Chert, Heated
2	1	90-100	10	22	1	Debitage	1	0.04	4212: 1/4", Non-cortical, Chert, Unheated
2	1	100-110	11	23	1	Debitage	2	0.18	4212: 1/4", Non-cortical, Chert, Unheated
2	1	110-120	12	24	1	Debitage	1	0.08	4222: 1/4", Non-cortical, Silicified Wood, Unheated
2	1	not recorded	not recorded	25	1	Debitage	1	0.16	From ash deposit in Trench 1
3	1	0-10	1	26	1	Debitage	6	0.93	4212: 1/4", Non-cortical, Chert, Unheated
3	1	0-10	1	26	2	Debitage	1	0.78	4111: 1/4", Cortical, Chert, Heated
3	1	0-10	1	26	3	Debitage	1	0.43	4122: 1/4" Cortical, Silicified Wood, Unheated
3	1	0-10	1	26	4	Debitage	1	0.11	4211: 1/4", Non-cortical, Chert, Heated
3	1	10-20	2	27	1	Debitage	4	0.8	4211: 1/4", Non-cortical, Chert, Heated
3	1	10-20	2	27	2	Debitage	4	1.62	4111: 1/4", Cortical, Chert, Heated
3	1	10-20	2	27	3	Debitage	6	1.87	4112: 1/4", Cortical, Chert, Unheated
3	1	10-20	2	27	4	Debitage	18	2.73	4212: 1/4", Non-cortical, Chert, Unheated
3	1	20-30	3	28	1	Debitage	5	2.41	4111: 1/4", Cortical, Chert, Heated
3	1	20-30	3	28	2	Debitage	11	5.88	4112: 1/4", Cortical, Chert, Unheated
3	1	20-30	3	28	3	Debitage	1	0.5	4211: 1/4", Non-cortical, Chert, Heated
3	1	20-30	3	28	4	Debitage	1	0.46	4211: 1/4", Non-cortical, Chert, Heated; FCR Shatter
3	1	20-30	3	28	5	Debitage	15	2.53	4212: 1/4", Non-cortical, Chert, Unheated
3	1	20-30	3	28	6	Debitage	7	1.14	4222: 1/4", Non-cortical, Silicified Wood, Unheated
3	1	30-40	4	29	1	Dart Point	1	4.1	Tool # 2: Kent, Silicified Wood
3	1	30-40	4	29	2	Debitage	1	3.87	3112: 1/2", Cortical, Chert, Unheated
3	1	30-40	4	29	3	Debitage	2	4.35	3212: 1/2", Non-cortical, Chert, Unheated
3	1	30-40	4	29	4	Debitage	11	5.52	4112: 1/4", Cortical, Chert, Unheated
3	1	30-40	4	29	5	Debitage	8	3.1	4111: 1/4", Cortical, Chert, Heated
3	1	30-40	4	29	6	Debitage	2	1.04	4211: 1/4", Non-cortical, Chert, Heated
3	1	30-40	4	29	7	Debitage	26	4.57	4212: 1/4", Non-cortical, Chert, Unheated

Unit	Trench	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Count	Wt. (g)	Description
3	1	30-40	4	29	8	Debitage	1	0.31	4121: 1/4", Cortical, Silicified Wood, Heated
3	1	30-40	4	29	9	Debitage	1	0.19	4222: 1/4", Non-cortical, Silicified Wood, Unheated
3	1	40-50	5	30	1	Debitage	1	2.3	3212: 1/2", Non-cortical, Chert, Heated
3	1	40-50	5	30	2	Debitage	1	0.61	4222: 1/4", Non-cortical, Silicified Wood, Unheated
3	1	40-50	5	30	3	Debitage	3	0.42	4211: 1/4", Non-cortical, Chert, Heated
3	1	40-50	5	30	4	Debitage	15	6	4112: 1/4", Cortical, Chert, Unheated
3	1	40-50	5	30	5	Debitage	8	1.53	4111: 1/4", Cortical, Chert, Heated
3	1	40-50	5	30	6	Debitage	28	6.1	4212: 1/4", Non-cortical, Chert, Unheated
3	1	50-60	6	31	1	Dart Point	1	1	Tool # 3: Fragment, Base, Chert
3	1	50-60	6	31	2	Debitage	1	1.29	3111: 1/2", Cortical, Chert, Heated
3	1	50-60	6	31	3	Debitage	2	2.41	3212: 1/2", Non-cortical, Chert, Heated
3	1	50-60	6	31	4	Debitage	3	6.59	3112: 1/2", Cortical, Chert, Unheated
3	1	50-60	6	31	5	Debitage	2	0.84	4222: 1/4", Non-cortical, Silicified Wood, Unheated
3	1	50-60	6	31	6	Debitage	10	3.8	4211: 1/4", Non-cortical, Chert, Heated
3	1	50-60	6	31	7	Debitage	13	5.9	4111: 1/4", Cortical, Chert, Heated
3	1	50-60	6	31	8	Debitage	23	15.13	4112: 1/4", Cortical, Chert, Unheated
3	1	50-60	6	31	9	Debitage	45	11.34	4212: 1/4", Non-cortical, Chert, Unheated
3	1	60-70	7	32	1	Biface	1	1	Tool # 4: Primary stage biface fragment, Chert
3	1	60-70	7	32	2	Debitage	6	22.73	3112: 1/2", Cortical, Chert, Unheated
3	1	60-70	7	32	3	Debitage	2	4.5	3111: 1/2", Cortical, Chert, Heated
3	1	60-70	7	32	4	Debitage	4	2.22	4111: 1/4", Cortical, Chert, Heated
3	1	60-70	7	32	5	Debitage	6	14.86	3212: 1/2", Non-cortical, Chert, Heated
3	1	60-70	7	32	6	Debitage	2	0.84	4222: 1/4", Non-cortical, Silicified Wood, Unheated
3	1	60-70	7	32	7	Debitage	39	16.29	4212: 1/4", Non-cortical, Chert, Unheated
3	1	60-70	7	32	8	Debitage	2	0.39	4112: 1/4", Cortical, Chert, Unheated
3	1	70	8	33	1	Dart Point	1	11.5	Tool # 5: Bulverde, Chert
3	1	70-80	8	33	2	Debitage	2	4.78	3212: 1/2", Non-cortical, Chert, Heated
3	1	70-80	8	33	3	Debitage	4	5.25	4111: 1/4", Cortical, Chert, Heated

Unit	Trench	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Count	Wt. (g)	Description
3	1	70-80	8	33	4	Debitage	1	1.26	4122: 1/4" Cortical, Silicified Wood, Unheated
3	1	70-80	8	33	5	Debitage	10	6.23	4112: 1/4", Cortical, Chert, Unheated
3	1	70-80	8	33	6	Debitage	6	3.1	4211: 1/4", Non-cortical, Chert, Heated
3	1	70-80	8	33	7	Debitage	11	3.14	4212: 1/4", Non-cortical, Chert, Unheated
3	1	80-90	9	34	1	Debitage	1	0.09	4212: 1/4", Non-cortical, Chert, Unheated
3	1	80-90	9	34	2	Debitage	1	5.07	3112: 1/2", Cortical, Chert, Unheated
3	1	80-90	9	34	3	Debitage	2	3.82	4112: 1/4", Cortical, Chert, Unheated
3	1	Slump	Slump	35	1	Dart Point	1	3.6	Tool # 6: Fragment
3	1	Slump	Slump	35	2	Debitage	1	0.56	4111: 1/4", Cortical, Chert, Heated
3	1	Slump	Slump	35	3	Debitage	1	0.44	4112: 1/4", Cortical, Chert, Unheated
3	1	Slump	Slump	35	4	Debitage	2	0.6	4212: 1/4", Non-cortical, Chert, Unheated
4	2	0-10	1	36	1	Debitage	2	0.21	4112: 1/4", Cortical, Chert, Unheated
4	2	0-10	1	36	2	Debitage	9	1.06	4212: 1/4", Non-cortical, Chert, Unheated
4	2	10-20	2	37	1	Debitage	1	0.16	4111: 1/4", Cortical, Chert, Heated
4	2	10-20	2	37	2	Debitage	3	0.74	4112: 1/4", Cortical, Chert, Unheated
4	2	10-20	2	37	3	Debitage	1	0.29	4211: 1/4", Non-cortical, Chert, Heated
4	2	10-20	2	37	4	Debitage	9	1.6	4212: 1/4", Non-cortical, Chert, Unheated
4	2	20-30	3	38	1	Debitage	1	0.15	4122: 1/4" Cortical, Silicified Wood, Unheated
4	2	20-30	3	38	2	Debitage	3	0.86	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	20-30	3	38	3	Debitage	6	1.81	4111: 1/4", Cortical, Chert, Heated
4	2	20-30	3	38	4	Debitage	2	0.25	4211: 1/4", Non-cortical, Chert, Heated
4	2	20-30	3	38	5	Debitage	23	2.49	4212: 1/4", Non-cortical, Chert, Unheated
4	2	30-40	4	39	1	Debitage	24	2.56	4212: 1/4", Non-cortical, Chert, Unheated
4	2	30-40	4	39	2	Debitage	2	0.43	4111: 1/4", Cortical, Chert, Heated
4	2	30-40	4	39	3	Debitage	2	0.36	4122: 1/4" Cortical, Silicified Wood, Unheated
4	2	30-40	4	39	4	Debitage	5	0.51	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	30-40	4	39	5	Debitage	3	0.25	4211: 1/4", Non-cortical, Chert, Heated
4	2	30-40	4	39	6	Debitage	6	1.05	4112: 1/4", Cortical, Chert, Unheated

Unit	Trench	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Count	Wt. (g)	Description
4	2	40-50	5	40	1	Debitage	2	0.34	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	40-50	5	40	2	Debitage	12	1.59	4212: 1/4", Non-cortical, Chert, Unheated
4	2	40-50	5	40	3	Debitage	2	0.51	4112: 1/4", Cortical, Chert, Unheated
4	2	40-50	5	40	4	Debitage	2	0.23	4211: 1/4", Non-cortical, Chert, Heated
4	2	40-50	5	40	5	Debitage	7	1.76	4111: 1/4", Cortical, Chert, Heated
4	2	50-60	6	41	1	Biface	1	38.3	Tool # 8: Initial Stage
4	2	50-60	6	41	2	Debitage	1	7.41	3112: 1/2", Cortical, Chert, Unheated
4	2	50-60	6	41	3	Debitage	1	0.51	Percussion Shatter: 4112: 1/4", Cortical, Chert, Unheated
4	2	50-60	6	41	4	Debitage	1	1.51	4122: 1/4" Cortical, Silicified Wood, Unheated
4	2	50-60	6	41	5	Debitage	1	0.5	4211: 1/4", Non-cortical, Chert, Heated; FCR Shatter
4	2	50-60	6	41	6	Debitage	2	0.44	4121: 1/4", Cortical, Silicified Wood, Heated
4	2	50-60	6	41	7	Debitage	11	2.48	4211: 1/4", Non-cortical, Chert, Heated
4	2	50-60	6	41	8	Debitage	7	1.16	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	50-60	6	41	9	Debitage	2	0.66	4221: 1/4", Non-cortical, Silicified Wood, Heated
4	2	50-60	6	41	10	Debitage	8	3.67	4111: 1/4", Cortical, Chert, Heated
4	2	50-60	6	41	11	Debitage	38	6.96	4212: 1/4", Non-cortical, Chert, Unheated
4	2	50-60	6	41	12	Debitage	18	3.72	4112: 1/4", Cortical, Chert, Unheated
4	2	60-70	7	42	1	Debitage	1	1	3211: 1/2", Non-cortical, Chert, Heated
4	2	60-70	7	42	2	Debitage	1	1.14	3222: 1/2", Non-cortical, Silicified Wood, Unheated
4	2	60-70	7	42	3	Debitage	2	0.44	4122: 1/4", Cortical, Silicified Wood, Unheated
4	2	60-70	7	42	4	Debitage	7	1.28	4211: 1/4", Non-cortical, Chert, Heated
4	2	60-70	7	42	5	Debitage	7	3.3	4112: 1/4", Cortical, Chert, Unheated
4	2	60-70	7	42	6	Debitage	28	3.89	4212: 1/4", Non-cortical, Chert, Unheated
4	2	60-70	7	42	7	Debitage	6	1.85	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	60-70	7	42	8	Debitage	7	2	4111: 1/4", Cortical, Chert, Heated
4	2	70-80	8	43	1	Debitage	1	1.77	3212: 1/2", Non-cortical, Chert, Unheated
4	2	70-80	8	43	2	Debitage	1	2.22	4122: 1/4" Cortical, Silicified Wood, Unheated
4	2	70-80	8	43	3	Debitage	2	0.15	4222: 1/4", Non-cortical, Silicified Wood, Unheated

Unit	Trench	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Count	Wt. (g)	Description
4	2	70-80	8	43	4	Debitage	4	2.61	4111: 1/4", Cortical, Chert, Heated
4	2	70-80	8	43	5	Debitage	5	1.46	4212: 1/4", Non-cortical, Chert, Unheated
4	2	70-80	8	43	6	Debitage	7	3.16	4112: 1/4", Cortical, Chert, Unheated
4	2	80-90	9	44	1	Debitage	3	10.01	3112: 1/2", Cortical, Chert, Unheated
4	2	80-90	9	44	2	Debitage	2	3.48	3111: 1/2", Cortical, Chert, Heated
4	2	80-90	9	44	3	Debitage	1	1	4111: 1/4", Cortical, Chert, Heated
4	2	80-90	9	44	4	Debitage	3	2.44	4112: 1/4", Cortical, Chert, Unheated
4	2	80-90	9	44	5	Debitage	5	0.79	4211: 1/4", Non-cortical, Chert, Heated
4	2	80-90	9	44	6	Debitage	6	4.3	4212: 1/4", Non-cortical, Chert, Unheated
4	2	80-90	9	44	7	Debitage	4	0.84	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	80-90	9	44	8	Debitage	3	3.6	4112: 1/4", Non-cortical, Chert, Unheated
4	2	90-100	10	45	1	Debitage	2	3.86	3122: 1/2", Cortical, Silicified Wood, Unheated
4	2	90-100	10	45	2	Debitage	1	1.1	3212: 1/2", Non-cortical, Chert, Unheated
4	2	90-100	10	45	3	Debitage	2	0.32	4111: 1/4", Cortical, Chert, Heated
4	2	90-100	10	45	4	Debitage	2	2.9	4222: 1/4", Non-cortical, Silicified Wood, Unheated
4	2	90-100	10	45	5	Debitage	5	3.76	4111: 1/4", Cortical, Chert, Heated
4	2	90-100	10	45	6	Debitage	3	1.63	4112: 1/4", Cortical, Chert, Unheated
4	2	90-100	10	45	7	Debitage	6	0.61	4211: 1/4", Non-cortical, Chert, Heated
4	2	90-100	10	45	8	Debitage	7	2.36	4212: 1/4", Non-cortical, Chert, Unheated
4	2	100-110	11	46	1	Debitage	3	0.69	4212: 1/4", Non-cortical, Chert, Unheated
4	2	100-110	11	46	2	Debitage	2	3	4111: 1/4", Cortical, Chert, Heated
4	2	100-110	11	46	3	Debitage	1	1.67	4112: 1/4", Cortical, Chert, Unheated
4	2	110-120	12	47	1	Debitage	1	1.18	4211: 1/4", Non-cortical, Chert, Heated
N/A	3	not recorded	not recorded	48	1	Dart Point	1	7.6	Tool # 7: Proximal/medial fragment, heavily patinated

Artifacts from XUs 5-16: Data Recovery investigations								
Unit	**Depth (cmbs)**	**Level**	**Lot**	**Specimen**	**Artifact Category**	**Ct.**	**Wt. (g)**	**Description**
5	0-20	1	1	1	Iron - Nail	1		Heavily corroded
5	0-20	1	1	2	Debitage	1	0.1	1/4", Cortex, Chert, 3
5	0-20	1	1	3	Debitage	3	1.1	1/4", Cortex, Chert, Unheated
5	0-20	1	1	4	Debitage	12	2	1/4", No cortex, Chert, Unheated
5	20-30	2	2	1	Brick	1		Fragment
5	20-30	2	2	2	Ammunition	1		lead (Pb) pellet
5	20-30	2	2	3	Debitage	1	0.5	1/4", No cortex, Chert, Heated
5	20-30	2	2	4	Debitage	2	0.6	1/4", Cortex, Chert, Unheated
5	20-30	2	2	5	Debitage	3	0.8	1/4", No cortex, Chert, Unheated
5	30-40	3	3	1	Burned Clay	1		Fragment
5	30-40	3	3	2	Debitage	1	1.20	1/2", No cortex, Chert, Unheated
5	30-40	3	3	3	Debitage	1	0.4	1/4", No cortex, Chert, Heated, FCR/Shatter
5	30-40	3	3	4	Debitage	1	4.5	3/4", Cortex, Chert, Unheated
5	30-40	3	3	5	Debitage	2	0.3	1/4", No cortex, Chert, Heated
5	30-40	3	3	6	Debitage	2	4.7	1/2", Cortex, Chert, Unheated
5	30-40	3	3	7	Debitage	5	1.9	1/4", Cortex, Chert, Heated
5	30-40	3	3	8	Debitage	9	3.7	1/4", Cortex, Chert, Unheated
5	30-40	3	3	9	Debitage	30	7.4	1/4", No cortex, Chert, Unheated
5	40-50	4	4	1	Debitage	1	5.1	3/4", Cortex, Chert, Unheated
5	40-50	4	4	2	Debitage	1	1.5	1/2", Cortex, Chert, Unheated
5	40-50	4	4	3	Debitage	1	0.4	1/4", Cortex, Chert, Indeterminate heating
5	40-50	4	4	4	Debitage	3	0.8	1/4", Cortex, Chert, Heated
5	40-50	4	4	5	Debitage	5	1.7	1/4", No cortex, Silicified Wood, Unheated
5	40-50	4	4	6	Debitage	13	4.2	1/4", No cortex, Chert, Heated
5	40-50	4	4	7	Debitage	20	8.4	1/4", Cortex, Chert, Unheated
5	40-50	4	4	8	Debitage	36	8.1	1/4", No cortex, Chert, Unheated
5	50-60	5	5	1	Debitage	1	4.4	3/4", Cortex, Chert, Unheated
5	50-60	5	5	2	Debitage	1	4.4	1/2", Cortex, Chert, Unheated
5	50-60	5	5	3	Debitage	1	0.1	1/4", Cortex, Silicified Wood, Unheated
5	50-60	5	5	4	Debitage	4	1.8	1/4", Cortex, Chert, Heated
5	50-60	5	5	5	Debitage	6	1.9	1/4", No cortex, Silicified Wood, Unheated
5	50-60	5	5	6	Debitage	9	1.4	1/4", No cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
5	50-60	5	5	7	Debitage	19	11	1/4", Cortex, Chert, Unheated
5	50-60	5	5	8	Debitage	43	11	1/4", No cortex, Chert, Unheated
5	60-70	6	6	1	Biface	1	11	Tool # 9: Initial stage biface
5	60-70	6	6	2	Debitage	1	6.7	3/4", Cortex, Chert, Unheated
5	60-70	6	6	3	Debitage	1	2.6	1/2", Cortex, Chert, Heated, Percussion Shatter
5	60-70	6	6	4	Debitage	1	2	1/2", Cortex, Chert, Unheated
5	60-70	6	6	5	Debitage	1	1.6	1/2", No cortex, Chert, Unheated
5	60-70	6	6	6	Debitage	3	0.9	1/4", Cortex, Chert, Heated
5	60-70	6	6	7	Debitage	7	0.7	1/4", No cortex, Chert, Heated
5	60-70	6	6	8	Debitage	15	5	1/4", No cortex, Chert, Unheated
5	60-70	6	6	9	Debitage	16	11	1/4", Cortex, Chert, Unheated
5	70-80	7	7	1	Mineral	1	15	Ochre
5	70-80	7	7	2	Debitage	2	1.8	1/4", Cortex, Silicified Wood, Unheated
5	70-80	7	7	3	Debitage	3	11	1/2", No cortex, Chert, Unheated
5	70-80	7	7	4	Debitage	3	1.4	1/4", No cortex, Chert, Heated
5	70-80	7	7	5	Debitage	4	14	1/2", Cortex, Chert, Unheated
5	70-80	7	7	6	Debitage	4	3.2	1/4", Cortex, Chert, Heated
5	70-80	7	7	7	Debitage	7	5.2	1/4", Cortex, Chert, Unheated
5	70-80	7	7	8	Debitage	13	5.2	1/4", No cortex, Chert, Unheated
5	80-90	8	8	1	Debitage	1	2.1	1/4", Cortex, Silicified Wood, Unheated
5	80-90	8	8	2	Debitage	2	2.7	1/4", Cortex, Chert, Heated
5	80-90	8	8	3	Debitage	2	0.3	1/4", No cortex, Chert, Unheated
5	80-90	8	8	4	Debitage	2	1.3	1/4", No cortex, Chert, Heated
5	80-90	8	8	5	Debitage	9	9.7	1/4", Cortex, Chert, Unheated
5	90-100	9	9	1	Debitage	2	2.2	1/4", Cortex, Chert, Unheated
5	90-100	9	9	2	Debitage	2	1	1/4", No cortex, Chert, Heated
5	100-110	10	10	1	Debitage	1	4.7	1/2", Cortex, Chert, Unheated
5	110-120	11	11	1	Debitage	3	1.1	1/4", No cortex, Chert, Unheated
5	120-130	12	12	1	Native American Ceramic	1	2.1	Goose Creek Plain, Body sherd, undecorated
6	0-20	1	13	1	Debitage	1	0.6	1/4", Cortex, Chert, Unheated, Percussion Shatter

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
6	0-20	1	13	2	Debitage	1	21.97	1", Cortex, Chert, Unheated
6	0-20	1	13	3	Debitage	1	0.3	1/4", Cortex, Chert, Heated, FCR/Shatter
6	0-20	1	13	4	Debitage	1	0.3	1/4", No cortex, Chert, Unheated
6	0-20	1	13	5	Curved Glass - Clear	2		clear
6	0-20	1	13	6	Debitage	3	1.1	1/4", Cortex, Chert, Unheated
6	20-30	2	14	1	Debitage	1	0.2	1/4", No cortex, Chert, Unheated
6	20-30	2	14	2	Debitage	1	0.1	1/4", No cortex, Chert, 3
6	20-30	2	14	3	Historic Ceramics	1		Rim? Fragment with brown glaze
6	20-30	2	14	4	Curved Glass - Clear	1		clear
6	30-40	3	15	1	Debitage	2	0.7	1/4", No cortex, Silicified Wood, Unheated
6	30-40	3	15	2	Debitage	3	0.8	1/4", Cortex, Chert, Heated
6	30-40	3	15	3	Debitage	15	4.5	1/4", Cortex, Chert, Unheated
6	30-40	3	15	4	Debitage	6	1.2	1/4", No cortex, Chert, Heated
6	30-40	3	15	5	Debitage	24	5.6	1/4", No cortex, Chert, Unheated
6	40-50	4	16	1	Debitage	1	1	1/4", Cortex, Chert, Indeterminate heating
6	40-50	4	16	3	Debitage	5	1.5	1/4", Cortex, Chert, Heated
6	40-50	4	16	4	Debitage	3	0.8	1/4", No cortex, Silicified Wood, Unheated
6	40-50	4	16	5	Debitage	2	1.5	1/4", No cortex, Chert, Indeterminate heating
6	40-50	4	16	7	Debitage	8	1.2	1/4", No cortex, Chert, Heated
6	40-50	4	16	10	Debitage	31	16	1/4", Cortex, Chert, Unheated
6	40-50	4	16	11	Debitage	74	17	1/4", No cortex, Chert, Unheated
6	40-50	4	16	2	Dart Point	1	1	Tool # 10; Fragment
6	40-50	4	16	6	Native American Ceramic	2	12	Goose Creek Plain, Body sherds
6	40-50	4	16	8	Native American Ceramic	2	14	Goose Creek Plain, Body sherds, oxidized
6	40-50	4	16	9	Native American Ceramic	2	5.3	Goose Creek Plain, Body sherds, oxidized
6	40-50	4	16	12	Native American Ceramic	3	8.8	Goose Creek Plain, Body sherds, Burned
6	40-50	4	16	13	Native American Ceramic	2	2.9	Goose Creek Plain, Body sherds
6	50-60	5	17	1	Debitage	1	1.6	1/2", Cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
6	50-60	5	17	2	Debitage	1	3	1/2", Cortex, Silicified Wood, Heated
6	50-60	5	17	3	Debitage	1	0.7	1/2", No cortex, Chert, Unheated
6	50-60	5	17	4	Debitage	12	6.5	1/4", Cortex, Chert, Heated
6	50-60	5	17	5	Native American Ceramic	2	4.6	Goose Creek Plain, Undecorated body sherds, burned
6	50-60	5	17	6	Debitage	3	7.9	1/2", Cortex, Chert, Unheated
6	50-60	5	17	8	Burned Clay	3	1.6	Fragment
6	50-60	5	17	7	Debitage	5	1.3	1/4", No cortex, Chert, Heated
6	50-60	5	17	#	Debitage	20	16	1/4", Cortex, Chert, Unheated
6	50-60	5	17	9	Debitage	35	8.1	1/4", No cortex, Chert, Unheated
6	60-70	6	18	1	Debitage	1	1.4	1/4", Cortex, Silicified Wood, Unheated
6	60-70	6	18	2	Biface	1	11	Tool # 11: Chert, Dart Preform Fragment
6	60-70	6	18	3	Biface	1	17	Tool # 12: Silicified Wood, Primary stage biface
6	60-70	6	18	4	Native American Ceramic	1		Goose Creek Plain, Body sherd
6	60-70	6	18	5	Native American Ceramic	2		Goose Creek Plain, Body sherds, refit
6	60-70	6	18	6	Debitage	5	0.5	1/4", No cortex, Chert, Heated
6	60-70	6	18	7	Debitage	3	9.1	1/2", Cortex, Chert, Unheated
6	60-70	6	18	8	Debitage	3	0.9	1/4", Cortex, Chert, Heated
6	60-70	6	18	#	Debitage	13	11	1/4", Cortex, Chert, Unheated
6	60-70	6	18	9	Debitage	16	4.7	1/4", No cortex, Chert, Unheated
6	70-80	7	19	1	Burned Clay	1	32	Fragment
6	70-80	7	19	2	Native American Ceramic	2		Goose Creek Plain, body sherds, oxidized, refit
6	70-80	7	19	3	Debitage	1	1.2	1/2", No cortex, Chert, Unheated
6	70-80	7	19	4	Debitage	2	18	3/4", Cortex, Chert, Unheated
6	70-80	7	19	5	Debitage	2	5.5	1/2", Cortex, Chert, Unheated
6	70-80	7	19	6	Debitage	8	2.5	1/4", No cortex, Chert, Unheated
6	70-80	7	19	7	Debitage	10	8.4	1/4", Cortex, Chert, Unheated
6	90-100	9	20	1	Debitage	1	0.1	1/4", Cortex, Chert, Heated
7	0-20	1	21	1	Debitage	1	0.3	1/4", Cortex, Chert, Unheated, Percussion Shatter
7	0-20	1	21	2	Debitage	1	0.4	1/4", Cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
7	0-20	1	21	3	Synthetic	1		orange plastic tape
7	0-20	1	21	4	Debitage	8	6.5	1/4", Cortex, Chert, Unheated
7	0-20	1	21	5	Debitage	9	4.2	1/4", No cortex, Chert, Unheated
7	20-30	2	22	1	Debitage	1	1.1	1/2", Cortex, Chert, Heated
7	20-30	2	22	2	Debitage	3	0.9	1/4", No cortex, Chert, Heated
7	20-30	2	22	3	Debitage	10	1	1/4", No cortex, Chert, Unheated
7	20-30	2	22	4	Debitage	12	4.5	1/4", Cortex, Chert, Unheated
7	30-40	3	23	1	Native American Ceramic	1		Goose Creek Plain, Body sherd
7	30-40	3	23	2	Native American Ceramic	2		Goose Creek Plain, Body sherd, organics incompletely eliminated
7	30-40	3	23	3	Debitage	3	0.6	1/4", Cortex, Chert, Heated
7	30-40	3	23	4	Debitage	5	0.4	1/4", No cortex, Chert, Heated
7	30-40	3	23	5	Debitage	16	6.5	1/4", Cortex, Chert, Unheated
7	30-40	3	23	6	Debitage	28	5.7	1/4", No cortex, Chert, Unheated
7	40-50	4	24	1	Debitage	1	0.9	1/2", No cortex, Chert, Unheated
7	40-50	4	24	2	Debitage	2	0.6	1/4", Cortex, Chert, Heated
7	40-50	4	24	3	Debitage	2	0.1	1/4", No cortex, Silicified Wood, Unheated
7	40-50	4	24	4	Debitage	3	9.5	1/2", Cortex, Chert, Unheated
7	40-50	4	24	5	Debitage	3	0.8	1/4", No cortex, Chert, Heated
7	40-50	4	24	6	Debitage	19	8.5	1/4", Cortex, Chert, Unheated
7	40-50	4	24	7	Debitage	44	12	1/4", No cortex, Chert, Unheated
7	50-60	5	25	1	Biface	1	2.9	Tool #13: Dart Preform Fragment
7	50-60	5	25	2	Burned Clay	1	2.6	Fragment
7	50-60	5	25	3	Native American Ceramic	1		Goose Creek Plain,Undecorated Body Sherd
7	50-60	5	25	4	Debitage	1	3.6	1/2", Cortex, Silicified Wood, Unheated
7	50-60	5	25	5	Debitage	1	0.6	1/2", No cortex, Chert, Unheated
7	50-60	5	25	6	Debitage	1	1.8	1/2", No cortex, Silicified Wood, Heated
7	50-60	5	25	7	Debitage	1	0.6	1/4", Cortex, Silicified Wood, Unheated
7	50-60	5	25	8	Debitage	1	1.2	1/4", No cortex, Silicified Wood, Unheated
7	50-60	5	25	9	Debitage	2	1.5	1/4", Cortex, Chert, Heated
7	50-60	5	25	10	Debitage	3	6.6	1/2", Cortex, Chert, Unheated
7	50-60	5	25	11	Debitage	6	1.7	1/4", No cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
7	50-60	5	25	12	Debitage	12	1.7	1/4", No Cortex, Chert, Unheated
7	50-60	5	25	13	Debitage	21	16	1/4", Cortex, Chert, Unheated
7	60-70	6	26	1	Dart Point	1	3	Tool # 14: Fragment
7	60-70	6	26	2	Debitage	1	1.4	1/4", Cortex, Chert, Unheated, Percussion Shatter
7	60-70	6	26	3	Debitage	1	1.3	1/4", Cortex, Chert, Heated, FCR/Shatter
7	60-70	6	26	4	Debitage	1	0.5	1/4", No cortex, Silicified Wood, Unheated
7	60-70	6	26	5	Debitage	3	8.8	1/2", Cortex, Chert, Unheated
7	60-70	6	26	6	Debitage	2	5.1	1/2", No cortex, Chert, Unheated
7	60-70	6	26	7	Debitage	5	1.3	1/4", No cortex, Chert, Heated
7	60-70	6	26	8	Debitage	14	13	1/4", Cortex, Chert, Unheated
7	60-70	6	26	9	Debitage	24	9.1	1/4", No cortex, Chert, Unheated
7	70-80	7	27	1	Debitage	3	7.4	1/2", Cortex, Chert, Unheated
8	0-20	1	28	1	Debitage	1	3.3	1/2", Cortex, Chert, Unheated
8	0-20	1	28	2	Debitage	5	3.1	1/4", Cortex, Chert, Unheated
8	0-20	1	28	3	Debitage	5	1.1	1/4", No cortex, Chert, Unheated
8	20-30	2	29	1	Debitage	1	0.1	1/4", No cortex, Chert, Heated
8	20-30	2	29	2	Debitage	2	0.6	1/4", Cortex, Chert, Heated
8	20-30	2	29	3	Debitage	7	3.5	1/4", Cortex, Chert, Unheated
8	20-30	2	29	4	Debitage	10	2.3	1/4", No cortex, Chert, Unheated
8	30-40	3	30	1	Native American Ceramic	1		Goose Creek Plain, rim sherd, organics incompletely eliminated, oxidized
8	30-40	3	30	2	Native American Ceramic	3		Goose Creek Plain, refit, possible rim sherd w/mending hole, oxidized
8	30-40	3	30	3	Debitage	2	0.6	1/4", No cortex, Silicified Wood, Unheated
8	30-40	3	30	4	Debitage	5	1.1	1/4", Cortex, Chert, Heated
8	30-40	3	30	5	Debitage	7	2	1/4", No cortex, Chert, Heated
8	30-40	3	30	6	Debitage	10	2	1/4", No cortex, Chert, Heated
8	30-40	3	30	7	Debitage	32	15	1/4", Cortex, Chert, Unheated
8	30-40	3	30	8	Debitage	62	12	1/4", No cortex, Chert, Unheated
8	40-50	4	31	1	Debitage	1	6	1/2", No cortex, Chert, Unheated
8	40-50	4	31	2	Debitage	2	4.5	1/2", Cortex, Chert, Unheated
8	40-50	4	31	3	Debitage	3	0.5	1/4", No cortex, Chert, Heated
8	40-50	4	31	4	Debitage	3	0.4	1/4", No cortex, Silicified Wood, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
8	40-50	4	31	5	Debitage	5	2.4	1/4", Cortex, Chert, Heated
8	40-50	4	31	6	Debitage	15	9.5	1/4", Cortex, Chert, Unheated
8	40-50	4	31	7	Debitage	49	12	1/4", No cortex, Chert, Unheated
8	50-60	5	32	1	Dart Point	1	8.9	
8	50-60	5	32	2	Native American Ceramic	2		Goose Creek Plain, body sherds, refit, organics incompletely eliminated
8	50-60	5	32	3	Debitage	1	0.2	1/4", No cortex, Quartzite, Unheated
8	50-60	5	32	4	Debitage	1	2.5	1/2", No cortex, Chert, Unheated
8	50-60	5	32	5	Debitage	4	2.1	1/4", Cortex, Chert, Heated
8	50-60	5	32	6	Debitage	4	14	1/2", Cortex, Chert, Unheated
8	50-60	5	32	7	Debitage	7	1.7	1/4", No cortex, Chert, Heated
8	50-60	5	32	8	Debitage	22	16	1/4", Cortex, Chert, Unheated
8	50-60	5	32	9	Debitage	29	8	1/4", No cortex, Chert, Unheated
8	60-70	6	33	1	Dart Point	1	7.8	Tool # 15: Godley- like
8	60-70	6	33	2	Debitage	1	2.1	1/2", Cortex, Chert, Heated
8	60-70	6	33	3	Debitage	1	7.8	1/2", No cortex, Chert, Heated, FCR/Shatter
8	60-70	6	33	4	Debitage	1	0.7	1/4", No cortex, Silicified Wood, Unheated
8	60-70	6	33	5	Debitage	3	8.1	1/2", Cortex, Chert, Unheated
8	60-70	6	33	6	Debitage	5	1.3	1/4", Cortex, Chert, Heated
8	60-70	6	33	7	Debitage	8	2.2	1/4", No cortex, Chert, Heated
8	60-70	6	33	8	Debitage	12	9.5	1/4", Cortex, Chert, Unheated
8	60-70	6	33	9	Debitage	14	4.8	1/4", No cortex, Chert, Unheated
8	70-80	7	34	1	Debitage	1	2.1	1/2", Cortex, Chert, Unheated
8	70-80	7	34	2	Debitage	2	1.1	1/4", Cortex, Chert, Unheated
9	0-20	1	35	1	Synthetic	1		orange plastic tape
9	0-20	1	35	2	Debitage	1	0.3	1/4", Cortex, Chert, Heated
9	0-20	1	35	3	Debitage	2	0.9	1/4", No cortex, Chert, Heated
9	0-20	1	35	4	Debitage	4	1.6	1/4", Cortex, Chert, Unheated
9	0-20	1	35	5	Debitage	7	1.1	1/4", No cortex, Chert, Unheated
9	20-30	2	36	1	Iron - Nail	1		Round Nail, heavily corroded
9	20-30	2	36	2	Debitage	1	1.3	1/2", Cortex, Chert, Unheated
9	20-30	2	36	3	Debitage	2	1.1	1/4", Cortex, Chert, Unheated
9	20-30	2	36	4	Debitage	4	0.3	1/4", No cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
9	30-40	3	37	1	Utilized Flake	1	0.8	
9	30-40	3	37	2	Debitage	1	1.3	1/2", Cortex, Chert, Unheated
9	30-40	3	37	3	Debitage	1	0.8	1/2", No cortex, Chert, Unheated
9	30-40	3	37	4	Debitage	1	1.6	1/2", No cortex, Chert, Heated
9	30-40	3	37	5	Debitage	2	1.2	1/4", Cortex, Chert, Heated
9	30-40	3	37	6	Debitage	2	0.1	1/4", No cortex, Silicified Wood, Unheated
9	30-40	3	37	7	Debitage	4	0.5	1/4", No cortex, Chert, Heated
9	30-40	3	37	8	Debitage	19	8	1/4", Cortex, Chert, Unheated
9	30-40	3	37	9	Debitage	33	4	1/4", No cortex, Chert, Unheated
9	40-50	4	38	1	Native American Ceramic	1	1	Goose Creek Plain, weathered, undecorated
9	40-50	4	38	2	Debitage	1	0.4	1/4", Cortex, Silicified Wood, Unheated
9	40-50	4	38	3	Debitage	1	0.2	1/4", No cortex, Quartzite, Unheated
9	40-50	4	38	4	Debitage	5	2.1	1/4", Cortex, Chert, Heated
9	40-50	4	38	5	Debitage	8	1.3	1/4", No cortex, Chert, Heated
9	40-50	4	38	6	Debitage	9	4.7	1/4", No cortex, Silicified Wood, Unheated
9	40-50	4	38	7	Debitage	22	20	1/4", Cortex, Chert, Unheated
9	40-50	4	38	8	Debitage	31	11	1/4", No cortex, Chert, Unheated
9	50-60	5	39	1	Core	1	33	Tool # 16: Chert
9	50-60	5	39	2	Biface	1	13	Tool # 17: Secondary Stage Biface, Chert
9	50-60	5	39	3	Native American Ceramic	1	0.6	Goose Creek Plain, weathered, undecorated, burned
9	50-60	5	39	4	Debitage	1	2	1/2", No cortex, Silicified Wood, Unheated
9	50-60	5	39	5	Debitage	1	1.7	1/4", Cortex, Chert, Heated, FCR/Shatter
9	50-60	5	39	6	Debitage	3	5.6	1/2", No cortex, Chert, Unheated
9	50-60	5	39	7	Debitage	3	0.5	1/4", No cortex, Silicified Wood, Unheated
9	50-60	5	39	8	Debitage	5	13	1/2", Cortex, Chert, Unheated
9	50-60	5	39	9	Debitage	7	1.1	1/4", No cortex, Chert, Heated
9	50-60	5	39	#	Debitage	8	3.8	1/4", Cortex, Chert, Heated
9	50-60	5	39	#	Debitage	15	9.6	1/4", Cortex, Chert, Unheated
9	50-60	5	39	#	Debitage	27	9	1/4", No cortex, Chert, Unheated
9	60-70	6	40	1	Debitage	1	1.2	1/4", Cortex, Quartzite, Unheated
9	60-70	6	40	2	Debitage	3	2.5	1/4", No cortex, Silicified Wood, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
9	60-70	6	40	3	Debitage	5	3.7	1/4", Cortex, Chert, Unheated
9	60-70	6	40	4	Debitage	7	6	1/4", Cortex, Chert, Heated
9	60-70	6	40	5	Debitage	8	7.2	1/4", No cortex, Chert, Unheated
9	70-80	7	41	1	Debitage	1	0.3	1/4", No cortex, Chert, Heated, FCR/Shatter
9	70-80	7	41	2	Debitage	1	1.3	1/4", Cortex, Chert, Unheated
10	0-20	1	42	1	Debitage	4	1	1/4", Cortex, Chert, Unheated
10	0-20	1	42	2	Debitage	2	0.3	1/4", No cortex, Chert, Unheated
10	20-30	2	43	1	Debitage	1	0.2	1/4", Cortex, Chert, Heated
10	20-30	2	43	2	Debitage	1	0.8	1/4", Cortex, Chert, Unheated
10	20-30	2	43	3	Debitage	3	0.7	1/4", No cortex, Chert, Heated
10	30-40	3	44	1	Native American Ceramic	1	8.3	Goose Creek Plain, burned, organics incompletely eliminated
10	30-40	3	44	2	Debitage	1	0.1	1/4", Cortex, Chert, Heated
10	30-40	3	44	3	Debitage	1	0.2	1/4", No cortex, Chert, Heated
10	30-40	3	44	4	Debitage	3	8.3	1/2", Cortex, Chert, Unheated
10	30-40	3	44	5	Debitage	14	8.1	1/4", Cortex, Chert, Unheated
10	30-40	3	44	6	Debitage	30	6.5	1/4", No cortex, Chert, Unheated
10	40-50	4	45	1	Native American Ceramic	1	3.5	Goose Creek Plain, undecorated sherd, oxidized, organics incompletely eliminated
10	40-50	4	45	2	Debitage	1	0.1	1/4", Cortex, Silicified Wood, Unheated
10	40-50	4	45	3	Debitage	1	0.1	1/4", Cortex, Chert, Heated
10	40-50	4	45	4	Debitage	1	2.2	1/2", No cortex, Chert, Unheated
10	40-50	4	45	5	Debitage	2	1.5	1/4", Cortex, Chert, Heated, FCR/Shatter
10	40-50	4	45	6	Debitage	2	5.2	1/2", Cortex, Chert, Unheated
10	40-50	4	45	7	Debitage	4	1.1	1/4", No cortex, Chert, Heated
10	40-50	4	45	8	Debitage	28	11	1/4", Cortex, Chert, Unheated
10	40-50	4	45	9	Debitage	42	9.3	1/4", No cortex, Chert, Unheated
10	50-60	5	46	1	Dart Point	1	4.6	Tool # 19: Palmillas
10	50-60	5	46	2	Utilized Flake	1	5	Tool # 18
10	50-60	5	46	3	Native American Ceramic	1	1.1	Goose Creek Plain, burned
10	50-60	5	46	4	Native American Ceramic	2	11	Goose Creek Plain, refit, oxidized
10	50-60	5	46	5	Debitage	1	5.9	3/4", Cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
10	50-60	5	46	6	Debitage	2	10	1/2", Cortex, Silicified Wood, Unheated
10	50-60	5	46	7	Debitage	2	4	1/2", No cortex, Chert, Unheated
10	50-60	5	46	8	Debitage	3	0.6	1/4", No cortex, Silicified Wood, Unheated
10	50-60	5	46	9	Debitage	3	6.2	1/2", Cortex, Chert, Unheated
10	50-60	5	46	10	Debitage	8	1.6	1/4", No cortex, Chert, Heated
10	50-60	5	46	11	Debitage	13	5.7	1/4", Cortex, Chert, Heated
10	50-60	5	46	12	Debitage	16	8.3	1/4", Cortex, Chert, Unheated
10	50-60	5	46	13	Debitage	45	10	1/4", No cortex, Chert, Unheated
10	60-70	6	47	1	Biface	1	16	Tool # 20: Dart preform fragment
10	60-70	6	47	2	Dart Point	1	3.6	Tool # 21: Kent, proximal fragment
10	60-70	6	47	3	Biface	1	9	Tool # 62: Secondary stage biface fragment
10	60-70	6	47	4	Natural Rock	1	32	Rock
10	60-70	6	47	5	Debitage	1	1.8	1/4", Cortex, Chert, Heated, FCR/Shatter
10	60-70	6	47	6	Debitage	1	0.9	1/4", Cortex, Chert, Unheated, Percussion Shatter
10	60-70	6	47	7	Debitage	1	0.2	1/4", Cortex, Chert, Heated
10	60-70	6	47	8	Debitage	7	23	1/2", Cortex, Chert, Unheated
10	60-70	6	47	9	Debitage	14	8.4	1/4", No cortex, Chert, Unheated
10	60-70	6	47	10	Debitage	23	22	1/4", Cortex, Chert, Unheated
10	70-80	7	48	1	Dart Point	1	7.1	Tool # 22: Kent
10	70-80	7	48	2	Debitage	1	0.9	1/4", Cortex, Chert, Heated
10	70-80	7	48	3	Debitage	1	0.3	1/4", No cortex, Chert, Heated
10	70-80	7	48	4	Debitage	2	9.1	1/2", Cortex, Chert, Unheated
10	70-80	7	48	5	Debitage	3	1.3	1/4", No cortex, Chert, Unheated
10	70-80	7	48	6	Debitage	4	2.8	1/4", Cortex, Chert, Unheated
11	0-20	1	49	1	Debitage	1	0.1	1/4", Cortex, Silicified Wood, Heated
11	0-20	1	49	2	Debitage	1	0.4	1/4", No Cortex, Silicified Wood, Heated
11	0-20	1	49	3	Debitage	6	1.3	1/4", No Cortex, Chert, Heated
11	0-20	1	49	4	Debitage	7	1.8	1/4", Cortex, Chert, Unheated
11	0-20	1	49	5	Debitage	9	1.4	1/4", No Cortex, Chert, Unheated
11	20-30	2	50	1	Bone - Faunal	7	5.3	Fragments
11	20-30	2	50	2	Utilized Flake	1	2.9	Tool # 23
11	20-30	2	50	3	Debitage	2	0.4	1/4", No Cortex, Chert, Heated
11	20-30	2	50	4	Debitage	4	0.8	1/4", No Cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
11	20-30	2	50	5	Charcoal	1	0.2	
11	30-40	3	51	1	Debitage	1	1.5	1/2", No Cortex, Chert, Unheated
11	30-40	3	51	2	Debitage	1	0.1	1/4", No Cortex, Non-local, Unheated
11	30-40	3	51	3	Debitage	2	1.8	1/4", Cortex, Silicified Wood, Unheated
11	30-40	3	51	4	Debitage	3	0.6	1/4", No Cortex, Chert, Heated
11	30-40	3	51	5	Debitage	3	6.9	1/2", Cortex, Chert, Unheated
11	30-40	3	51	6	Debitage	12	8.1	1/4", Cortex, Chert, Unheated
11	30-40	3	51	7	Debitage	17	5.7	1/4", No Cortex, Chert, Unheated
11	40-50	4	52	1	Dart Point	1	6.2	Tool # 25: Kent
11	40-50	4	52	2	Biface	1	5.7	Tool # 24: Dart preform fragment
11	40-50	4	52	3	Native American Ceramic	1	1.6	Goose Creek Plain, burned, undecorated sherd
11	40-50	4	52	4	Native American Ceramic	2	8.4	Goose Creek Plain,, undecorated sherds, organics incompletely eliminated
11	40-50	4	52	5	Debitage	1	4.3	3/4", No Cortex, Chert, Unheated
11	40-50	4	52	6	Debitage	1	0.5	1/4", No cortex, Chert, Heated, FCR/Shatter
11	40-50	4	52	7	Debitage	1	0.6	1/4", No Cortex, Silicified Wood, Heated
11	40-50	4	52	8	Debitage	2	4.3	1/2", No Cortex, Chert, Unheated
11	40-50	4	52	9	Debitage	4	4	1/4", Cortex, Chert, Heated
11	40-50	4	52	10	Debitage	6	1.3	1/4", No Cortex, Chert, Heated
11	40-50	4	52	11	Debitage	7	16	1/2", Cortex, Chert, Unheated
11	40-50	4	52	12	Debitage	16	17	1/4", Cortex, Chert, Unheated
11	40-50	4	52	13	Debitage	29	11	1/4", No Cortex, Chert, Unheated
11	50-60	5	53	1	Dart Point	1	1.5	Tool # 26: Proximal fragment, chert, untyped
11	50-60	5	53	2	Dart Point	1	7.3	Tool # 27: Ensor
11	50-60	5	53	3	Native American Ceramic	2	3.1	Goose Creek Plain, burned, refit, oxidized
11	50-60	5	53	4	Native American Ceramic	1	2.8	Goose Creek Plain, burned
11	50-60	5	53	5	Native American Ceramic	1	15	Goose Creek Plain, burned, undecorated sherd
11	50-60	5	53	6	Debitage	1	6.5	3/4", Cortex, Chert, Unheated
11	50-60	5	53	7	Debitage	1	2.1	3/4", No cortex, Chert, Unheated
11	50-60	5	53	8	Debitage	1	2.3	1/2", No cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
11	50-60	5	53	9	Debitage	1	1.5	1/2", No cortex, Chert, Heated
11	50-60	5	53	10	Debitage	1	0.1	1/4", Cortex, Silicified Wood, Unheated
11	50-60	5	53	11	Debitage	1	0.6	1/4", Cortex, Chert, Unheated, Percussion Shatter
11	50-60	5	53	12	Debitage	1	1.1	1/4", Cortex, Chert, Heated, FCR/Shatter
11	50-60	5	53	13	Debitage	2	10	1/2", Cortex, Chert, Unheated
11	50-60	5	53	14	Debitage	3	2.6	1/4", Cortex, Silicified Wood, Heated
11	50-60	5	53	15	Debitage	4	2	1/4", No cortex, Chert, Heated
11	50-60	5	53	16	Debitage	7	3.1	1/4", Cortex, Chert, Heated
11	50-60	5	53	17	Debitage	23	17	1/4", Cortex, Chert, Unheated
11	50-60	5	53	18	Debitage	23	9	1/4", No cortex, Chert, Unheated
11	50-60	5	53	19	Debitage	2	0.8	1/4", No cortex, Chert, Unheated
11	60-70	6	54	1	Biface	1	0.3	Tool # 29: Secondary stage biface fragment
11	60-70	6	54	2	Dart Point	1	1.5	Tool # 28: Fragment, indeterminate type
11	60-70	6	54	3	Dart Point	1	3	Tool # 30: untyped
11	60-70	6	54	4	Dart Point	1	5.8	Tool # 31: missing distal tip; Ellis-like
11	60-70	6	54	5	Dart Point	1	7.9	Tool # 32: Chert; Kent
11	60-70	6	54	6	Dart Point	1	6.4	Tool # 33: Chert, missing distal tip; Kent
11	60-70	6	54	7	Debitage	1	18	1", Cortex, Chert, Heated; small fragment broken off in bag
11	60-70	6	54	8	Debitage	2	16	3/4", Cortex, Chert, Heated
11	60-70	6	54	9	Debitage	2	15	3/4", Cortex, Chert, Unheated
11	60-70	6	54	10	Debitage	2	1.5	1/4", Cortex, Silicified Wood, Unheated
11	60-70	6	54	11	Debitage	3	4.4	1/2", No cortex, Chert, Unheated
11	60-70	6	54	12	Debitage	5	1.6	1/4", No cortex, Chert, Heated
11	60-70	6	54	13	Debitage	5	3.4	1/4", No cortex, Silicified Wood, Heated
11	60-70	6	54	14	Debitage	6	14	1/2", Cortex, Chert, Unheated
11	60-70	6	54	15	Debitage	7	5.6	1/4", Cortex, Chert, Heated
11	60-70	6	54	16	Debitage	21	12	1/4", Cortex, Chert, Unheated
11	60-70	6	54	17	Debitage	30	12	1/4", No cortex, Chert, Unheated
11	70-80	7	55	1	Dart Point	1	8.7	Tool # 34: Ellis-like
11	70-80	7	55	2	Dart Point	1	1.3	Tool # 35: Indeterminate distal tip fragment
11	70-80	7	55	3	Dart Point	1	3.8	Tool # 36: Kent
11	70-80	7	55	4	Debitage	1	21	3/4", Cortex, Chert, Unheated
11	70-80	7	55	5	Debitage	1	1.9	1/2", No cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
11	70-80	7	55	6	Debitage	1	1.4	1/4", Cortex, Chert, Heated
11	70-80	7	55	7	Debitage	4	12	1/2", Cortex, Chert, Unheated
11	70-80	7	55	8	Debitage	11	7.2	1/4", Cortex, Chert, Unheated
11	70-80	7	55	9	Debitage	12	5.4	1/4", No cortex, Chert, Unheated
11	70-80	7	55	10	Debitage	1	2.4	3/4", No cortex, Chert, Unheated
11	80-90	8	56	1	Debitage	2	2.4	1/4", No cortex, Chert, Unheated
11	90-100	9	57	1	Debitage	1	5.3	1/2", Cortex, Chert, Heated
11	90-100	9	57	2	Debitage	1	1.1	1/4", Cortex, Chert, Unheated
11	90-100	9	57	3	Debitage	2	0.5	1/4", No cortex, Chert, Unheated
11	110-120	11	58		Debitage	1	0.2	1/4", Cortex, Chert, Unheated
11	130-140	13	59	1	Native American Ceramic	1	7.2	Goose Creek Plain, heavily weathered sherd
11	130-140	13	59	2	Debitage	1	1.4	1/4", Cortex, Chert, Unheated
11	130-140	13	59	3	Debitage	1	0.1	1/4", No cortex, Chert, Unheated
11	140-150	14	60	1	Debitage	1	0.8	1/4", Cortex, Chert, Unheated
11	140-150	14	60	2	Debitage	2	1.4	1/4", No cortex, Chert, Unheated
12	0-20	1	61	1	Debitage	2	1.5	1/4", Cortex, Chert, Heated
12	0-20	1	61	2	Debitage	7	2.2	1/4", Cortex, Chert, Unheated
12	0-20	1	61	3	Debitage	16	2.9	1/4", No cortex, Chert, Unheated
12	0-20	1	61	4	Debitage	1	0.7	1/4", Cortex, Chert, Unheated
12	20-30	2	62	1	Bone - Faunal	1	6.7	Fragments
12	20-30	2	62	2	Debitage	1	0.1	1/4", Cortex, Chert, Heated
12	20-30	2	62	3	Debitage	2	0.4	1/4", Cortex, Chert, Unheated
12	20-30	2	62	4	Debitage	5	0.9	1/4", No cortex, Chert, Unheated
12	30-40	3	63	1	Native American Ceramic	1	0.7	Goose Creek Plain, burned
12	30-40	3	63	2	Debitage	1	2.5	1/2", Cortex, Chert, Heated
12	30-40	3	63	3	Debitage	1	0.1	1/4", No cortex, Silicified Wood, Unheated
12	30-40	3	63	4	Debitage	2	5.4	1/2", Cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
12	30-40	3	63	5	Debit age	2	3.3	1/2", No cortex, Chert, Unheated
12	30-40	3	63	6	Debitage	3	1.5	1/4", No cortex, Chert, Heated
12	30-40	3	63	7	Debitage	4	1.7	1/4", Cortex, Chert, Heated
12	30-40	3	63	8	Debitage	18	8.9	1/4", Cortex, Chert, Unheated
12	30-40	3	63	9	Debitage	23	9.7	1/4", No cortex, Chert, Unheated
12	40-50	4	64	1	Dart Point	1	2.1	Tool # 37: Medial fragment, chert, untyped
12	40-50	4	64	2	Debitage	1	16	1", Cortex, Silicified Wood, Unheated
12	40-50	4	64	3	Debitage	1	2.2	1/2", Cortex, Chert, Heated
12	40-50	4	64	4	Debitage	1	4.7	1/2", No cortex, Chert, Unheated
12	40-50	4	64	5	Debitage	1	0.2	1/4", Cortex, Silicified Wood, Unheated
12	40-50	4	64	6	Debitage	1	0.1	1/4", Cortex, Chert, Heated
12	40-50	4	64	7	Debitage	3	1.5	1/4", Cortex, Chert, Indeterminate heating
12	40-50	4	64	8	Debitage	4	1.2	1/4", No cortex, Silicified Wood, Unheated
12	40-50	4	64	9	Debitage	5	17	1/2", Cortex, Chert, Unheated
12	40-50	4	64	10	Debitage	5	2.2	1/4", No cortex, Chert, Heated
12	40-50	4	64	11	Debitage	22	11	1/4", No cortex, Chert, Unheated
12	40-50	4	64	12	Debitage	29	21	1/4", Cortex, Chert, Unheated
12	50-60	5	65	1	Dart Point	1	3.3	Tool # 38: Gary
12	50-60	5	65	2	Dart Point	1	2.9	Tool # 39: Gary
12	50-60	5	65	3	Dart Point	1	3	Tool # 40: Gary
12	50-60	5	65	4	Dart Point	1	2.6	Tool # 41: Gary
12	50-60	5	65	5	Debitage	1	3.3	1/2", No cortex, Chert, Heated
12	50-60	5	65	6	Debitage	2	9.3	1/2", Cortex, Chert, Unheated
12	50-60	5	65	7	Debitage	2	2.1	1/2", No cortex, Chert, Unheated
12	50-60	5	65	8	Debitage	2	1.2	1/4", Cortex, Chert, Heated
12	50-60	5	65	9	Debitage	4	0.7	1/4", No cortex, Chert, Heated
12	50-60	5	65	10	Debitage	6	2.8	1/4", Cortex, Silicified Wood, Unheated
12	50-60	5	65	11	Debitage	14	9.4	1/4", Cortex, Chert, Unheated
12	50-60	5	65	12	Debitage	24	7.5	1/4", No cortex, Chert, Unheated
12	60-70	6	66	1	Native American Ceramic	1	0.4	Goose Creek Plain, organics incompletely eliminated
12	60-70	6	66	2	Native American Ceramic	1	3.9	Goose Creek Plain, oxidized

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
12	60-70	6	66	3	Native American Ceramic	1	1.1	Goose Creek Plain, organics incompletely eliminated
12	60-70	6	66	4	Debitage	2	8.3	1/2", Cortex, Chert, Unheated
12	60-70	6	66	5	Debitage	2	3.2	1/2", No cortex, Chert, Unheated
12	60-70	6	66	6	Debitage	3	0.9	1/4", No cortex, Silicified Wood, Unheated
12	60-70	6	66	7	Debitage	4	4	1/4", Cortex, Chert, Heated
12	60-70	6	66	8	Debitage	5	1.9	1/4", No cortex, Chert, Heated
12	60-70	6	66	9	Debitage	18	6.6	1/4", No cortex, Chert, Unheated
12	60-70	6	66	10	Debitage	20	16	1/4", Cortex, Chert, Unheated
12	70-80	7	67	1	Debitage	1	2.3	1/2", No cortex, Chert, Unheated
12	70-80	7	67	2	Debitage	2	5.2	1/2", Cortex, Chert, Unheated
12	70-80	7	67	3	Debitage	2	1.8	1/4", Cortex, Chert, Heated
12	70-80	7	67	4	Debitage	2	1.3	1/4", No cortex, Chert, Heated
12	70-80	7	67	5	Debitage	6	5.7	1/4", Cortex, Chert, Unheated
12	70-80	7	67	6	Debitage	7	2.7	1/4", No cortex, Chert, Unheated
12	80-90	8	68	1	Native American Ceramic	2	5.1	Goose Creek Plain, organics incompletely eliminated, refit
12	80-90	8	68	2	Debitage	1	3.1	1/2", Cortex, Chert, Unheated
12	80-90	8	68	3	Debitage	1	0.2	1/4", No cortex, Chert, Unheated
12	155	ST	69	1	Debitage	1	0.7	Not scaled, Cortex, Chert, Unheated; ST at bottom of unit 12, 65 cm from bottom of unit
13	0-25	1	70	1	Debitage	6	2.3	1/4", Cortex, Chert, Unheated
13	0-20	1	70	2	Debitage	2	0.5	1/4", Cortex, Chert, Heated
13	0-20	1	70	3	Bone - Faunal	4	7.8	Fragments
13	0-20	1	70	3	Debitage	9	2	1/4", No cortex, Chert, Unheated
13	20-30	2	71	1	Bone - Faunal	1	0.4	Fragments
13	20-30	2	71	2	Debitage	1	0.1	1/4", Cortex, Silicified Wood, Unheated
13	20-30	2	71	3	Debitage	1	0.1	1/4", No cortex, Quartzite, Unheated
13	20-30	2	71	4	Debitage	4	0.9	1/4", Cortex, Chert, Unheated
13	20-30	2	71	5	Debitage	5	1.1	1/4", No cortex, Chert, Unheated
13	20-30	2	71	6	Brick	3	12	Fragments
13	30-40	3	72	1	Dart Point	1	0.6	Tool # 42: Chert point distal fragment, untypable
13	30-40	3	72	2	Bone - Faunal	2	4.1	Fragments
13	30-40	3	72	3	Debitage	1	0.4	1/4", Cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
13	30-40	3	72	4	Debitage	1	1.1	1/4", No cortex, Silicified Wood, Unheated
13	30-40	3	72	5	Debitage	7	3.1	1/4", Cortex, Chert, Unheated
13	30-40	3	72	6	Debitage	8	1.2	1/4", No cortex, Chert, Heated
13	30-40	3	72	7	Debitage	19	3	1/4", No cortex, Chert, Unheated
13	30-40	3	72	8	Charcoal	3	0.2	
13	40-50	4	73	1	Native American Ceramic	1	5.8	Goose Creek Plain, burned, undecorated sherd
13	40-50	4	73	2	Debitage	1	0.1	1/4", No cortex, Silicified Wood, Unheated
13	40-50	4	73	3	Debitage	3	0.8	1/4", Cortex, Chert, Heated
13	40-50	4	73	4	Debitage	6	1.4	1/4", No cortex, Chert, Heated
13	40-50	4	73	5	Debitage	21	11	1/4", Cortex, Chert, Unheated
13	40-50	4	73	6	Debitage	31	8.1	1/4", No cortex, Chert, Unheated
13	50-60	5	74	1	Debitage	1	1.5	1/2", Cortex, Chert, Unheated
13	50-60	5	74	2	Debitage	1	2.2	1/2", Cortex, Silicified Wood, Unheated
13	50-60	5	74	3	Debitage	3	4.8	1/2", No cortex, Chert, Unheated
13	50-60	5	74	4	Debitage	3	0.8	1/4", Cortex, Chert, Heated
13	50-60	5	74	5	Debitage	3	0.8	1/4", No cortex, Chert, Heated
13	50-60	5	74	6	Debitage	16	11	1/4", Cortex, Chert, Unheated
13	50-60	5	74	7	Debitage	29	8	1/4", No cortex, Chert, Unheated
13	60-70	6	75	1	Dart Point	1	1.3	Tool # 43: Point fragment, proximal end (base)
13	60-70	6	75	2	Dart Point	1	5.5	Tool # 44: Gary
13	60-70	6	75	3	Utilized Flake	1	0.9	Tool # 45: chert
13	60-70	6	75	4	Biface	1	20	Tool # 46: Chert, initial stage
13	60-70	6	75	5	Debitage	1	0.7	1/4", Cortex, Silicified Wood, Unheated
13	60-70	6	75	6	Debitage	1	0.3	1/4", No cortex, Silicified Wood, Heated
13	60-70	6	75	7	Debitage	1	0.1	1/4", No cortex, Silicified Wood, Unheated
13	60-70	6	75	8	Debitage	3	13	1/2", Cortex, Chert, Unheated
13	60-70	6	75	9	Debitage	7	14	1/2", No cortex, Chert, Unheated
13	60-70	6	75	10	Debitage	8	6.4	1/4", Cortex, Chert, Heated
13	60-70	6	75	11	Debitage	10	4.5	1/4", No cortex, Chert, Heated
13	60-70	6	75	12	Debitage	20	14	1/4", Cortex, Chert, Unheated
13	60-70	6	75	13	Debitage	34	15	1/4", No cortex, Chert, Unheated
13	70	6	75	14	Charcoal	3	1	Weighed in foil

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
13	70-80	7	76	1	Debitage	1	9.5	3/4", Cortex, Chert, Unheated
13	70-80	7	76	2	Debitage	1	0.4	1/4", Cortex, Silicified Wood, Unheated
13	70-80	7	76	3	Debitage	1	0.7	1/4", No cortex, Chert, Heated
13	70-80	7	76	4	Debitage	1	1.6	1/4", No cortex, Silicified Wood, Unheated
13	70-80	7	76	5	Debitage	2	1.5	1/4", Cortex, Chert, Heated
13	70-80	7	76	6	Debitage	5	8.4	1/2", No cortex, Chert, Unheated
13	70-80	7	76	7	Debitage	7	17	1/2", Cortex, Chert, Unheated
13	70-80	7	76	8	Debitage	7	6.6	1/4", Cortex, Chert, Unheated
13	70-80	7	76	9	Debitage	17	9.8	1/4", No cortex, Chert, Unheated
14	0-20	1	77	1	Debitage	1	0.2	1/4", No cortex, Chert, Heated
14	0-20	1	77	2	Debitage	3	0.7	1/4", No cortex, Silicified Wood, Unheated
14	0-20	1	77	3	Debitage	5	2.2	1/4", Cortex, Chert, Unheated
14	0-20	1	77	4	Debitage	6	1.2	1/4", No cortex, Chert, Unheated
14	20-30	2	78	1	Debitage	5	0.5	1/4", No cortex, Chert, Unheated
14	30-40	3	79	1	Debitage	2	0.4	1/4", No cortex, Chert, Heated
14	30-40	3	79	2	Debitage	5	1.9	1/4", Cortex, Chert, Heated
14	30-40	3	79	3	Debitage	20	9.6	1/4", Cortex, Chert, Unheated
14	30-40	3	79	4	Debitage	24	5.2	1/4", No cortex, Chert, Unheated
14	40-50	4	80	1	Native American Ceramic	1	12	Goose Creek Plain, charred on interior
14	40-50	4	80	2	Dart Point	1	5	Tool # 47: Kent, missing distal tip
14	40-50	4	80	3	Debitage	2	9.9	3/4", Cortex, Chert, Unheated
14	40-50	4	80	4	Debitage	3	7.5	1/2", Cortex, Chert, Unheated
14	40-50	4	80	5	Debitage	3	3.6	1/2", No cortex, Chert, Unheated
14	40-50	4	80	6	Debitage	4	2.8	1/4", Cortex, Chert, Heated
14	40-50	4	80	7	Debitage	4	1.3	1/4", No cortex, Silicified Wood, Unheated
14	40-50	4	80	8	Debitage	11	2	1/4", No cortex, Chert, Heated
14	40-50	4	80	9	Debitage	14	8.2	1/4", Cortex, Chert, Unheated
14	40-50	4	80	10	Debitage	25	7.4	1/4", No cortex, Chert, Unheated
14	40-50	4	80	11	Debitage	1	0.9	1/4", No cortex, Quartzite, Unheated
14	50-60	5	81	1	Debitage	1	2.2	1/2", Cortex, Chert, Unheated
14	50-60	5	81	2	Debitage	1	0.1	1/4", No cortex, Silicified Wood, Unheated
14	50-60	5	81	3	Debitage	3	0.9	1/4", Cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
14	50-60	5	81	4	Debitage	8	5.5	1/4", Cortex, Chert, Unheated
14	50-60	5	81	5	Debitage	9	2.2	1/4", No cortex, Chert, Heated
14	50-60	5	81	6	Debitage	21	5.1	1/4", No cortex, Chert, Unheated
14	60-70	6	82	1	Dart Point	1	6	Tool # 49: Yarbrough, proximal end
14	60-70	6	82	2	Retouched Flake	1	2.1	Tool # 48: Chert
14	60-70	6	82	3	Debitage	1	6	1/2", Cortex, Silicified Wood, Unheated
14	60-70	6	82	4	Debitage	1	0.6	1/4", No cortex, Silicified Wood, Unheated
14	60-70	6	82	5	Debitage	4	1.7	1/4", Cortex, Chert, Heated
14	60-70	6	82	6	Debitage	5	19	1/2", Cortex, Chert, Unheated
14	60-70	6	82	7	Debitage	8	4.3	1/4", Cortex, Chert, Unheated
14	60-70	6	82	8	Debitage	25	10	1/4", No cortex, Chert, Unheated
14	70-80	7	83	1	Dart Point	1	6	Tool # 50: untyped dart point
14	70-80	7	83	2	Biface	1	7.6	Tool # 51: Initial stage biface fragment
14	70-80	7	83	3	Utilized Flake	1	5.6	Tool # 52
14	70-80	7	83	4	Debris	2	21	lithic material
14	70-80	7	83	5	Native American Ceramic	2	1	Goose Creek Plain, burned; refit on fresh break
14	70-80	7	83	6	Native American Ceramic	3	2.2	Goose Creek Plain, organics incompletely eliminated
14	70-80	7	83	7	Debitage	1	1	1/4", No cortex, Silicified Wood, Unheated
14	70-80	7	83	8	Debitage	3	9.7	1/2", No cortex, Chert, Unheated
14	70-80	7	83	9	Debitage	5	14	1/2", Cortex, Chert, Unheated
14	70-80	7	83	10	Debitage	5	2.3	1/4", No cortex, Chert, Heated
14	70-80	7	83	11	Debitage	7	4.7	1/4", Cortex, Chert, Heated
14	70-80	7	83	12	Debitage	10	5.3	1/4", No cortex, Chert, Unheated
14	70-80	7	83	13	Debitage	13	9.7	1/4", Cortex, Chert, Unheated
14	80-90	8	84	1	Debitage	4	5.6	1/4", Cortex, Chert, Unheated
14	80-90	8	84	2	Debitage	1	0.4	1/4", No cortex, Chert, Unheated
15	0-20	1	85	1	Debitage	4	2	1/4", Cortex, Chert, Unheated
15	0-20	1	85	2	Debitage	13	3.9	1/4", No cortex, Chert, Unheated
15	0-20	1	85	3	Debitage	1	0.1	1/4", No cortex, Chert, Heated
15	20-30	2	86	1	Curved Glass - Amber	1	0.2	Amber fragment
15	20-30	2	86	2	Debitage	2	0.4	1/4", Cortex, Chert, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
15	30-40	3	87	1	Debitage	1	0.2	1/4", No cortex, Silicified Wood, Unheated
15	30-40	3	87	2	Debitage	3	0.4	1/4", Cortex, Chert, Unheated
15	30-40	3	87	3	Debitage	4	0.6	1/4", No cortex, Chert, Heated
15	30-40	3	87	4	Debitage	29	4.6	1/4", No cortex, Chert, Unheated
15	40-50	4	88	1	Native American Ceramic	1	2.1	Goose Creek Plain, oxidized
15	40-50	4	88	2	Debitage	3	5.4	1/2", No cortex, Chert, Unheated
15	40-50	4	88	3	Debitage	4	0.9	1/4", Cortex, Chert, Heated
15	40-50	4	88	4	Debitage	4	0.6	1/4", No cortex, Chert, Heated
15	40-50	4	88	5	Debitage	33	19	1/4", Cortex, Chert, Unheated
15	40-50	4	88	6	Debitage	52	11	1/4", No cortex, Chert, Unheated
15	50-60	5	89	1	Biface	1	22	Tool # 53: Primary stage biface
15	50-60	5	89	2	Dart Point	1	1.1	Tool # 54: Dart point fragment, untyped, chert
15	50-60	5	89	3	Utilized Flake	1	14	Tool # 55: Chert
15	50-60	5	89	4	Debitage	1	0.9	1/4", No cortex, Silicified Wood, Unheated
15	50-60	5	89	5	Debitage	3	1.2	1/4", Cortex, Chert, Heated
15	50-60	5	89	6	Debitage	6	24	1/2", Cortex, Chert, Unheated
15	50-60	5	89	7	Debitage	9	3.2	1/4", No cortex, Chert, Heated
15	50-60	5	89	8	Debitage	11	12	1/4", Cortex, Chert, Unheated
15	50-60	5	89	9	Debitage	36	18	1/4", No cortex, Chert, Unheated
15	60-70	6	90	1	Projectile Point	1	0.5	Broken base, chert
15	60-70	6	90	2	Biface	1	8.8	Fragments
15	60-70	6	90	3	Biface	1	11	Tool # 56: Secondary stage, chert
15	60-70	6	90	4	Utilized Flake	1	5.8	Tool # 57: Chert
15	60-70	6	90	5	Utilized Flake	1	5.8	Tool #58: chert
15	60-70	6	90	6	Debitage	1	29	1", Cortex, Chert, Heated
15	60-70	6	90	7	Debitage	1	4.2	1/2", Cortex, Silicified Wood, Unheated
15	60-70	6	90	8	Debitage	1	11	1/2", Cortex, Quartzite, Heated
15	60-70	6	90	9	Debitage	1	2.4	1/2", No cortex, Silicified Wood, Unheated
15	60-70	6	90	10	Debitage	1	1.3	1/4", Cortex, Chert, Heated
15	60-70	6	90	11	Debitage	2	6.9	1/2", Cortex, Chert, Heated
15	60-70	6	90	12	Debitage	3	5	1/4", Cortex, Silicified Wood, Unheated
15	60-70	6	90	13	Debitage	5	2.4	1/4", No cortex, Silicified Wood, Unheated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
15	60-70	6	90	14	Debitage	6	11	1/2", No cortex, Chert, Unheated
15	60-70	6	90	15	Debitage	9	24	1/2", Cortex, Chert, Unheated
15	60-70	6	90	16	Debitage	9	4.5	1/4", No cortex, Chert, Heated
15	60-70	6	90	17	Debitage	11	5.8	1/4", No cortex, Chert, Unheated
15	60-70	6	90	18	Debitage	20	15	1/4", Cortex, Chert, Unheated
15	70-80	7	91	1	Dart Point	1	5.1	Tool #59: Kent
15	70-80	7	91	2	Debitage	1	1	1/2", No cortex, Silicified Wood, Unheated
15	70-80	7	91	3	Debitage	1	2.6	1/4", Cortex, Chert, Heated
15	70-80	7	91	4	Debitage	2	4.5	1/2", Cortex, Chert, Heated
15	70-80	7	91	5	Debitage	3	0.8	1/4", No cortex, Silicified Wood, Unheated
15	70-80	7	91	6	Debitage	4	8.3	1/2", No cortex, Chert, Unheated
15	70-80	7	91	7	Debitage	6	23	1/2", Cortex, Chert, Unheated
15	70-80	7	91	8	Debitage	9	3	1/4", No cortex, Chert, Heated
15	70-80	7	91	9	Debitage	10	8.9	1/4", Cortex, Chert, Unheated
15	70-80	7	91	10	Debitage	16	11	1/4", No cortex, Chert, Unheated
15	80-90	8	92	1	Debitage	1	4.2	1/2", Cortex, Chert, Unheated
15	80-90	8	92	2	Debitage	1	1.5	1/2", No cortex, Chert, Unheated
15	80-90	8	92	3	Debitage	1	0.4	1/4", No cortex, Chert, Unheated
15	80-90	8	92	4	Debitage	3	3.1	1/4", Cortex, Chert, Unheated
16	0-20	1	93	1	Debitage	3	0.8	1/4", Cortex, Chert, Unheated
16	0-20	1	93	2	Debitage	2	0.7	1/4", No cortex, Chert, Heated
16	0-20	1	93	3	Debitage	9	1.7	1/4", No cortex, Chert, Unheated
16	20-30	2	94	1	Debitage	1	0.6	1/4", No cortex, Chert, Unheated
16	20-30	2	94	2	Debitage	1	0.2	1/4", No cortex, Chert, Heated
16	20-30	2	94	3	Debitage	2	0.8	1/4", Cortex, Chert, Unheated
16	30-40	3	95	1	Debitage	1	0.6	1/4", No cortex, Silicified Wood, Unheated
16	30-40	3	95	2	Debitage	3	3	1/4", Cortex, Chert, Heated
16	30-40	3	95	3	Debitage	5	2.9	1/4", No cortex, Chert, Heated
16	30-40	3	95	4	Debitage	10	11	1/4", Cortex, Chert, Unheated
16	30-40	3	95	5	Debitage	12	2.9	1/4", No cortex, Chert, Unheated
16	30-40	3	95	6	Debitage	1	0.1	1/4", No cortex, Quartzite, Heated
16	40-50	4	96	1	Debitage	1	2.6	1/2", Cortex, Chert, Unheated
16	40-50	4	96	2	Debitage	3	0.5	1/4", No cortex, Chert, Heated

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
16	40-50	4	96	3	Debitage	4	7.2	1/2", Cortex, Chert, Heated
16	40-50	4	96	4	Debitage	4	2.5	1/4", Cortex, Chert, Heated
16	40-50	4	96	5	Debitage	9	6.2	1/4", Cortex, Chert, Unheated
16	40-50	4	96	6	Debitage	28	6.4	1/4", No cortex, Chert, Unheated
16	50-60	5	97	1	Debitage	1	11	1/2", Cortex, Chert, Unheated, Percussion Shatter
16	50-60	5	97	2	Debitage	1	0.6	1/4", No cortex, Chert, Unheated, Percussion Shatter
16	50-60	5	97	3	Debitage	5	0.8	1/4", No cortex, Chert, Heated
16	50-60	5	97	4	Debitage	8	5.6	1/4", Cortex, Chert, Heated
16	50-60	5	97	5	Debitage	11	3.9	1/4", No cortex, Chert, Unheated
16	50-60	5	97	6	Debitage	13	11	1/4", Cortex, Chert, Unheated
16	50-60	5	97	7	Debitage	1	12	1/2", Cortex, Chert, Heated
16	50-60	5	97	8	Debitage	1	17	1/2", Cortex, Chert, Heated, Percussion Shatter
16	50-60	5	97	9	Debitage	1	1.6	1/4", Percussion Shatter
16	50-60	5	97	10	Debitage	2	2.7	3/4", No cortex, Chert, Unheated
16	50-60	5	97	11	Debitage	4	1.6	1/4", Cortex, Chert, Heated
16	50-60	5	97	12	Debitage	6	4.6	1/4", Cortex, Chert, Unheated
16	50-60	5	97	13	Natural Rock	1	19	
16	60-70	6	98	1	Dart Point	1	10	Tool # 60: Bulverde
16	60-70	6	98	2	Debitage	1	4.8	3/4", Cortex, Chert, Unheated
16	60-70	6	98	3	Debitage	2	3.8	1/2", No cortex, Chert, Unheated
16	60-70	6	98	4	Debitage	2	0.6	1/4", Cortex, Chert, Heated
16	60-70	6	98	5	Debitage	8	6.5	1/4", Cortex, Chert, Unheated
16	60-70	6	98	6	Debitage	13	6.4	1/4", No cortex, Chert, Unheated
16	60-70	6	98	7	Debitage	1	27	1", Cortex, Quartzite, Unheated, Percussion Shatter
16	70-80	7	99	1	Chopper	1	91	Tool # 61: chert
16	70-80	7	99	2	Debitage	1	5.3	1/2", Cortex, Quartzite, Heated
16	70-80	7	99	3	Debitage	4	13	1/2", Cortex, Chert, Unheated
16	70-80	7	99	4	Debitage	4	4.3	1/4", Cortex, Chert, Unheated
16	70-80	7	99	5	Debitage	4	1.5	1/4", No cortex, Chert, Heated
16	70-80	7	99	6	Debitage	5	1.8	1/4", No cortex, Chert, Unheated
16	70-80	7	99	7	Debitage	9	3.9	1/4", Cortex, Chert, Heated
11-14	n/a	n/a	100	1	Burned Clay	1	42	Fragments

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
11-14	n/a	n/a	100	2	Debitage	1	2	1/2", Cortex, Chert, Unheated
11-14	n/a	n/a	100	3	Debitage	2	4.9	1/2", No Cortex, Chert, Unheated
11-14	n/a	n/a	100	4	Debitage	5	4.2	1/4", Cortex, Chert, Unheated
11-14	n/a	n/a	100	5	Debitage	17	6.3	1/4", No Cortex, Chert, Unheated
11,12	n/a	n/a	101	1	Debitage	1	2.3	1/4", Cortex, Chert, Heated; N wall clean-up
11,12	n/a	n/a	101	2	Debitage	1	0.3	1/4", Cortex, Chert, Unheated; N wall clean-up
11,12	n/a	n/a	101	3	Debitage	5	2.5	1/4", No Cortex, Chert, Unheated; N wall clean-up
11, 13, 15	n/a	n/a	102	1	Debitage	1	3.5	1/2", Cortex, Chert, Unheated; W wall clean
11, 13, 15	n/a	n/a	102	2	Debitage	1	2.2	1/2", No Cortex, Chert, Unheated; W wall clean
11, 13, 15	n/a	n/a	102	3	Debitage	1	0.4	1/4", Cortex, Chert, Unheated; W wall clean
11, 13, 15	n/a	n/a	102	4	Debitage	4	4.3	1/4", No Cortex, Chert, Unheated; W wall clean
14,16	n/a	n/a	103	1	Debitage	1	5	1/2", Cortex, Chert, Heated; E wall clean-up
14,16	n/a	n/a	103	2	Debitage	1	1	1/4", Cortex, Chert, Unheated; E wall clean-up
15,16	n/a	n/a	104	1	Debitage	2	2.9	1/4", Cortex, Chert, Unheated; S wall clean-up
15,16	n/a	n/a	104	2	Debitage	1	0.1	1/4", No Cortex, Chert, Unheated; S wall clean-up
5,6	n/a	n/a	105	1	Debitage	1	1.4	1/2", No Cortex, Chert, Heated; N wall clean
5-8	n/a	n/a	106	1	Debitage	2	3.2	1/2", Cortex, Chert, Heated; Wash out
5-8	n/a	n/a	106	2	Debitage	7	3.1	1/4", Cortex, Chert, Heated; Wash out
5-8	n/a	n/a	106	3	Debitage	8	6.9	1/4", Cortex, Chert, Unheated; Wash out
5-8	n/a	n/a	106	4	Debitage	2	0.2	1/4", No Cortex, Chert, Heated; Wash out
5-8	n/a	n/a	106	5	Debitage	6	1	1/4", No Cortex, Chert, Unheated; Wash out
5-8	n/a	n/a	106	6	Bone - Faunal	1	0.1	Fragments; Wash out

Unit	Depth (cmbs)	Level	Lot	Specimen	Artifact Category	Ct.	Wt. (g)	Description
7,8	n/a	n/a	107	1	Biface	1	4.4	Medial fragment; Wall slump from XU 7 & 8, taken from floor of XU 5
7,8	n/a	n/a	107	2	Debris	1	0.4	Wall slump from XU 7 & 8, taken from floor of XU 5
7,8	n/a	n/a	107	3	Debitage	2	1.3	1/4", Cortex, Chert, Unheated; Wall slump from XU 7 & 8, taken from floor of XU 5
7,8	n/a	n/a	107	4	Debitage	1	0.1	1/4", No Cortex, Chert, Heated; FCR/ Shatter; Wall slump from XU 7 & 8, taken from floor of XU 5
7,8	n/a	n/a	107	5	Debitage	15	6.4	1/4", No Cortex, Chert, Unheated; Wall slump from XU 7 & 8, taken from floor of XU 5
7,9	n/a	n/a	108	1	Debitage	2	0.5	1/4", Cortex, Chert, Unheated; wall clean-up
7,9	n/a	n/a	108	2	Debitage	2	0.2	1/4", No Cortex, Chert, Unheated; wall clean-up
8,10	n/a	n/a	109	1	Debitage	5	4.9	1/4", Cortex, Chert, Unheated; E wall
8,10	n/a	n/a	109	2	Debitage	1	0.1	1/4", No Cortex, Chert, Unheated; E wall