Archeological Survey within the Chickasaw National Recreation Area, Murray County, Oklahoma

By
Alan J. Osborn
Ralph J. Hartley

Midwest Archeological Center
Technical Report No. 108

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This report has been reviewed against the criteria contained in 43CFR Part 7, Subpart A, Section 7.18 (a) (1) and, upon recommendation of the Midwest Regional Office and the Midwest Archeological Center, has been classified as

Available

Making the report available meets the criteria of 43CFR Part 7, Subpart A, Section 7.18 (a) (1).

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PART I. INTRODUCTION

Introduction

The Midwest Archeological Center (MWAC), National Park Service in Lincoln, Nebraska was contacted by the staff of the Chickasaw National Recreation Area in Sulphur, Oklahoma to request assistance in the completion of an archeological survey of areas that would be impacted by future renovations, rehabilitations, and upgrades of facilities within Chickasaw NRA. These projects include: 1) installation and/or replacement of twenty-two 18' steel culverts along back country roads; 2) the installation of thirteen vault toilets; 3) rehabilitation of the comfort station near Buffalo Springs; 4) installation of a electrical conduit and solar panel at Antelope Springs; 5) upgrade of roads and modification of picnic areas within the Platt Historic District; 6) rehabilitation of berms and drainage features at Pavilion Springs; and, 7) renovation of eroded portions of Rock Creek multi-use Trail No.1. Archeologists from MWAC carried out the survey and monitoring associated with these projects between June 23-29, 2008. This report provides a description of the project area and location; pertinent background information; the nature of the proposed renovation and rehabilitation projects; and the results of the archeological survey(s) and auger tests conducted within Chickasaw NRA.

Project Area and Location

The Chickasaw National Recreation Area is located in Murray County, Oklahoma within a triangular area formed by Davis (northwest), Sulphur (northeast), and Dougherty (south-central) (Figure 1). The NRA centers on 34°26' N. latitude and 97°01' W. longitude

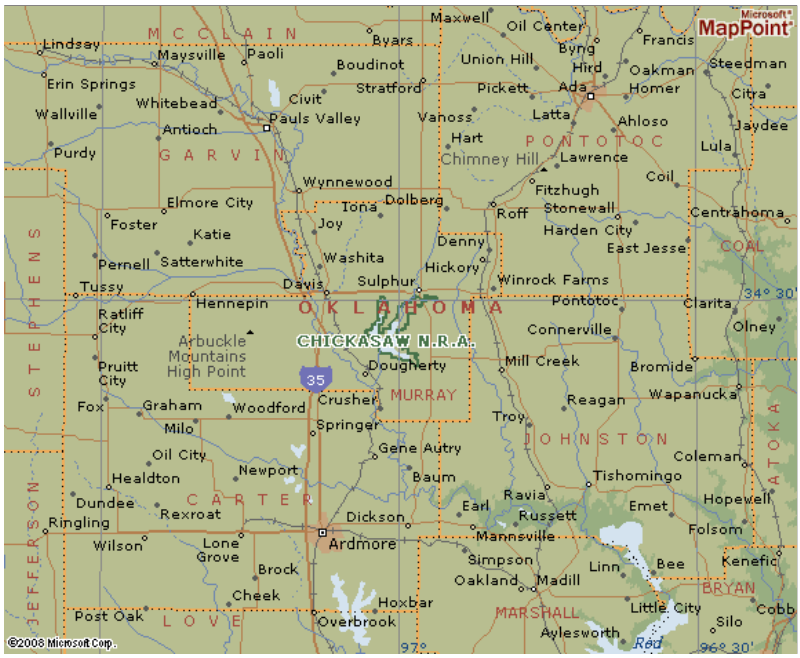

Figure 1. Location of Chickasaw National Recreation Area, Murray County, Oklahoma (from Encarta.asn.com)

(Figure 2). Its maximum north-south length equals 11.43 km (7 mi) and its maximum width equals 12.8 km (8 mi). The total area within the NRA equals 40.02 km^2 (9,888.83 acres) and the Lake of the Arbuckles that lies at the confluence of Guy Sandy and Rock Creeks covers 9.75 km^2 (2,409 acres). Elevations within the NRA range from 259.08 m (850') asl in the south to 326.136 m (1070') asl in the north.

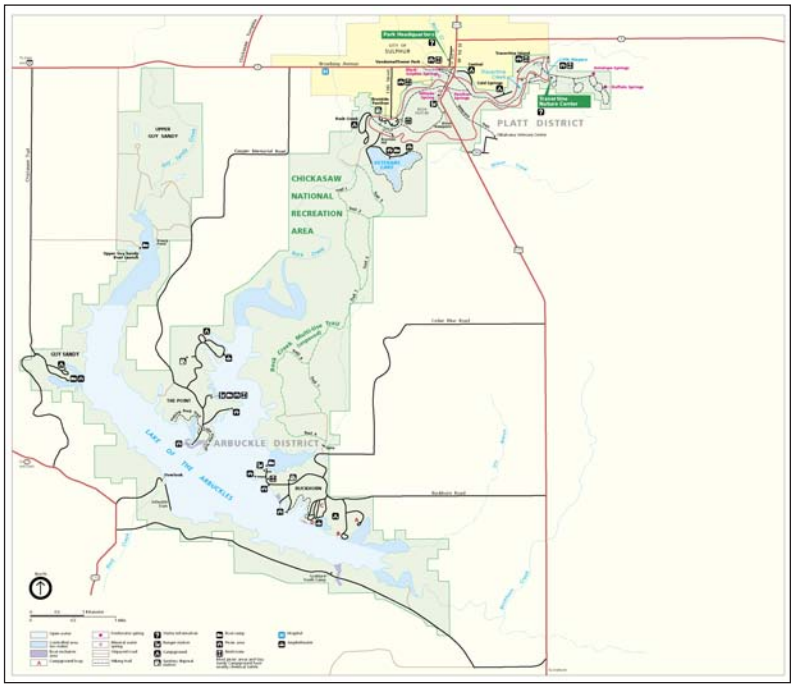

Figure 2. Map of the Chickasaw National Recreation Area, Murray County, Oklahoma.

PART II. BACKGROUND

Physiography and Geology

Oklahoma is characterized by complex physiography, geology, and ecology. It is crosscut by the Interior Highlands, Interior Plains, and Coastal Plain physiographic regions. The region varies from gently rolling- to- flat plains that conjoin the southern Central Plains with the Gulf Coastal Plains. Uplifts within this vast region reach 400 m (1,300') asl. Throughout much of the region, streams tend to be slow-moving and there are (or were) many wetland areas (Bailey 1995:48).

South-central Oklahoma lies at the juncture of ten geographical regions including the Ozark Plateau (east), the Arkansas River Valley (east-central), Oachita Mountains (southeast), the Wichita Mountains (southwest), Osage Plains (central), and the Enid Plains (north-central)(Figure 3).

Geologically, south-central Oklahoma is very complex and has undergone several major periods of uplift and sedimentation (see Allen 2000; Ham 1950, 1969; Scheirer and Scheirer 2006; Taff 1904). The basement rock is comprised of Precambrian Tishomingo granite that formed approximately 1.4 billion years ago. The Upper Cambrian Reagan Sandstone and Honey Creek Limestone overlie the basal granites and rhyolites. Above these sedimentary formations, we find the Arbuckle group comprised of shales and sands that vary in thickness from 1189 m to 2743 m (3,900' to 9,000') (Allen 2000). The Upper Ordovician, Silurian, and Devonian Periods (510-353 million years ago) are represented by nearly 1219 m (4,000') of Viola limestone, Sylvan shale, and Hunton carbonates (Allen 2000). These deposits, in turn, are capped by Mississippian, Pennsylvannian, and Permian shales, sands, and lime. It is estimated that geologic deposits in the region had attained a thickness of greater than about 5486 m (18,000') (Allen 2000). By 290 million years ago, this geologic "layer cake" was more than six miles thick.

During this period of more than one billion years, the region was flooded by "inland" oceans and underwent dramatic uplifts during the Acadian, Wichita, and Arbuckle orogenies (periods of mountain building) (Figure 4). These massive sedimentary deposits also underwent extensive episodes of folding, faulting, and downgrading. These geologic processes ultimately proved to be very relevant to prehistoric peoples who utilized this region of south-central Oklahoma. The underlying geology has provided surface or near surface exposures of chert (Hunton cherts in the Cravatt member of the Chimney Hill formation and Cochrane chert in the Lawrence uplift), silicified dolomite, Frisco cherts including novaculite, and other lithic raw materials for making stone tools (see Banks 1984:84-86).

The soils within the Arbuckle Mountains are loams and clays that tend to be quite thin and result from the extensive weathering of limestone, conglomerates, and shales (Hoagland and Johnson 2001:385). These soils are not very productive, and, as a consequence, the Arbuckle Mountains became a cattle ranching region after World War I (Morris 1947:190-191). Morris (1947:193) states, "Grasses growing on limestone soils have high content of essential minerals such as calcium and phosphorus."

Environment

The region encompassed by Oklahoma is ecologically diverse. Ten ecoregions (i.e., the Great Plains-Palouse Dry Steppe, the Southwest Plateau and Plains Dry Steppe and Shrub, the Great Plains Steppe, Prairie Parkland (Temperate), the Ozark Broadleaf Forest-Meadow, Eastern Broadleaf Forest (Continental), Southeastern Mixed Forest, Oachita Mixed Forest-Meadow, Prairie Parkland (Subtropical), and Great Plains Steppe and Shrub Provinces are found within Oklahoma (Bailey 1995). The Chickasaw National Recreation Area lies within the Prairie Parkland (Subtropical) Province along the northeastern edge of the Arbuckle Mountains. It also lies within the Central Forest-Grassland Transition that consists of savanna, prairie, and woodlands. Vegetation in this region consists of short as well as medium-to-tall grasses (e.g., bluestem) and post oak and blackjack oak tend to

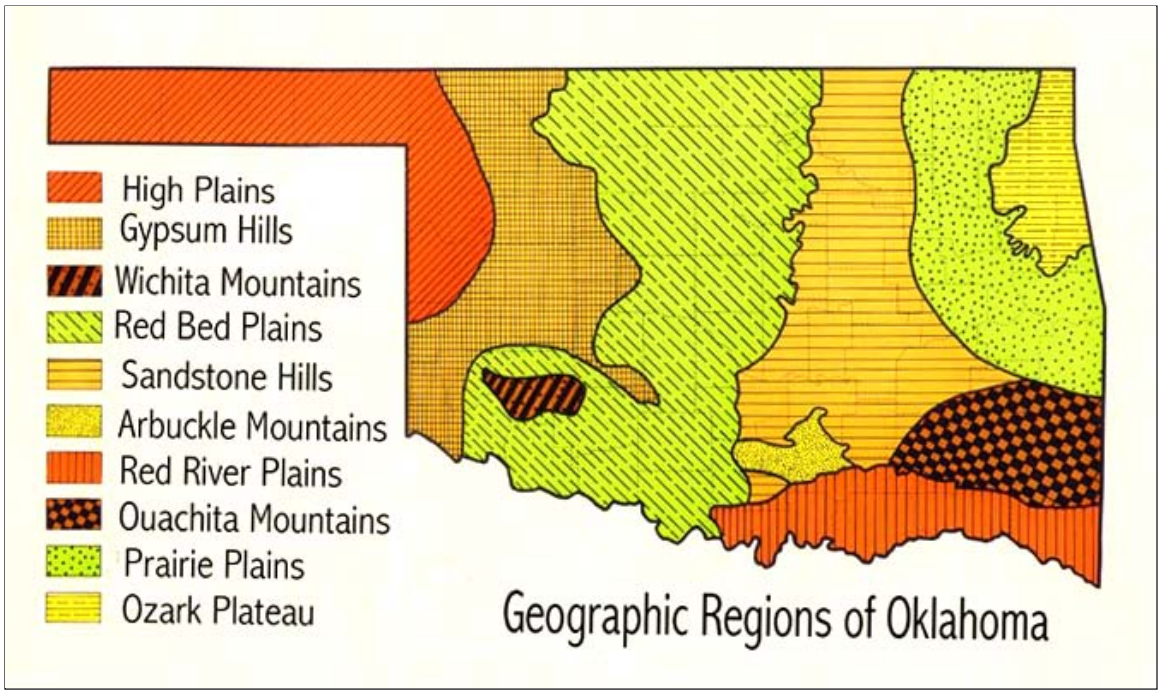

Figure 3. Geographic regions of Oklahoma (from www.geoprospectsexplorations.com/oklahoma.html).

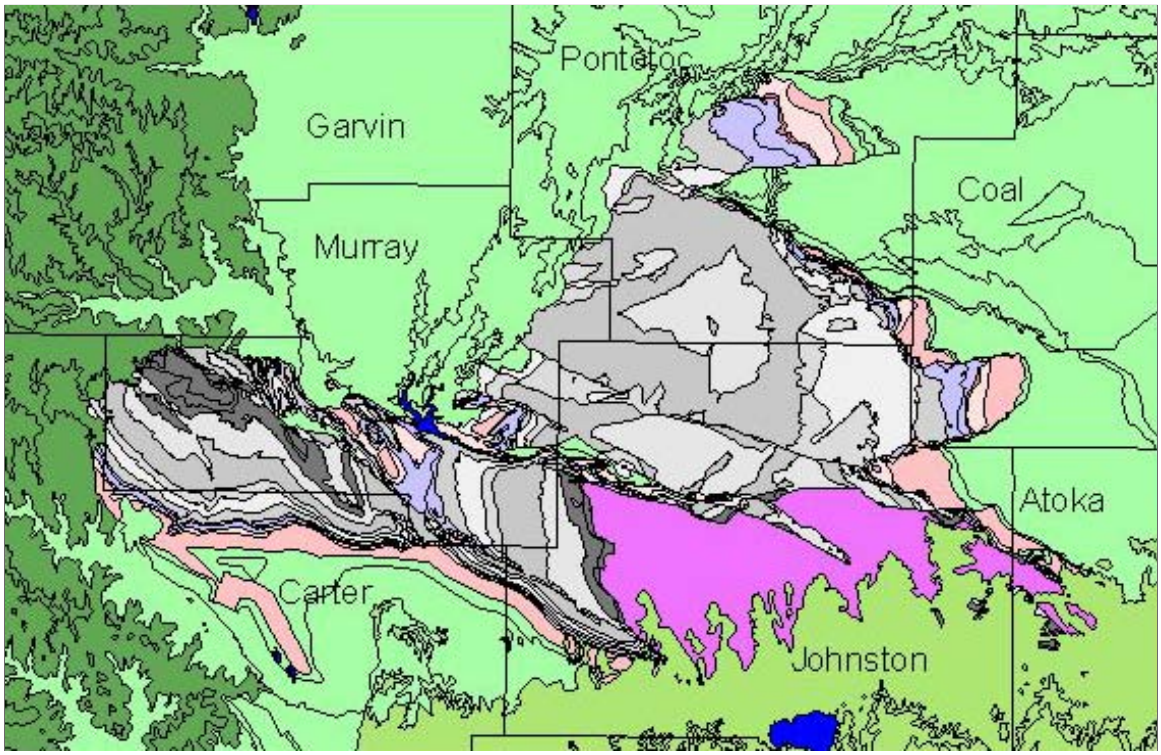

Figure 4. Geological Structure of Murray County, Oklahoma and the Arbuckle Mountains (http://ok.water.usgs.gov/arbsimp/).

dominate this area. Hickories become more prevalent along margins of the savanna near more dense stands of deciduous trees (Bailey 1995:48).

This zone is composed of Prairie, savannah, and woodlands and includes the transition from the tall grass prairies in the east to the mixed grass prairies and short grass plains to the west. Prior to late EuroAmerican expansion and later urban development, this ecoregion was maintained in early stages of ecological succession by fires, periodic drought, and grazing. This ecoregion has undergone significant change due to urban sprawl, intensification of agriculture, and fire suppression. One of the largest blocks of intact Central Forest/Grassland Transition can be found today in the Cross Timbers region of northern Texas and south eastern Oklahoma, as well as the Arbuckle Uplift native grassland. This area of the southern Great Plains is characterized by an oak savanna and a tallgrass prairie understory (Encyclopedia of Earth 2008).

The underlying geology of the Arbuckle Mountains has created an "island" within the surrounding prairie-plains environment. The "mountains" rise above the surrounding plains. There are a number of springs within the region that provide drinking water as well as a range of mineral-rich water. In addition, both distinct plant and animal communities have developed within the Arbuckle Mountains that differ from the surrounding plains.

Hoagland and Johnson (2001:383) state, for example, "The Arbuckle Mountains of south-central Oklahoma have long been of interest to botanists in the region. Rugged topography, limestone and conglomerate geologic substrates, and numerous springs combine to form a suite of habitats that are unique for central Oklahoma." They (2001:383) continue, "The earliest botanical surveys of the region were conducted by Palmer (1934) and Hopkins (1941), both of whom noted floristic affinities with the Edward's Plateau of Texas." Dissected landscapes and increased tree cover provide wood that was utilized as a raw material for making implements and facilities as well as a source of fuel.

The prairie was home to herds of bison that depended upon fires to generate more productive forage. Whitetailed deer are abundant within the transition zones between the savanna and the forested areas. Deer become more numerous in the ecotones of the uplifts such as the Arbuckle Mountains. Elk were also found in this region prior to major historic disruptions including the introduction of cattle. The red wolf is, or has been, an important predator in the region as well as coyotes (Bailey 1995:49). A recent study of fauna inventoried birds, reptiles, and mammals within Chickasaw NRA (Bahm et al. 2007).

Climate

The climate of this province is characterized by warm winters (10°-16°C [50° – 60°F]) and hot summers (21° – 27°C [70°– 80°F]) (Bailey 1995:48). Precipitation, mainly as rain, falls throughout the annual cycle and ranges from 890 mm (35in) in the south to 1,410 mm (55in) in the north. Summary data for the climate of Murray County, Oklahoma is provided in Table 1.

Table 1. Climate Summary for Murray County, Oklahoma (1971-2000) (Oklahoma Climatological Survey 2008).

Temperature		**Precipitation**		**Winter Weather**	
Average annual (°F):	63	Average annual (in):	39.65	Average Annual Snowfall (in):	4.5
Average maximum (°F):	74	Precipitation days:	73	Days With Snow On Ground:	2
Average minimum (°F):	51	Wettest year (1990):	65.56 in	Greatest Seasonal Snowfall (1942)	13.5 in
Highest (°F):	114	Driest year (1963):	19.56 in	Last Freeze Day	March 29
Lowest (°F):	-15	Greatest Daily Rainfall (1970)	11.61 in	First Freeze day	Nov. 5
Days > 90°F:	83			Growing Season (days)	221
Days < 20°F:	13				

Archeology

An archeological survey of the proposed Lake of the Arbuckles (Arbuckles Reservoir) was carried out by Sherman P. Lawton in 1957. Final survey work was completed by the Oklahoma River Basin Survey Project (Barr 1965). As a result of this survey, extensive archeological excavations were conducted at the Pruitt Site (34MR12). This site was located within the barrow area for the earthen dam that was to be constructed within a narrow stretch of the valley below the confluence of Buckhorn, Guy Sandy, and Rock Creeks in Murray County. The site covered approximately 30 acres along an extensive alluvial terrace system that bordered Rock Creek. The Pruitt Site had been known about by local artifact collectors but had not been recorded by archaeologists until this time.

Field work began on March 31, 1965 and continued until May 22, 1965 (Barr 1965: 1). Earth-moving equipment was used extensively at the Pruitt Site to expose four large "blocks." These "blocks" (A, B, C, and D) covered 2,090.32 m^2 (22,500 ft^2), 3,414 m^2 (36,750 ft^2), 2926.45 m^2 (31,500 ft^2), and 1170.58 m^2 (12,600 ft^2), respectively (Barr 1965: 10-15). The total area within the terrace that was exposed equaled 9,601.35 m^2 (103,350 ft^2). These blocks were then shovel skimmed and 29 features were defined and excavated. These features included post molds as well as five different types of pit features including ovoid, cylindrical, bell-shaped, truncated paraboloid, and irregular pits (Barr 1965: 16-39). These features contained an array of chipped and ground stone artifacts as well as potsherds, bone tools, animal remains, and some domesticated plant material (specifically 10-row maize).

The chipped stone implements included both dart (atlatl) points and arrowpoints as well as bifacial knives, drills, and choppers. Unifacial scrapers and cores were also recovered. Ground stone implements included hammerstones, "mullers" or manos, cupstones, a milling basin, awl abrader, and a celt (Barr 1965:59-64). Bone implements included awls and beamers and freshwater mollusk shell valves that had been fashioned into scrapers. A drilled and ground stone elbow pipe was also found during excavations. More than 300 potsherds (predominately cord-marked) and one restorable ceramic vessel were recovered from the Pruitt Site. Animal remains from these excavations include whitetailed deer, raccoon, beaver, rabbit (cottontail, swamp, and jackrabbit), squirrel, cotton rat, turkey, fish (catfish, drum, shad, and sucker), turtle, and freshwater mollusks. Two charcoal samples were submitted for radiometric dating. The oldest date of A.D. 810 $\pm$ 90 (GaK-900) was assigned to the Plains Woodland period . The second date of A.D. 1290 $\pm$ 90 (GaK-899) coincides with the Washita Phase that has recently been assigned to the Redbed Plains Variant in central and west-central Oklahoma (Drass 1998:427). Drass (1998:430) states, " The Pruitt complex was initially defined for Plains woodland sites in central Oklahoma (Barr 1966), but the major sites for this complex are now attributed to the Plains Village period (Drass 1988)." More importantly, however, is the fact that Plains groups in this area had reduced their mobility, adopted maize horticulture (as well as reliance upon marsh elder, little barley, may grass, and knotweed), invested in more permanent housing and food storage facilities, and shifted to the exploitation of more diverse forest edge game animals and aquatic resources.

Recently, archaeological surveys have been conducted in the NRA by Effigy Archaeological Services, Shawnee Mission, Kansas. Additional survey was completed during 2002 and 2003 by 4G Consulting, St. Paul, Minnesota. They completed a pedestrian survey of 1,880 acres within the NRA prior to the implementation of a fuel reduction program. In addition, the Great Lakes Archaeological Research Center, Inc. (GLARC) conducted an archaeological inventory survey of 48.9 ha (120.22 a) within the eastern portion of the Platt Historic District of the NRA in the spring of 2008 (Gregory and Taliaferro 2008). This survey was completed prior to a prescribed burn designed to clear accumulated vegetation. No previously unrecorded archaeological sites were observed within this area (Gregory and Taliaferro 2008). A number of small scale archaeological surveys have also been conducted by Bussey (1990a, 1990b, and 1994) and Fox (1996a, 1996b, 1996c, 1996d, 1997, 2000a, 2000b, 2000c, 2000d, 2000e).

Field Survey and Monitoring Activities

MWAC archeologists consisting of two individuals carried out a number of small scale surveys of a number of locations within the Chickasaw National Recreation Area. The objective of these pedestrian surveys was to locate prehistoric and/or historic cultural resources that may be impacted by proposed renovation and ground disturbing projects within the park. A description of these projects and the results of the surveys and monitoring activities follow.

CHICKASAW NATIONAL RECREATION AREA

Gravel Road Rehabilitation Project

Lake District This project entails the rehabilitation of "back country" roads within the NRA that includes re-surfacing with crushed rock and the placement of 22 - 18' metal culvert pipes. These culverts will improve drainage and reduce erosion of the road bed. These gravel roads are located within The Point and Buckhorn Areas of the NRA (Sections 17 and 20, Township 1 South, Range 3 East; Dougherty Quadrangle Oklahoma 7.5 Minutes Series). Each culvert location in these two areas was assigned a letter designation ("A" – "N" in the Buckhorn District and "O" – "V" in the Point area (Figure 5).

The archeologists inspected an area approximately 10 m in radius around the ends of each existing culvert or proposed culvert location. Photographs were taken of representative culvert locations on each road segment (Figure 6). In many cases, vegetation including trees, dense undergrowth and ground cover was encountered. An inspection of road ditches and cut banks around these locations was conducted including survey in associated clearings and terrace edges. A number of the proposed culverts were situated on hillslopes or in the courses of small ephemeral drainages. No archeological remains were observed in any of these 22 locations.

Platt District This portion of the gravel road rehabilitation project will involve existing roads within the Black Sulphur Springs Picnic Area, the Picnic Area South of Black Sulphur Springs Pavilion, and the Trail Head Area South of Lincoln Bridge. This project is designed to improve road surfaces and to demarcate roadways and parking areas more clearly. Existing road "loops" within the Picnic Area South of the Black Sulphur Springs Pavilion will be revegetated. The loop road around the Black Sulphur Springs Picnic Area will be resurfaced and demarcated with temporary rock barriers. Selected road segments will be blocked with barrier rocks and revegetated (Figure 7).

The archeologists completed a pedestrian reconnaissance within the boundaries of these picnic areas and the Trail Head Area at Black Sulphur Springs. All areas were inspected that will be subject to road rehabilitation. Exposed areas, particularly those along the perimeter and close to the wooded areas south of Rock Creek were thoroughly examined. No archeological remains were observed within these areas.

Rehabilitation of the Buffalo Springs Comfort Station

This project entails the rehabilitation of the Buffalo Springs Comfort Station that was closed in 1973. A key component of this project includes the installation of a septic tank. It will be located near an existing manhole (No. 79; 3819929N/688998E). This manhole is connected to the existing 3,000 ft of 6-8" diameter clay tile sewer line (Figure 8).

Five auger holes were excavated east of Manhole No. 79 using a Caterpillar Bobcat 226B with a front-mounted auger (40 cm diameter)(Figure 9). Three holes were augered to a depth of 1.3 m and the fourth and fifth holes struck rock. All earth fill from these

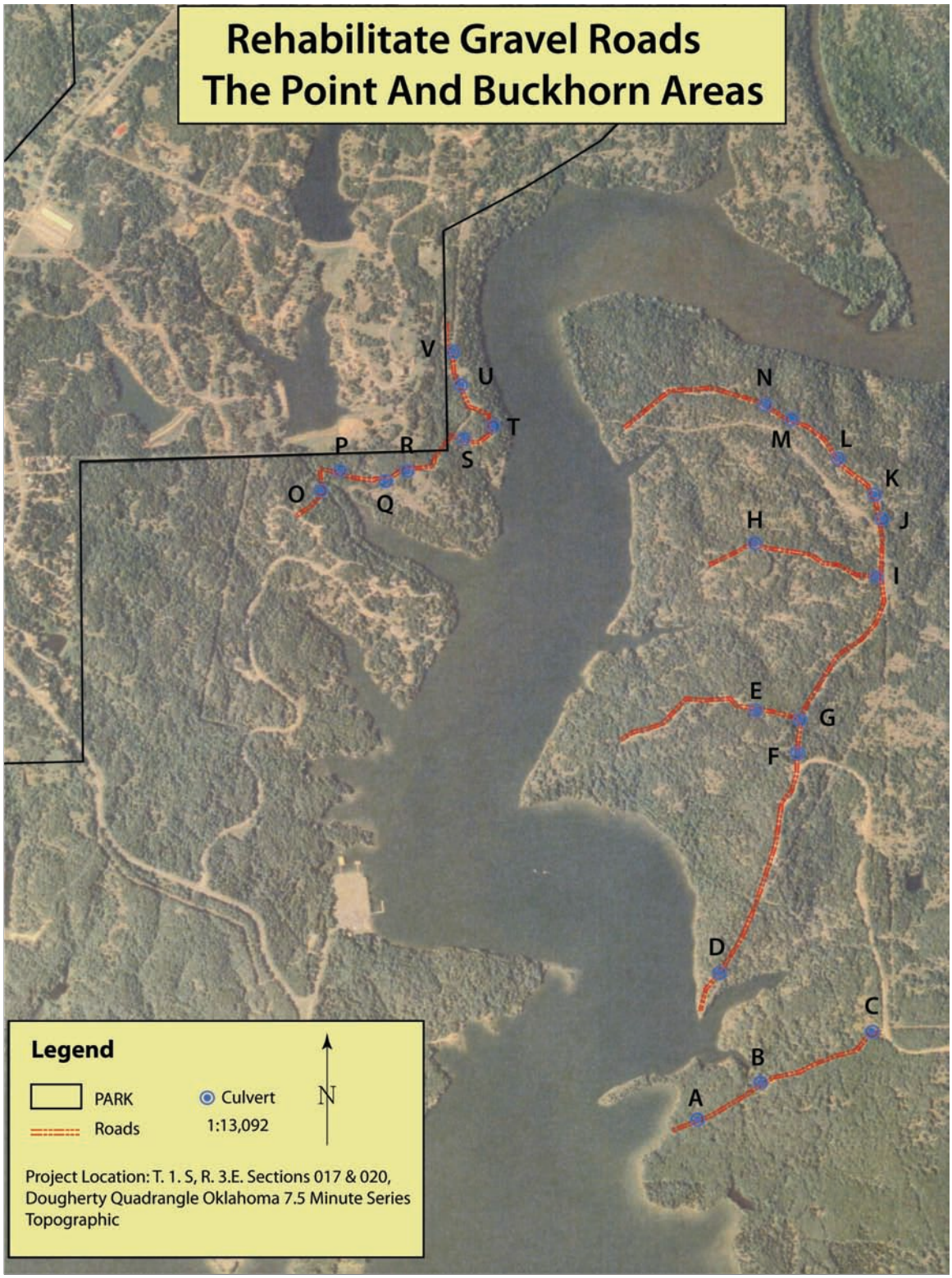

Figure 5. Map showing culvert locations for The Point and Buckhorn Gravel roads.

Figure 6. Example of gravel road rehabilitation associated with Culvert "M" looking south.

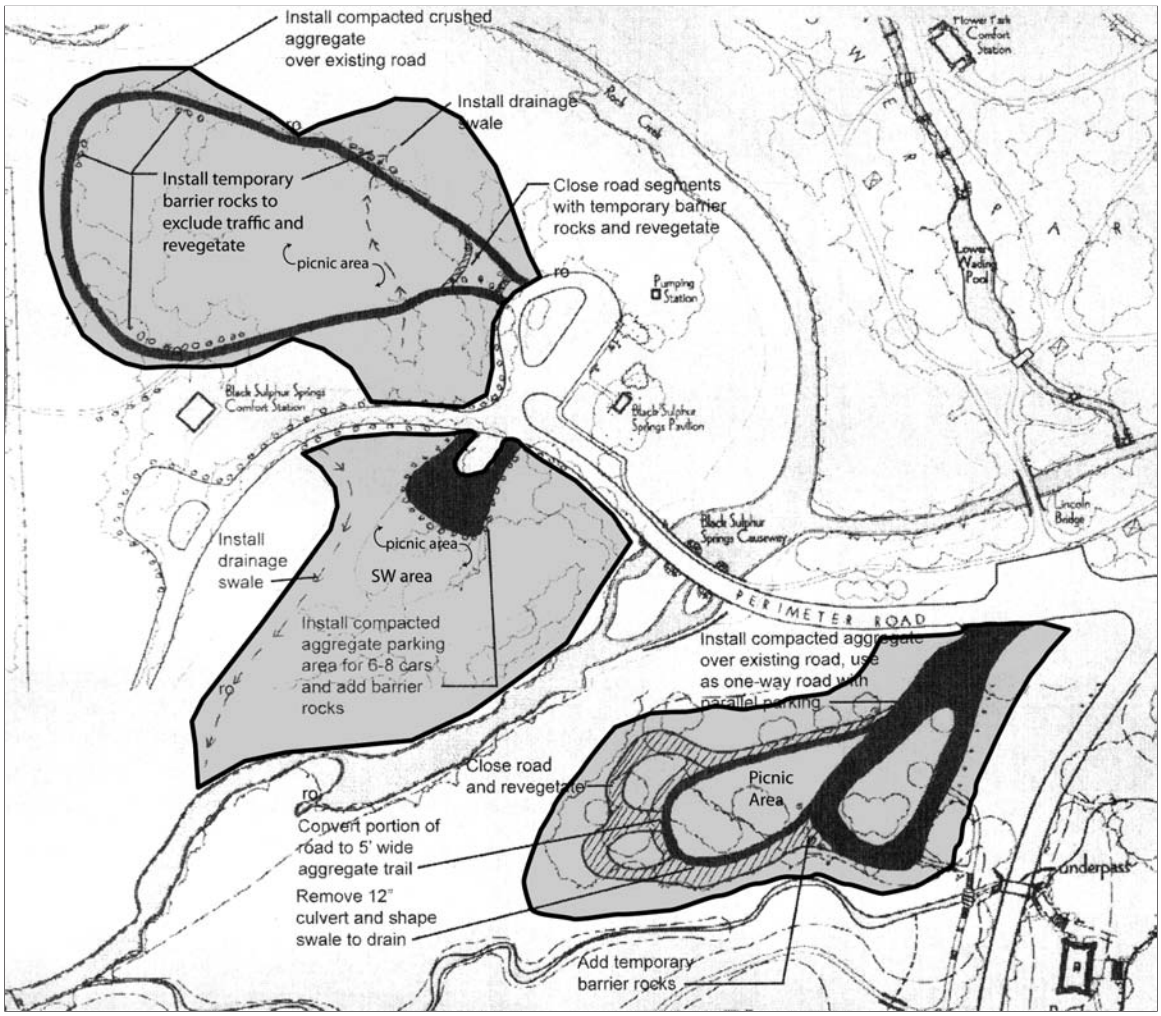

Figure 7. Map showing elements of the Platt District Road rehabilitation plan.

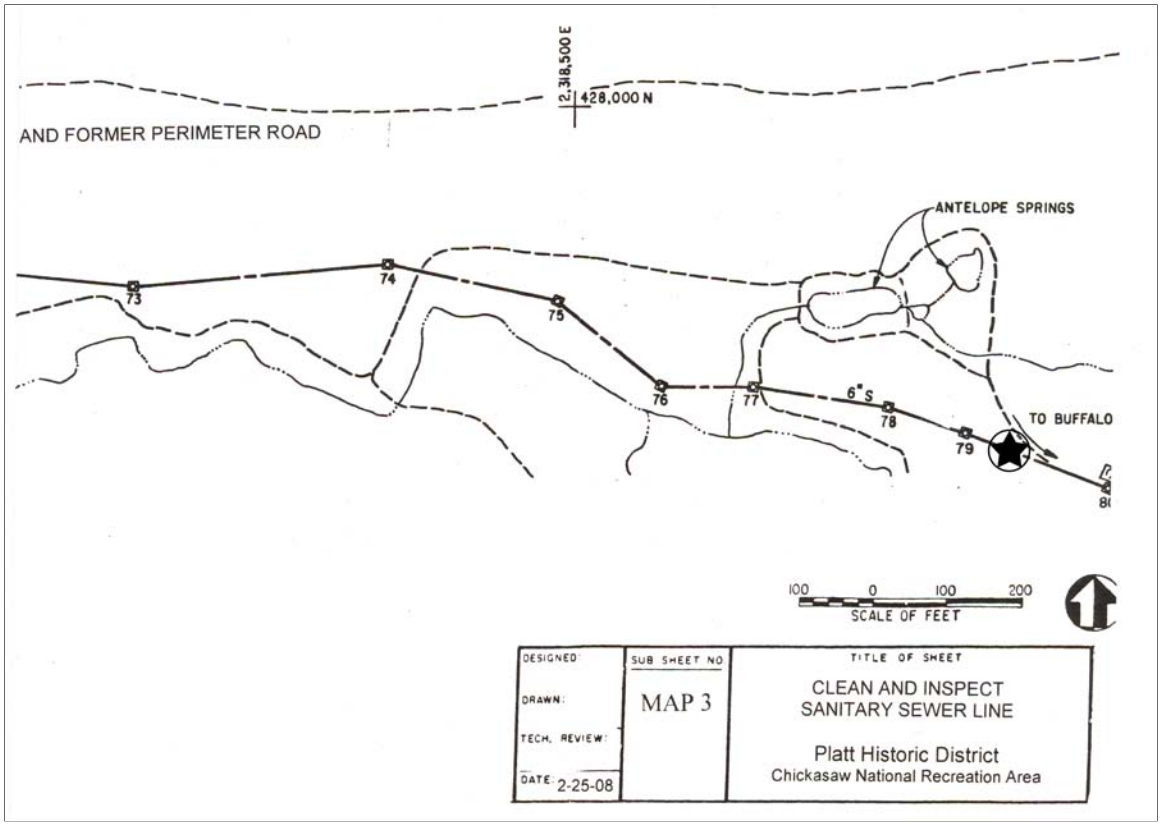

Figure 8 . Location of septic tank for Buffalo Springs comfort station.

Figure 9 . Conducting auger tests near Buffalo Springs Comfort Station.

tests was troweled and examined for archeological remains. No archeological material was observed in this earth fill; however, one white chert decortation flake was found on the surface. It was located 3.9 m from the center of Manhole No. 79 at a bearing of N245°E. This area lies within the relatively flat floodplain of Travertine Creek that is fed, in part, by Buffalo Springs. No additional archeological materials were observed in this area.

Replacement of Portable Vault Toilets

Vault toilets will be installed at thirteen locations at both Veterans Lake and Lake of the Arbuckles. Single vault toilets will be installed at the Eagle Bay Boat Launch at Lake of the Arbuckle and at both the East Trail Head and the Spillway at Veterans Lake. Double vault units will be emplaced at the picnic Area and Picnic Pavilion at Veterans Lake and at the Buckhorn Loops E and F, The Point, Blackjack Road Point Area, Upper Loop Point Campground, Guy Sandy Boat Launch, and at Guy Sandy Campground, West and East (Figure 10). For the most part, these units will be installed at or near existing toilet facilities.

A series of auger holes were bored at each of these locations in order to test subsurface deposits. With one exception (Veterans Lake Picnic Area), all of these auger tests were completed using a Caterpillar Bobcat 226B with front-mounted auger (Figure 11). The number of auger tests at these locations varied from two to six holes. The monitoring crew consisted of at least two archeologists and on many occasions included Ken Ruhnke, Landscape Architect. During the excavation of each auger test, the machine operator was able to lift the loose earth from the auger hole and deposit it nearby for inspection. All loose fill was then carefully examined and trowelled in order to locate any archeological materials. Brief notes were taken about each test regarding location, depth, soil description, and contents. Photographs were taken at each test location. Data regarding each of these tests is provided in Appendix I.

Archeological material was observed and recovered (34MR164) from one auger test at Buckhorn Loop E on the Lake of the Arbuckles. It was found within the loose fill that had been removed from the auger test in the northwest corner of the proposed vault toilet facility. The initial artifact consisted of a small “core” fragment of black chert with cortex. There are four negative flake scars that form four facets on this small 2 cm long fragment (Figure 12). This fragment was found during trowelling through the loose fill dirt. As a result, we dry screened all of the fill through ¼” mesh hardware cloth. Five additional fragments of the same black chert material were recovered including one small flake and three angular “core” fragments. In addition, a gray-tan chert tested cobble/core, two small core fragments, six decortation flakes/flake fragments, nineteen small flakes/flake fragments, and one modified flake were also recovered during screening. These artifacts were all derived from the same chert cobble that exhibits a distinct white-tan cortex. None of these pieces could be refitted. Two pieces of chert shatter were also found. One flake exhibits a graver spur at one end and minute retouch or utilization along a small section of the opposite end (Figures 13a and 13b).

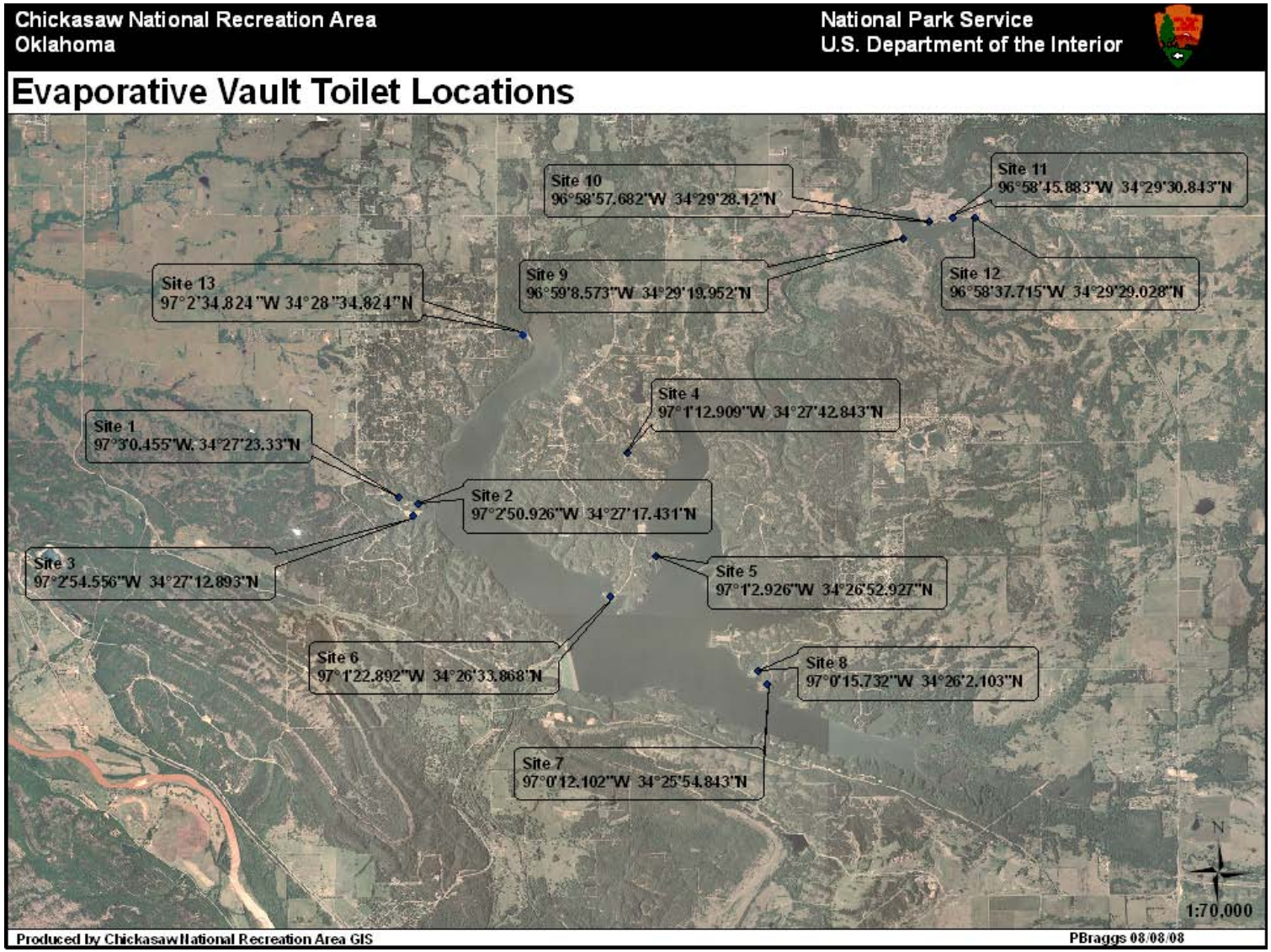

Figure 10. Map showing the general locations for auger testing associated with proposed evaporative toilet facilities.

Figure 11. Caterpillar Bobcat 226B with front-mounted auger drilling a test at Guy Sandy Campground West.

Figure 12. Chert core and decortation flakes from Buckhorn Loop E auger test.

Figure 13a. Dorsal surface of chert flake with graver tip (top).

Figure 13b. Ventral surface of chert flake with graver tip (top).

The lithic artifacts from the Buckhorn Loop E contained fractured tabular pieces of gray brown chert with a thin white cortex. A number of cortical flakes as well as interior flakes had been removed from these relatively small fragments and, as a result, had created a core. During this reduction process, a number of small core fragments had also been produced. In fact, one of the largest flakes had been retouched and used as a tool. This chert is very high quality and does not exhibit micro-fractures, crystal inclusions, or other impurities.

The lithic artifacts found at this location suggest that it was not a solitary example of "cobble testing." We did observe a number of chert cobbles and several pieces of silicified dolomite. We can expect that prehistoric peoples would have tested these by fracturing them to determine their suitability for knapping. Archeologists have, in fact, observed a number of these sites (e.g. 34MR0045, 34MR0095, 34MR0096, and 34MR0136) where cobbles were tested or raw material was procured within the Chickasaw National Recreation Area.

In order to ascertain the nature of subsurface deposits near this productive auger test, six additional auger tests were conducted. These auger tests were positioned further east and south of the original northwest auger test. All loose fill from three auger tests was carefully examined by trowelling and all of the earth from three of these tests was dry screened through ¼" mesh hardware cloth. No archeological material was observed.

Installation of Electrical Conduit at Antelope Spring

This project includes the installation of an electrical conduit that will connect a flow meter in Antelope Spring to a solar panel and data transmitter. The conduit will run from the spring to either a nearby hilltop or an access road (Figure 14). Vegetation is quite thick along the margins of the spring away from the path. The proposed course for this conduit alignment was examined as it ascended the steep hillslope east and north of the spring. Ken Ruhnke pointed out the base of a historic interpretive sign just east of Antelope Spring along the base of the hillslope (Figure 15). Two 12" diameter wooden posts had been set in a rock (conglomerate) and concrete footing. The centers of the wooden posts were 2.1 m (7') apart and the entire footing was approximately 3.66 m (12') long. A sandstone stairway was also observed north of the spring. It descends from a recently cleared access road into the low lying area east of Antelope Spring.

A light scatter of historic material was noted above the spring including several brown glazed pottery or crockery fragments, several bottle glass shards (clear glass), a small shard of amber-colored bottle glass, several fragments of stoneware, a piece of cast iron, and a clinker fragment. Small clearings exist in dense stands of cedar in this locality. The ground surface was exposed to sheet wash in this area above the spring and bed rock could be seen exposed in several areas. This project will involve minimal ground disturbance. The soil is quite shallow particularly in the areas on the hillslope above the spring.

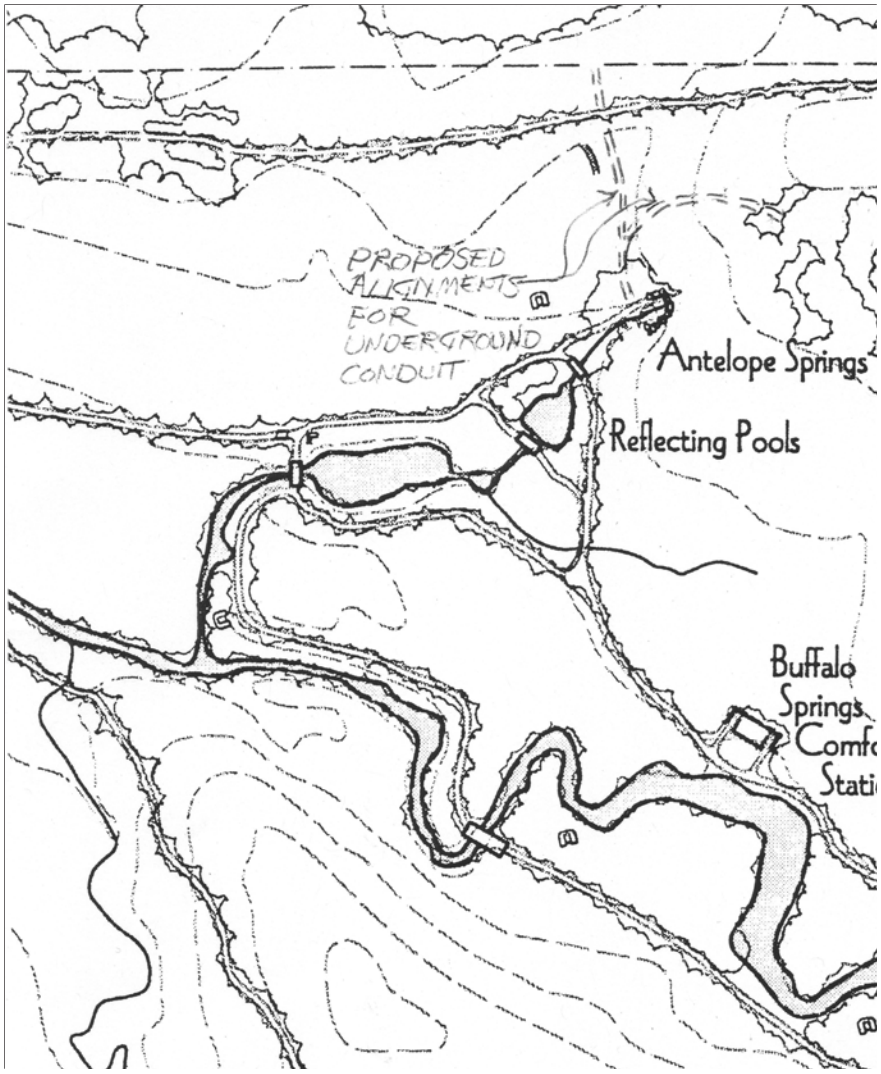

Figure 14. Map showing proposed, alternative routes for underground conduit connected to U.S.G.S. Gauging Station at Antelope Springs.

Figure 15. Conglomerate and concrete footing and wood post remnants (flagged) of historic sign at Antelope Spring.

Rehabilitation of the Pavilion Springs Area

This project involves a number of modifications to the landscape in order to reduce erosion and minor flooding of Pavilion Springs. This work includes berm repairs along the southeastern and northwestern edges of the parking lot, cleaning swales along the western side of the Pavilion and northeast of the Pavilion, and adding fill to eroded areas south of the Pavilion (see Figure 16).

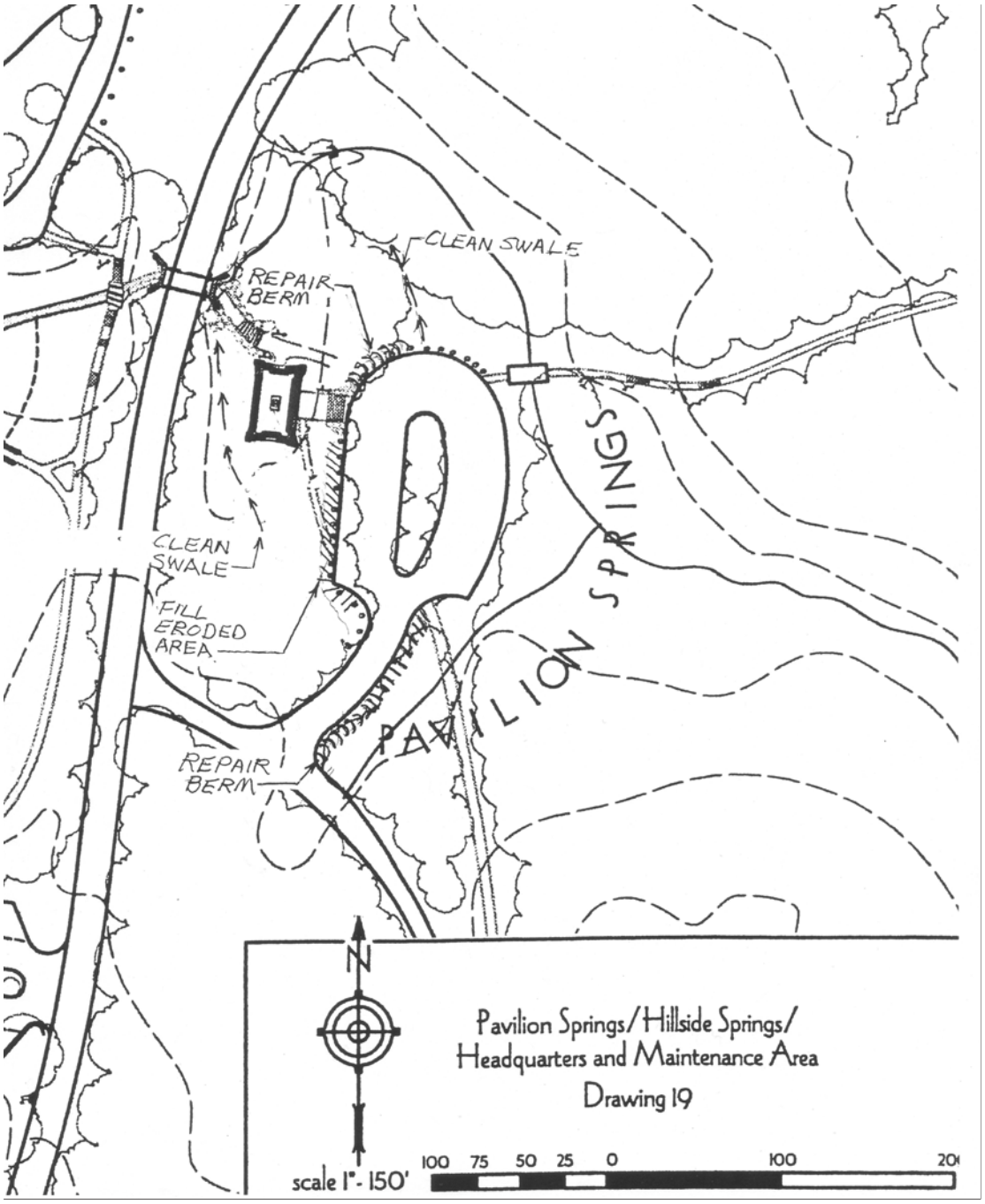

Figure 16. Map of Pavilion Springs showing proposed rehabilitation activities.

Archeologists examined the berms and the associated drainage ditches. Historic brick and clay tile fragments, bottle glass shards, and some modern plastic water bottles were observed in these areas. We also inspected the lawn and sloping areas south of the Pavilion. Several small shards of brown glass, dark blue glass, and a rusted metal tag were observed. This historic materials is no doubt related to the historic town of Sulphur that was located in this area. A subsurface drain pipe and a corner angle will be replaced several meters north of the northwest corner of the Pavilion. Excavation of a trench to complete this work will potentially encounter historic artifactual material (Hohmann and Grala 2004: 47-48; 103-104).

Rehabilitation of Portions of Rock Creek Multi-use Trail No. 1

This project involves the rehabilitation of portions of Trail No. 1 (Figure 17). Alluvial erosion has occurred near the trail head at the south end of Trail No. 1 as it ascends the

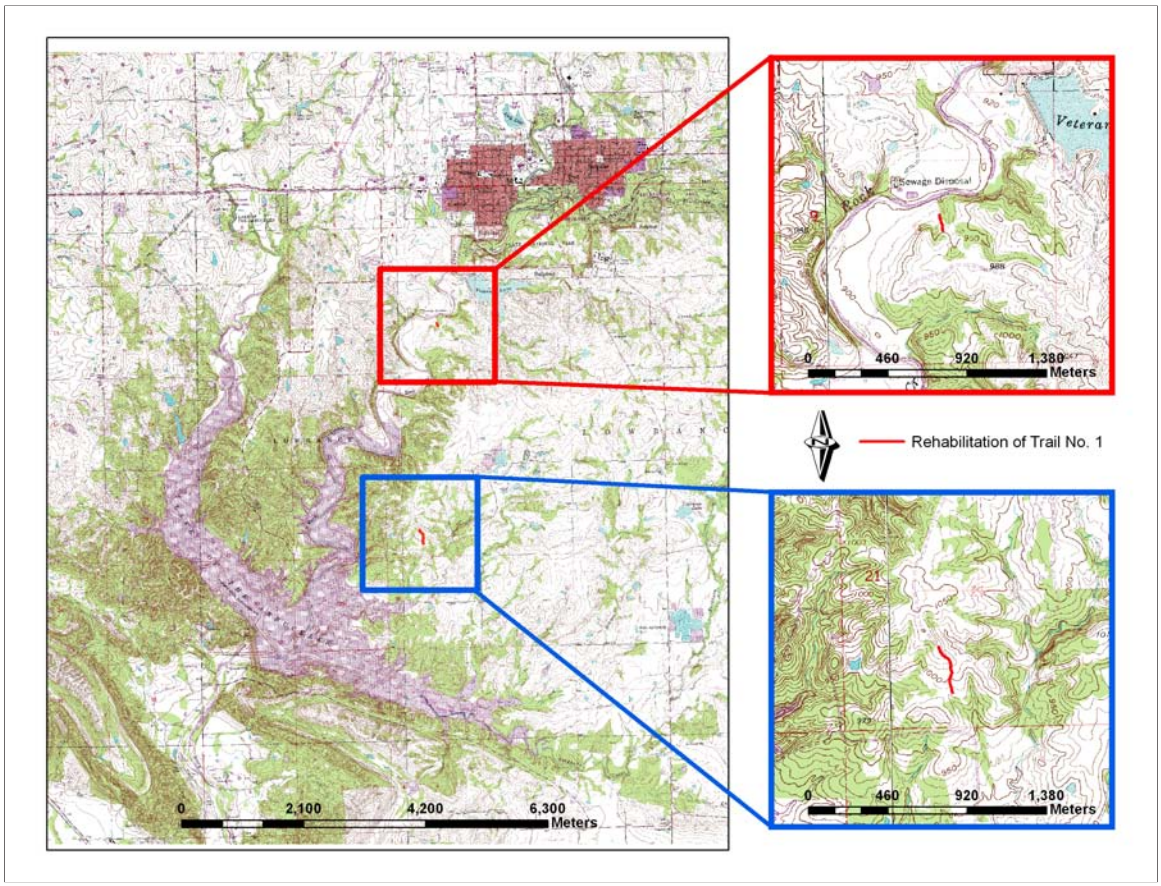

Figure 17. Map of Trail No. 1 showing the locations of heavy erosion.

hillslope north of the gravel road. There are at least three sections along this portion of Trail No. 1 that have undergone alluvial erosion. Portions of this trail may be repositioned on the hillslope. Consequently, examination was made of not only the exposed surfaces along the trail but the relatively open areas within a 30-40 m corridor centered upon the trail. This area was covered with grasses, cedars, clusters of young sumac, and large standing,

dead trees. Some residual chert was exposed within the trail, however, no archeological material was observed. Examination of a portion of Trail No. 1 that ascended a hillslope approximately one mile south of the north trail head downstream from Veterans Lake was also conducted (Figure 18). This area was also heavily vegetated and was covered with grasses, sumac, cedars, and standing, dead trees. Cobbles derived from conglomerate were observed within the eroded areas of the trail as well as in exposed areas along the trail's edge. Survey was conducted along both sides of the trail but the surface visibility in this area was approximately five percent due to thick grasses and vegetation. No chert was seen in this area and no archeological materials were observed.

Figure 18. Erosion on Trail No. 1 east of Rock Creek and southwest of Veterans Lake (view toward the northwest).

Summary and Recommendations

Archeologists from the Midwest Archeological Center conducted a series of small scale pedestrian surveys and monitoring activities within the Chickasaw National Recreation Area during a one week period in late June 2008. The surveys and monitoring of auger tests were carried out throughout the NRA in association with a number of proposed projects. These rehabilitation and renovation projects included: 1) installation and/or replacement of twenty-two 18' steel culverts along back country roads; 2) the installation of single and double vault toilets at thirteen locations; 3) rehabilitation of the comfort station near Buffalo Springs; 4) installation of an electrical conduit and solar panel at Antelope Springs; 5) upgrade of roads and modification of picnic areas within the Platt Historic District; 6) rehabilitation of berms and drainage features at Pavilion Springs; and, 7) renovation of eroded areas of Rock Creek Multi-use hiking Trail No. 1.

- The survey team examined 22 culvert locations along gravel roads associated with The Point and the Buckhorn areas of the NRA. No archeological materials were observed at any of these locations.

- Fifty-four separate auger test were monitored during excavation at thirteen current or proposed vault toilet locations. All of the earth fill from these tests was carefully examined (hand troweled) and the fill from five of these tests was dry screened through ¼" mesh hardware cloth. Prehistoric archeological material was recovered from one of these tests at Buckhorn Loop E. Six additional auger tests were excavated at the Buckhorn E location but no archeological material

was observed. Recommendation: An archeologist should be present during the excavation of the vault chamber at Buckhorn Loop E (34MR164).

- Five auger tests were completed along the present sewer line near Buffalo Springs comfort station. Although no archeological materials were observed or recovered during these subsurface tests, one gray/white chert flake was found on the surface near Manhole No. 79. No additional archeological material was observed in this area.

- Possible routes for an electrical conduit at Antelope Springs was surveyed. This conduit will connect a stream flow gauge to a solar panel either east or southeast of the spring. Several historic artifacts were observed on bed rock and thin soils above the spring. The concrete base and wooden post remnants of an historic sign as well as sandstone staircase were observed east of the spring.

- Picnic and parking areas associated with Black Sulphur Spring in the Platt Historic District are meant to undergo modifications to redirect traffic and use of the area. Some areas will be blocked off and re-vegetated and existing main roads will be resurfaced with crushed rock. These areas were surveyed and no archeological materials were observed.

- Berms, swales, and landscaped surfaces within the Pavilion Springs area were surveyed prior to proposed rehabilitation designed to reduce water erosion. A buried drain pipe is also to be cleaned and/or replaced. Recommendation: An historic archeologist should be present during the excavation of the buried water pipe.

- Portions of Rock Creek Multi-use Trail No. 1 will be rehabilitated due to alluvial erosion. Two sections of Trail No. 1 as well as the trail corridor were surveyed. No archeological materials were observed.

Unless mentioned, none of these ground disturbing, renovation, or rehabilitation projects within the Chickasaw National Recreation Area will adversely affect cultural resources.

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APPENDIX I.

Appendix I. Data Pertaining to the Auger Tests at Vault Toilet Facilities within Chickasaw National Recreation Area, Murray County, Oklahoma (Note- Location number refers to the map of auger tests in Figure 10.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Veterans Lake	East Trail Head: #12	North			0.20	Loose rock	None	Shovel test revealed very shallow soil overlying bedrock; Loose soil troweled and examined for artifacts.
Veterans Lake		South			0.20	Loose rock	None	Shovel test revealed very shallow soil overlying bedrock; Loose soil troweled and examined for artifacts.
Veterans Lake	Picnic Area: #11	North (nearest road)	3818503	685529	1.1-1.2	Loose, dry dark reddish brown loam with residual cobbles from conglomerate	None	Loose soil troweled and examined for artifacts.
Veterans Lake		South (nearest Lake)			1.1-1.2	Loose, dry dark reddish brown loam with residual cobbles from conglomerate	None	Loose soil troweled and examined for artifacts.
Veterans Lake	Picnic Pavillion: #10	SW	3818421 (Center)	685238 (Center)	0.46	Limestone bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		NW			0.86	Limestone bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		SE			0.70	Limestone bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		NE			0.71	Limestone bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Veterans Lake	Spillway: #9	SW	3818182 (Center)	684944 (Center)	0.82	Loose reddish brown soil; bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		NW			0.46	Loose reddish brown soil; bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		SE			0.51	Loose reddish brown soil; bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Veterans Lake		NE			0.42	Loose reddish brown soil; bedrock encountered at bottom.	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles	Guy Sandy Boat Launch:#3	Center			0.71	This location is abutted by an asphalt parking lot.	None	Top soil ca. 15 cm deep underlain by compacted soil containing limestone 3-4 cm in diameter. This deposit is fill.
Lake of the Arbuckles	Guy Sandy Campground West:#1	SW			1.10	Red clay loam with moderate amount of gravels/rock overlying bedrock.	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NW			1.17	Red clay loam with moderate amount of gravels/rock overlying bedrock.	None	Loose soil troweled and examined for artifacts.

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		SE			1.17	Red clay loam with moderate amount of gravels/rock overlying bedrock.	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NE			0.91	Red clay loam with moderate amount of gravels/rock overlying bedrock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		Center	3814401	679092			None	
Lake of the Arbuckles	Guy Sandy Campground East:#2	SW			1.48	Parking lot fill overlying reddish-brown loam with underlying bedrock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NW			0.65	Parking lot fill overlying brown/tan compact soil with underlying bedrock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		SE			1.41	Brown/tan compact soil with residual gravels	None	Loose soil trowled and examined for artifacts.
Lake of the Arbuckles		NE			1.41	Brown/tan compact soil with residual gravels	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		Center	3814322	679329			None	Reading on red survey “brush” marker: not an auger test.

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles	Blackjack Road Point:#5	SW	3813611	682139	1.31	Loose, light brown soil with 50% gravel/ rock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NW	3813610	682144	1.37	Red clay loam with abundant rock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		SE	3813605	682140	1.39	Red clay loam with some gravel/rock	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NE	3813605	682144	1.42	Red clay loam with dark clay near bottom.	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles	End of Point Area:#6	SW	3813055	681520	1.22	Light tan loose soil with minimal quantity of residual “pea” gravel; red clay near bottom	None	Loose soil troweled and examined for artifacts.
Lake of the Arbuckles		NW	3813056	681521	1.27	Light tan loose soil with minimal quantity of residual “pea” gravel; red clay near bottom	None	Loose soil troweled and examined for artifacts. Several small saw-cut pork rib fragments in fill and a number of others on the surface (modern).
Lake of the Arbuckles		SE	3813052	681623	1.29	Light tan loose soil with minimal quantity of residual “pea” gravel; red clay near bottom	None	Loose soil troweled and examined for artifacts.

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		NE			0.96	Light tan loose soil with minimal quantity of residual “pea” gravel; red clay near bottom	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles	Upper Loop Point Camp-groud:#4	South	3815073	681773	1.30	Upper graveled surface/black construction fabric/ loose light brown soil with abundant gravel/rock and red clay at bottom	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		Middle			1.35	Same as South auger hole stratigraphy; soil loose and powdery.	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		North			0.82	Loose red-brown soil (colluvium) with natural reasidual gravels- mostly limestone with some chert gravel.	None	North auger hole moved closer to undisturbed area of ridgetop away from toilets. Loose soil troweled and examined for artifacts
Lake of the Arbuckles	Eagle Bay: #13	SW	3816736 (Center)	6805261 (Center)	0.63	Brown loam with natural gravels overlying very hard stratum (rock?)	None	Loose soil troweled and examined for artifacts

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		NW			1.35	Dark brown loam; moist with “pea” gravels that grade into red-brown clay.	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		SE			1.35	Medium to darker brown loose loam with some small gravels that grade into red clay.	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NE			1.35	Medium to darker brown loose loam with some small gravels	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NE (Extension)			1.35	Medium to darker brown loose loam with some small gravels	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		SE (Extension)			1.35	Medium to darker brown loose loam with some small gravels	None	Loose soil troweled and examined for artifacts. One possible basalt flake
Lake of the Arbuckles	Buckhorn Road Loop E:#7	SW	3811849	683470	1.3	Loose, light brown loam with natural gravels (residual)	None	A portion of the loose soil troweled and examined for artifacts Later, all fill dry-screened ¼” mesh; had been partially troweled and no artifacts had been found.

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		NW	3811853	683475	1.32	Loose light brown loam with some natural gravels.	Yes	Loose soil troweled and examined for artifacts Small multifaceted nodule of black chert with negative flake scars initially found during troweling. Later, all fill dry-screened ¼" mesh. Later found core fragments, flakes, shatter, and flake tool.
Lake of the Arbuckles		SE	3811850	683474	1.35	Medium red-brown loam with natural gravels.	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NE	3811849	683476	1.3	Medium brown loam with natural residual chert gravels.	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		SW2	3811855	683475	1.3+	Similar to descriptions above	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NW2	3811854	683477	1.3+	Similar to descriptions above	None	Dry screened ¼" mesh
Lake of the Arbuckles		SE2	3811852	683481	1.3+	Similar to descriptions above	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NE2	3811852	683486	1.3+	Similar to descriptions above	None	Loose soil troweled and examined for artifacts

Appendix I. Continued.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		Sidewalk Area West	3811855	683470	1.3+	Similar to descriptions above	None	Dry screened ¼" mesh.
Lake of the Arbuckles		Sidewalk Area East	3811858	683479	1.3+	Similar to descriptions above	None	Dry screened ¼" mesh.
Lake of the Arbuckles	Buckhorn Road Loop F:#8	SW			1.35	Dry, loose, medium-to-light brown loam with natural gravels (residual).	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		NW			1.35	Dry, loose, medium-to-light brown loam with natural gravels (residual).	None	Loose soil troweled and examined for artifacts
Lake of the Arbuckles		SE			1.35	Dry, loose, medium-to-light brown loam with natural gravels (residual).	Yes	Loose soil troweled and examined for artifacts. Artifacts are two fragments of glass bottles- one basal fragment and one "other." Glass believed to be modern- no patina and no discoloration.

Appendix I. Concluded.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Lake of the Arbuckles		NE			1.35	Brown loam with abundant “pea” gravel.	None	Loose soil troweled and examined for artifacts. Several freshly chipped/nicked gravel fragments (associated with the augering). Some larger rock fragments.

APPENDIX II.

Appendix II. Data Pertaining to the Auger tests Associated with the Rehabilitation of the Buffalo Springs Comfort Station, Chickasaw National Recreation Area, Murray County, Oklahoma.

Area	Location	Cardinal Location	Northing	Easting (14)	Depth (m s.d.)	Soil Description	Artifacts	Comments
Platt Area	Buffalo Springs Comfort Station:	SW					None	Soil was troweled but no artifacts were observed.
Platt Area		NW			1.3		Yes	Soil was troweled but no artifacts were observed. A primary decortation fl;ake was found by Ken Ruhnke on the surface between the auger hole and the manhole located to the southwest. The flake was 3.9 m N245°E of the manhole. It was collected. The manhole cover (center) was located at 3819929N/14 688998E (1060' asl).
Platt Area		SE	3819929	688990	1.35	Dark brown forest soil, loose, no rock noted that changes to rich tannish-brown loam (no rocks or gravel).	None	Soil was troweled but no artifacts were observed.
Platt Area		NE				Two holes were augered and both hit "hardpan" or rock.	None	