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Archeological Assessments at 41GL57 and 41GL91, Enchanted Rock State Natural Area, Gillespie County, Texas

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ARCHEOLOGICAL ASSESSMENTS AT 41GL57 AND 41GL91, ENCHANTED ROCK STATE NATURAL AREA, GILLESPIE COUNTY, TEXAS

by
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and
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PRINCIPAL INVESTIGATOR: Elton R. Prewitt

REPORTS OF INVESTIGATIONS, NUMBER 10

Prewitt and Associates, Inc.
Consulting Archeologists
Austin, Texas

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FOREWORD

Archeological assessments at Sites 41GL57 and 41GL91 in Enchanted Rock State Natural Area are described in this report prepared by Steven M. Kotter and Linda A. Nance. Sponsored by the Texas Parks and Wildlife Department, these assessments represent an excellent example of sensitivity to cultural resources during the planning stages of development designed to enhance visitor utilization and appreciation of Enchanted Rock.

Significant findings at Site 41GL57 include the identification of specific areas of intact prehistoric deposits which yielded artifacts of the Late Archaic and Late Prehistoric periods. Methods to achieve compatability of development plans with the preservation of the sensitive archeological materials are provided. At Site 41GL91, the prehistoric component was found to be badly disturbed and to be of insufficient integrity to warrant further archeological attention. The existing Historic Period structures at this site were all found to have been constructed after 1900; none are considered to be of archeological significance. Planned developments at Site 41GL91 will not conflict with identified significant cultural resources.

Elton R. Prewitt
Principal Investigator

FOREWORD

Archeological assessments at Sites 41GL57 and 41GL91 in Enchanted Rock State Natural Area are described in this report prepared by Steven M. Kotter and Linda A. Nance. Sponsored by the Texas Parks and Wildlife Department, these assessments represent an excellent example of sensitivity to cultural resources during the planning stages of development designed to enhance visitor utilization and appreciation of Enchanted Rock.

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ABSTRACT

Archeological testing of two sites within Enchanted Rock State Natural Area, Gillespie County, Texas, was conducted by Prewitt and Associates, Inc. during April 1980. The Texas Parks and Wildlife Department has proposed construction, associated with park development, that was in potential conflict with significant cultural resources at Sites 41GL57 and 41GL91. Sensitive areas were recognized at Site 41GL57 and recommendations are directed toward reaching compatability with the proposed construction and the significant resources. No adverse effects upon significant cultural resources were identifiable at Site 41GL91 and the present testing is considered to be mitigation of any loss of the resources.

ACKNOWLEDGMENTS

The cooperation and assistance of a number of people were necessary for the successful completion of this project. Mr. Ronald W. Ralph of the Master Planning Branch was the field coordinator for the Texas Parks and Wildlife Department. Mr. Richard Wilkinson, assisted by Mr. Ralph, provided the mapping data necessary for horizontal and vertical controls at the sites investigated.

Parks and Wildlife personnel at Enchanted Rock State Natural Area, in particular the Park Superintendent, Mr. James Wilson, were most helpful.

I also want to thank Mr. Bill Richmond, Mr. James McFarland and Mr. Charles Elkin, members of the Travis County Archeological Society, who volunteered their time and contributed materially to the completion of the project.

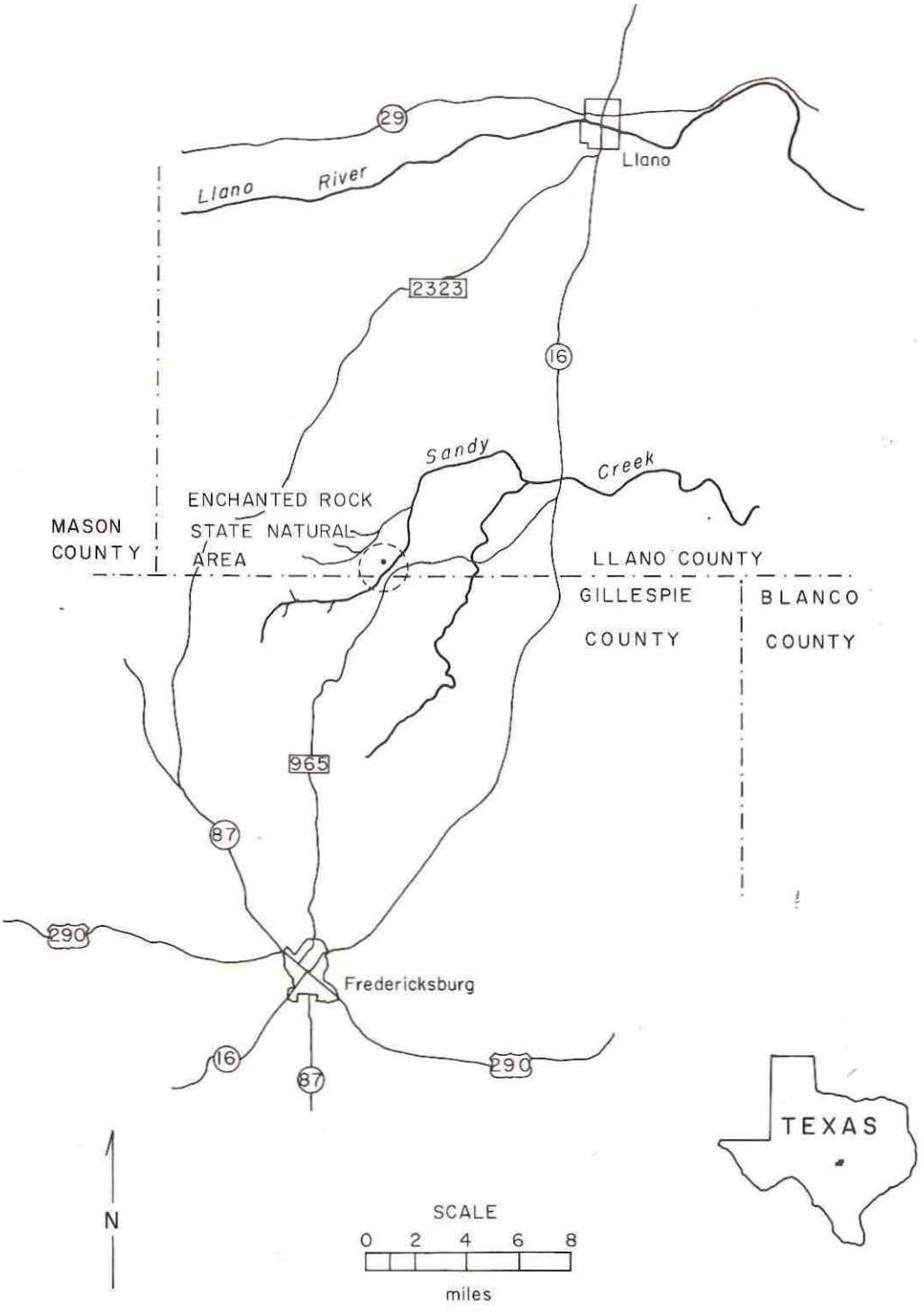
Ms. Linda Nance is responsible for the Historical Background section of the report. She also assisted in editing, typed the drafts and prepared the final copy for printing. Ms. Sandra Hannum drafted the maps and other figures; Ms. Linda Battles-Herron drew the artifact illustrations. Mr. Elton Prewitt served as Principal Investigator for the project; Ms. Jan Guy served as Archeological Assistant. Mr. Steven M. Kotter was Project Archeologist and prepared all sections of the report except the Historical Background.

A special thanks is extended to Mary Ida Ratliff Hamblin of Ponca City, Oklahoma for generously providing a collection of old photographs taken at the historic site (41GL91) and giving her permission for publication of the two photographs included herein in Figure 2.

ENCHANTED ROCK STATE NATURAL AREA

LLANO & GILLESPIE COUNTIES, TEXAS

PROJECT LOCATION MAP



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ADAPTED FROM: GENERAL HIGHWAY MAPS, LLANO & GILLESPIE COUNTIES, TEXAS, 1971

INTRODUCTION

Archeological testing of two sites within Enchanted Rock State Natural Area (Frontispiece) was conducted by personnel from Prewitt and Associates, Inc. between April 15 and April 19, 1980. The investigations were sponsored by the Texas Parks and Wildlife Department, Austin, Texas, under the supervision of Mr. Ronald W. Ralph, an archeologist in that department's Master Planning Branch. The investigations conform to the provisions of Service Agreement Contract 340-406 and Texas Antiquities Permit No. 236. The Principal Investigator was Elton R. Prewitt; fieldwork was accomplished by the Project Archeologist, Steven M. Kotter, and Archeological Assistant, Jan A. Guy.

The two sites under investigation, 41GL57 and 41GL91, are to be adversely affected by proposed construction within the park area. Testing at 41GL57, a prehistoric site, consisted of an intensive assessment of the site's character, integrity and information yield potential and was designed to provide information relative to the location of culturally sensitive areas. Recommendations developed following the completion of the testing program were specifically directed toward reaching compatability of the planned facilities development with significant cultural resources.

Site 41GL91 encompasses both a prehistoric and an historic component; the investigations at the site represent both an intensive assessment and a mitigation of the loss of the site. A significant part of the assessment of the historic component was based on the possible presence of a late nineteenth century occupation; assessment of the prehistoric component was directed toward definition of the site's character, integrity and information yield potential. Inasmuch as testing represented

the mitigation of any loss at this site, recommendations concerning the compatability of the proposed construction with significant resources were not required.

Detailed descriptions and assessments of the results of this testing program are included in this report. Recommendations concerning the culturally sensitive areas of site 41GL57 and justifications for the mitigation of site 41GL91 are also presented.

TEST METHODS AND PROCEDURES

Prior to the initiation of the testing program, an on-site inspection of sites 41GL57 and 41GL91 was conducted by Prewitt and Associates, Inc. and Texas Parks and Wildlife Department personnel. All areas to be affected by the proposed construction were reviewed and the general testing strategy was discussed. An additional walk-over by the field crew included a detailed inspection of both surface and cutbank cultural materials and distribution and a critical assessment of previous investigations at the site.

An on-site review of the testing results by the project's Principal Investigator and by an archeologist from the Master Planning Branch of the Texas Parks and Wildlife Department was made before the completion of the site investigations. Additional tests were made to define the boundaries of sensitive cultural resources following this review.

Each site was divided into impact areas based partly on site physiography and material distribution, and partly on the type of proposed construction and impact. A detailed description of the impact areas is provided by site in the body of this report.

Mapping data, including test pit and shovel probe locations and surface elevations, were provided by Texas Parks and Wildlife personnel and are used for the site maps and profiles within this report. All notes, photographs, drawings and artifacts will be placed in the files at the Texas Archeological Research Laboratory, Balcones Research Center, The University of Texas at Austin.

ENVIRONMENTAL SETTING

A detailed environmental summary of the Enchanted Rock State Natural Area within this report would be redundant, and the reader is referred to the Natural Area Survey conducted by the Lyndon B. Johnson School of Public Affairs (1979). For present purposes, a brief general summary and an environmental setting for the more limited area immediately surrounding the two sites under investigation are provided.

The granite hills which dominate the Enchanted Rock area are composed of an exposed portion of a middle Precambrian batholith which is intrusive into earlier metamorphic schists and gneiss. The granite was exposed after later sedimentary rock deposition by erosion.

The hills form a broken ridgeline which runs southwest to northeast; they are paralleled on the north by Walnut Springs Creek and on the south by Sandy Creek. Area elevation above mean sea level ranges from 1350 feet to 1825 feet. Four topographic zones are recognized for the Enchanted Rock Natural Area:

(1) the granite hills;

(2) an upland area of low rolling terrain situated between the hills and the major streams and characterized

by thin soils and frequent granite outcrops;

(3) the lower pediment flats including depositional terraces and low isolated upland remnants or similar structures; and

(4) the channels of major streams.

Area soils are within the Ligon-Keese-Eckhart association which are described as thin upland soils derived from igneous or metamorphic bedrock. Soils along the two major streams are deeper, contain less rock detritus and are formed from both alluvial and colluvial processes.

Four major vegetation associations were recognized by Butterwick (1979):

(1) a riparian deciduous woodland consisting of elm, hickory, pecan and blackjack, post and live oaks;

(2) a mesquite grassland;

(3) an oak savannah consisting of mixed scrub/grassland with pockets of oak and hickory in more protected areas; and

(4) an association occurring on the granite hills which includes lichens, mosses, ferns and shrubs.

Site 41GL57

Site 41GL57 is located north of Sandy Creek on a slight outside meander curve. The site is within the lower pediment topographic zone at an elevation of 1405 to 1425 feet m.s.l. Soils on the site include both upland and terrace soils. Both the oak savannah and mesquite grassland associations with a dense grass ground cover occur in the site area.

Site 51GL91

Site 41GL91 is located south of Sandy Creek at the margin between the lower pediment and upland topographic

zones. Elevation above m.s.l. is 1420 feet. Both upland and terrace soils are represented, as are both the riparian woodland and mesquite grassland vegetation associations.

ARCHEOLOGICAL BACKGROUND

Previous archeological investigations within the Enchanted Rock State Natural Area include two major surveys. In 1977 John W. Greer conducted what he termed an archeological reconnaissance of a large area surrounding Enchanted Rock as part of a natural area survey by the Lyndon B. Johnson School of Public Affairs (Greer 1979). An intensive archeological survey in 1979 by Cristi Assad and Daniel Potter of the Center for Archaeological Research was limited to the actual park area (Assad and Potter 1979).

Greer's primary orientation was to obtain an inventory of prehistoric use areas rather than an inventory of defined sites. His recorded localities exhibit a great size range and include many areas that would normally be considered as too small or with cultural material too sparse to be given a site designation. Greer recorded a total of 248 cultural localities; 99 of these are within the State Natural Area.

The localities are characterized as either lithic scatters or terrace sites. Lithic scatters, consisting of a few flakes to a dense concentration and usually having few or no tools, are presumed to represent small temporary camps or activity areas. Scatters are most common on the lower pediment slopes and rises along major drainages where sheet erosion has removed the thin topsoil. Greer states that his first impression of these localities was that they were entirely surficial. Subsequent shovel probes, however, indicated that usually 15-20 cm of

cultural deposition was present above bedrock or culturally sterile soils.

Terrace or midden sites were recorded primarily along Sandy Creek and were most commonly observed to be on the wide second terrace. Surface indications of prehistoric use consist of a few flakes noted in disturbances and along the terrace cutbanks. Terrace sites are characterized as very common, with the Spencer Site (41LL76) given as the best known example of this type locality.

Greer makes a number of statements concerning prehistoric land use and settlement patterning. The Paleo-Indian materials noted, mostly isolated finds along major streams, appear to indicate a fairly substantial use of the area during that time. Artifacts diagnostic of the Paleo-Indian through Early Archaic periods suggest hunting as the primary procurement strategy; this was supplemented by plant processing. During the Middle Archaic Period, a significant population or site increase and a shift in land use to include upland areas is noted. Little evidence of use during the Terminal Archaic and Transitional periods (Twin Sisters Phase) was documented. During the Late Prehistoric Period, however, the data showed an increase in the number of recorded localities and a shift to second terrace locations.

The later intensive survey by the Center for Archaeological Research (CAR) retained as sites only 54 of the 99 localities recorded by Greer. The remaining 45 localities were either not assessed as sites or were combined with other sites.

A summary statement in the CAR report that "in general sites which have the largest and most diverse artifact inventories are in areas of relatively low

elevation" (Assad and Potter 1979: 117), that is, along major streams, appears to corroborate Greer's distinction between upland and lower pediment lithic scatters and terrace sites. A quantitative breakdown of sites recorded within Enchanted Rock State Natural Area by time period (based on time-diagnostic artifacts noted at 42% of the sites recorded) and summarized below again corroborates in outline Greer's statements on land use.

Late Paleo-Indian Period	8%
Early Archaic Period	12%
Middle Archaic Period	35%
Late Archaic Period	20%
Late Prehistoric Period	25%

In addition to the intensive survey, the Center for Archaeological Research conducted limited excavation at the Spencer Site, 41LL76, and at site 41LL254; both sites are located north of Sandy Creek on second terraces.

Site 41LL76 primarily represents a Late Prehistoric occupation with possible evidence of Archaic use. The site has been heavily damaged by relic hunters; materials collected by private individuals include numerous arrow points, a few dart points, unifacial and bifacial tools, chipping debitage and bone (including bison, white-tailed deer and coyote).

A single 1x1-meter unit was excavated to a depth of one meter. From the ground surface to 25 or 30 cm the matrix was a dark brown silty loam which graded into a brown clay between 25 to 55 cm below ground surface. From 55 cm to the bottom of the unit at one meter the matrix consisted of a tan brown sandy loam; this stratigraphic unit contains pea gravel which increases noticeably in quantity with depth.

Most of the cultural material from this unit was recovered from the top 30 cm of fill. This included five tools, 269 pieces of debitage, numerous bone fragments and scattered burned rock fragments. The total of lithic artifacts by 10 cm level shows artifact frequencies per unit level ranging from one in Level 10 to 125 in Level 1.

Although no ceramic sherds were recovered from the excavation unit, a description of the sherds from the Spencer Collection was reported by Assad and Potter (1979). Most of the ceramics were typed as *Leon Plain* based on the plain, usually burnished exteriors and characteristic bone tempering. A microscopic examination of the *Leon Plain* sherds revealed granitic materials in all specimens which suggests they are of local manufacture. A number of brushed ware sherds with grog temper and no trace of granitic minerals were also examined. These sherds appear to be similar to ones typical of East Texas ceramic inventories.

Site 41LL254 contained cultural materials primarily from the Early and Middle Archaic Periods, with a possible Late Archaic and probable Late Prehistoric component. The materials recovered during excavation include projectile points, biface fragments, utilized and retouched flakes, lithic debitage, grinding stone fragments and animal bone.

The excavated 1x1-meter unit reached a depth of 1.5 meters before it was abandoned without encountering a culturally sterile zone. Soil from the surface to 65 cm below ground surface was a dark brown silty loam changing to a lighter colored clayey loam between 65-105 cm. Beneath the clayey loam the soil continued to lighten, becoming a silty to sandy loam with an orange cast.

A total of 12,813 lithic artifacts was recovered; included are 131 tools and 12,682 pieces of debitage. Four burned rock features (roughly circular concentrations varying in size from 30x30 cm to 60x56 cm) were identified along with other scattered burned rocks and numerous bone fragments. Artifact frequencies per unit level range from a low of 103 in Level 15 to 1,979 in Level 10.

HISTORICAL BACKGROUND

Enchanted Rock falls within the area of Texas known as the Central Mineral Region. The first European to pass through the area appears to have been Alvar Nunez Cabeza de Vaca in 1535; he encountered bands of Tonkawa who were well established in the area. For the next 200 years this section of Texas was largely ignored by the Europeans, and it was not until the 1700's that expeditions to the Central Mineral Region began on a regular basis. Indian reports of a mountain of red ochre -- the *cerro del almagre* -- suggested to the Spaniards the presence of mineral-bearing ores. Their efforts to establish silver mines in the region never produced the anticipated results, and the only real profits to come out of the ground in the region have come from limestone and red granite quarries. Several other Spanish expeditions also penetrated the area during the 1700's in an unsuccessful effort to control hostile Indian depredations and to establish missions in the region. A detailed historical background of the area may be found in Weddle (1979) and will not be repeated here.

Although the major portion of Enchanted Rock State Natural Area falls within Llano County, the two sites investigated herein are located near Sandy Creek in

Gillespie County in the southwestern segment of the property. It was not until the mid-1800's that Gillespie County was first permanently colonized by Europeans when a group of German settlers led by John O. Meusebach settled in the area and founded Fredericksburg on May 8, 1846; the county was subsequently created out of Travis and Bexar counties in 1848 (Webb and Carroll 1952: I, 690).

The earliest record of a survey of Enchanted Rock is the Anavato Martinez Survey No. 475 situated in Llano and Gillespie counties. Anavato Martinez and his wife, Maria Jesusa Trevino de Martinez, were issued a headright certificate for one league and one labor on March 16, 1838. On October 8, 1841, they sold to James Robinson who later sold it to Samuel A. Maverick on October 25, 1844. Maverick was evidently interested only in the mineral resources and never resided upon this land; when his widow subsequently sold to N. P. P. Browne in 1880 and 1881, she reserved the mineral rights. On February 19, 1886, Browne and his wife sold it to John R. Moss, who retained it only a short time selling to J. D. Slator later that same year.

Slator sold the land to C. T. and A. F. Moss on February 8, 1895. In 1897 the Moss brothers partitioned their property with the exception of the area upon which the major portion of Enchanted Rock stands since they "desired to hold [it] in common." C. T. Moss eventually became the sole owner, and in 1927 it passed through inheritance to his son, Tate. Albert Faltin bought the land on October 26, 1946, but on August 6, 1947, he sold a one-half interest in the property to Charles H. Moss, a grandson of C. T. Moss (Kowert 1968).

Mr. Moss operated a privately-owned park at Enchanted Rock for many years. In 1971 it was designated

as a Natural Landmark by the U.S. Department of Interior, National Park Service, and after purchase of the property from Charles Moss by the State of Texas, the Parks and Wildlife Department began operation of the site as a State Natural Area on June 7, 1978.

The historic site investigated during this project, 41GL91, is currently being used by the park staff as a temporary maintenance facility and for tool storage. The site consists of a residence, a water well, a barn and livestock pens. Mr. Eric Slator (1980), presently of Llano, Texas, was born in 1892 in a house which previously existed about 200 to 300 feet from the location of the present structure. Mr. Slator's family left the property in 1895 and sometime after that date the structure burned down. According to Mr. Slator, the structure presently standing was built by C. T. Moss in 1907 as a residence for Tom Ratliff (Fig. 1b). The Ratliff family was the first to move into the house on February 4, 1907, remaining there until 1926 at which time the chimney was built (Hamblin 1980). Mrs. Charles Moss (1980), the wife of the most recent landowner who is himself a descendant of C. T. Moss, reports that at one time an old log cabin (Fig. 1a) stood across Sandy Creek; this cabin was later moved to the present site location. Rafe Maner, an emancipated slave, lived in the log cabin from his birth in 1850 until his death in 1920; the cabin was torn down in the late 1960's (Hamblin 1980).

SITE 41GL57

Archeological Background

Site 41GL57 was originally recorded by Greer (1979) as two prehistoric cultural localities, sites 41GL57 and 41GL58, as described below.

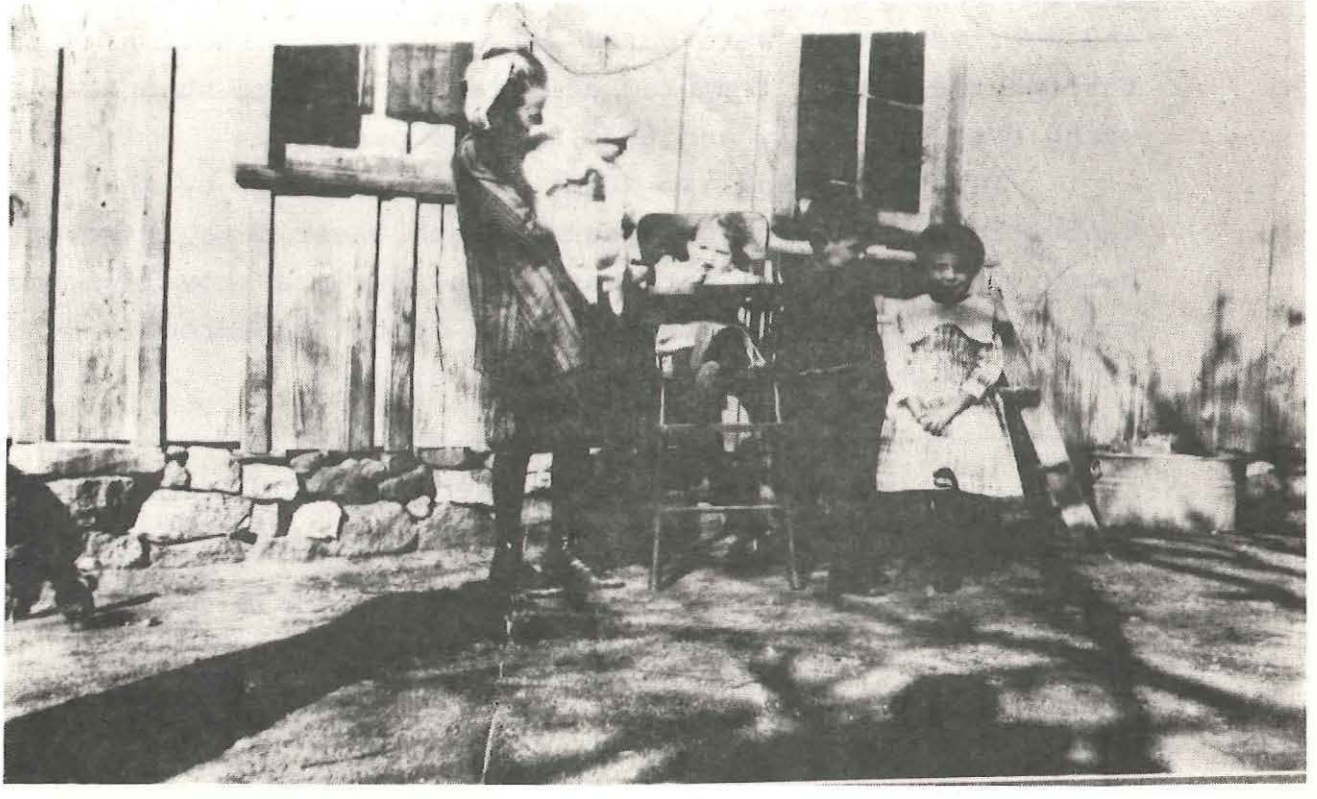
Figure 1. Photographs taken in the early twentieth century at 41GL91.

a. Tom Ratliff on horse in front of log cabin on left and grain storage building on right. Rafe Maner lived in the log cabin from his birth in 1850 until his death in 1920. The cabin was torn down in the late 1960's.

b. Photograph of south side of house taken in 1920. Four of the five children were born in the house. Note board and batten construction and stone foundation footing.

Figure 1

a



b

Locality Number	Description	Location	Size	Flake Density	Artifacts
7 (41GL58)	Lithic scatter	Lower bench hillock	25x50 meters	Moderate	Mano cores
29 (41GL57)	Lithic scatter	Lower hillock	16x30 meters	Sparse	Metate and mano fragments

The survey conducted by the Center for Archaeological Research recorded a single site, 41GL57; sites 41GL57 and 41GL58 as recorded by Greer were combined into one site with the dimensions given as 97x110 meters (Assad and Potter 1979).

Site 41GL57 was characterized as a light to moderate density lithic scatter with ground stone artifacts, cores, a chopper and a large tested cobble observed. Three projectile points, a *Nolan*, an *Ensor* and a *Frio*, burned rocks and chert debitage were noted after road construction through the site. Temporal affiliation is suggested as being both the Early and Late Archaic periods.

Two shovel and two auger tests were made by the Center for Archaeological Research and their data is given below. No locational data was given, but the shovel probes and probably the auger tests have a depth to bedrock similar to the low rise area of the site.

Debitage Count	Artifacts	Primary Vertical Distribution	Total Depth of Test (Termination)
ST-1 7	1 retouched flake	0-15 cm	40 cm (bedrock)
ST-2 10		0-30 cm	30 cm (clay and gravel)

AUGER TEST

AT-109	Total Depth - 44 cm	3 (debitage count)
AT-110	Total Depth - 15 cm	3 (debitage count)

Site Descriptions and Testing Strategies

Site 41GL57 is located on a series of low rises described during previous investigations as lower hillocks (Greer 1979) and a low ridge segment (Assad and Potter 1979). These rises are part of the gently sloping granitic pediment situated setween the actual granite hills and the major stream terraces. The rises have been isolated from the main area of the pediment by stream downcutting associated with the unnamed drainage that forms the northern boundary of the site.

To the south, east and west of the low rises are depositional terraces developed from both Sandy Creek and the unnamed drainage bank overflow. The site boundary was extended by Assad and Potter (1979) to include a portion of the terrace area south of the rises toward Sandy Creek. The terrace areas east and west of the rises had no surface indications of cultural materials and were not considered as part of the site area.

Figure 2 is a site location map showing the placement of test units within the site. Four impact areas were defined, based partly on natural physiographic divisions (low rises and terrace areas) and partly on differences in proposed construction and impact.

Impact Area 1:

These are the low rises believed to be the main site area (Fig. 3a). Impact from the proposed construction will include:

(1) significant disruption within the western half of the rise area along the base of the rising slope (toward Sandy Creek) for day-use parking; and

(2) localized significant disruption at the eastern end of the rise area by trenching and for proposed utilities.

Archeological testing was limited to the western half of the rise. Two lxl-meter units, Test Pits 2 and 3, were placed to test the base of the slope toward Sandy Creek while Shovel Probes 1 and 2 were placed on the crest of the rise in this area. Although the rise crest will not be affected by the proposed construction, the probes were necessary to provide an intensive assessment of the site.

Impact Area 2:

Impact Area 2 (Fig. 3b) is the portion of depositional terrace south of the rise area toward Sandy Creek. The northern and eastern boundaries are defined by an existing park road from the temporary park entrance to a temporary primitive camping area west of the site. The southern boundary is the stream channel of Sandy Creek; the western boundary is a line running due south from the western end of the rise.

Impact from the proposed construction will include:

(1) severe disruption near the bend in the existing park road for a comfort station and trenching for utility lines; and

(2) significant disruption along the northern boundary of the area (existing park road) for the day-use parking discussed for Impact Area 1 above.

FIGURE 2

ENCHANTED ROCK

41 GL 57

SITE LOCATION MAP

FIGURE REDACTED

Figure 3. Photographs - Site 41GL57

a. General view of Impact Area 1 from the existing park road north toward Enchanted Rock. The proposed parking area will be extended from this road to the area of Test Pit 2 (figure is at test pit location).

b. General view of Impact Area 2 from the existing park road south toward Sandy Creek. Figure is at the location of Test Pit 1 and proposed comfort station.

c. General view of Impact Area 3 looking north toward Enchanted Rock. Figure is at the location of Test Pit 5.

d. North wall of Test Pit 1 to the bottom of Level 6 (60 cm below the surface). Darker soil at the bottom of profile is a clayey loam underlying a lighter silty loam. Tape is extended 20 cm and points north.

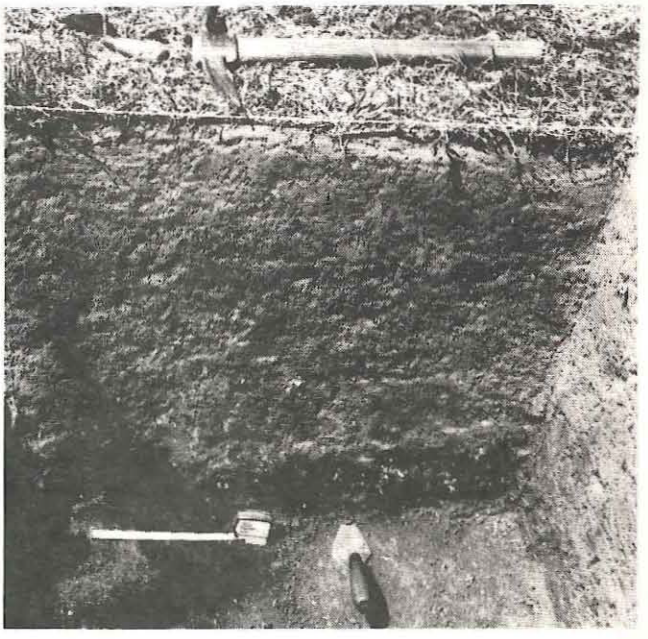
Figure 3

FIGURE REDACTED

a

b

FIGURE REDACTED



c

d

Two 1x1-meter units, Test Pits 1 and 4, were placed within the actual impact area of the proposed comfort station; Shovel Probes 3, 4, 5 and 6 are within the area to be affected by day-use parking expansion.

Impact Area 3:

Impact Area 3 is the portion of depositional terrace east of the existing park road between the eastern end of the low rise area and Sandy Creek (Fig. 3c). The area will be affected by proposed trenching for a dispersion field associated with the comfort station primarily in the northern area of the terrace nearest the low rise. Shovel Probes 7, 8 and 9 and one 1x1-meter unit, Test Pit 5, were placed to test the area of impact.

Impact Area 4:

This terrace area is located north of the existing park road and west of the rise area. A proposed turning loop will affect a large portion of Impact Area 4. Testing was limited to three shovel probes, Probes 10, 11 and 12.

Soils

The following soil description for site 41GL57 is based on data from the five 1x1-meter units and twelve shovel probes. The data from measured profiles for four of the 1x1-meter units (Figs. 3d and 4a) are summarized in Table 1; measurements given are depths below ground surface, and the depth of the bottom of each unit is given within parentheses.

The probable relationship between the defined soil zones is shown in Figure 5a, a profile running north to south through the center of the site, and in

TABLE 1

SUMMARY OF SOIL STRATIGRAPHY AT 41GL57

Unit	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Granite Bedrock
TP1 (Fig. 3d)	0-10 cm	10-40 cm	40-75 cm	75-(100) cm	-	-
TP2 (Fig. 4a)	0-5 cm	5-20 cm	-	20-(40) cm	-	35 mm NE corner only
TP3	0-7 cm	7-25 cm	-	25-(30) cm	25 cm NW corner only	
TP5	0-15 cm	15-(40) cm		-	-	-

Figure 5b, a similar profile through the western end of the site.

Differences in soil stratigraphy between the low rise and terrace areas of the site, most notably in Zones 2 and 3, are most likely due to alluvial processes associated with Sandy Creek.

Defined Soil Zones:

Zone 1: Zone 1 is not present in all units and is in general similar to Zone 2. Where distinct, Zone 1 is lighter and appears to have less gravel content. The bottom of the grass roots generally coincides with the bottom of this zone.

Zone 2: Zone 2 is a sandy silt or sandy loam which varies dependent on the dominant influence on soil development. On the low rise at the north end of the site this zone is dark reddish brown and contains numerous pea-sized and smaller gravels,

Figure 4. Photographs - Sites 41GL57 and 41GL91

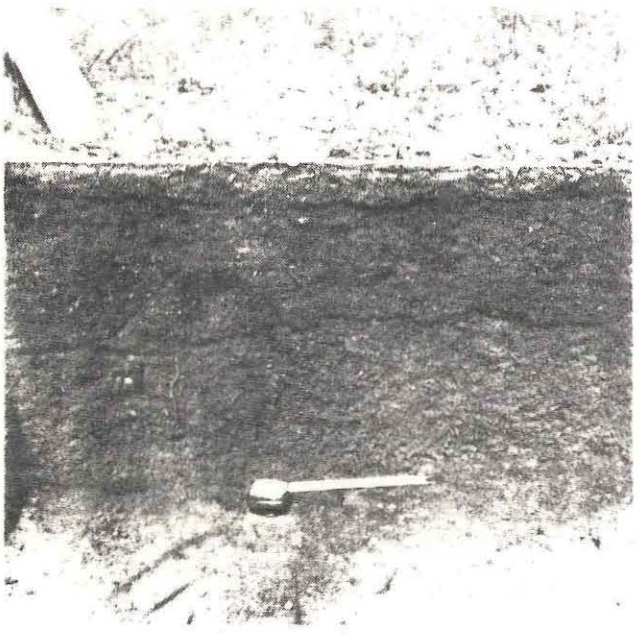
a. Site 41GL57. West wall of Test Pit 2 to the bottom of Level 4 (40 cm below the surface). Soil strata are delineated by horizontal lines drawn with trowel. Tape is extended 20 cm and points north.

b. Site 41GL57. The floor of Level 2, Test Pit 2 (20 cm below the surface) showing living surface consisting of burned rocks and lithic debitage. View facing east with tape extended 20 cm and pointing north.

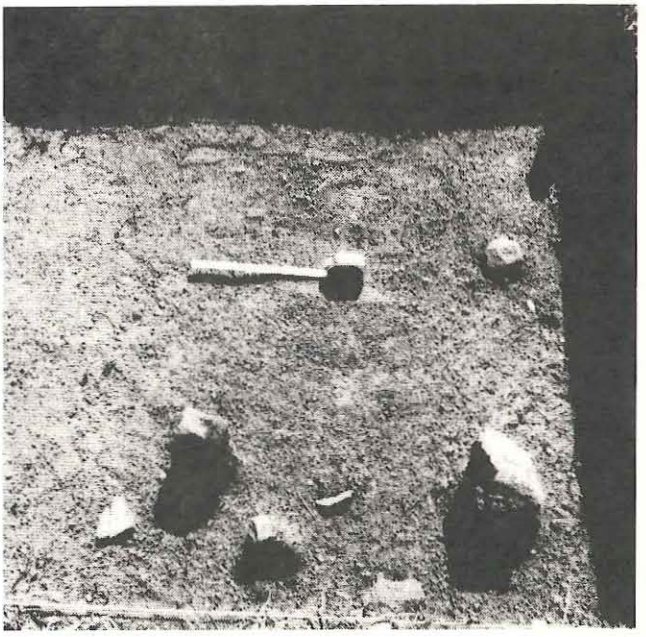
c. General view of historic structures, site 41GL91, looking north-northwest toward Little Rock. The front of the house structure and various outbuildings are visible.

d. General view of Impact Area 2, site 41GL91, looking north toward Sandy Creek and Enchanted Rock. Figure is at the location of Test Pit 1.

Figure 4



a



b

FIGURE REDACTED

c

d

while within terrace deposits the zone is dark brown to very dark brown with similar gravels varying from numerous to absent. Small tree roots were most common in Zone 2.

Zone 3: Zone 3 is a dark brown clay loam with varying amounts of pea-sized and smaller gravels. This zone occurred only within terrace deposition and was generally without noted disturbances.

Zone 4: Zone 4 is a light reddish-brown sandy silt with numerous marble-sized and smaller gravels. The zone occurred throughout the site invariably just above granite bedrock or dense red clay.

Zone 5: Zone 5 is a dense red clay. It is felt that the clay occurs just above granite bedrock. The zone was noted only in one unit at the base of the low rise at the northern end of the site, and it is unknown if the clay occurs in isolated pockets or is more widespread.

Results of Testing

Two primary types of results are used in the assessment of the cultural resources at site 41GL57:

(1) density values expressed as the total number of artifacts per 1x1-meter unit 10-centimeter thick level; and

(2) the presence or absence of recognized cultural living surfaces or intact features. Density values for the shovel probes were obtained by dividing the total number of artifacts by the number of 10-centimeter levels excavated multiplied by 16 (the number of 25x25-centimeter units in a 1x1-meter unit).

The results of the testing program at site 41GL57 are given in Table 2, a summary of test pit data by level;

FIGURE 5

ENCHANTED ROCK

41 GL 57

NORTH TO SOUTH PROFILES

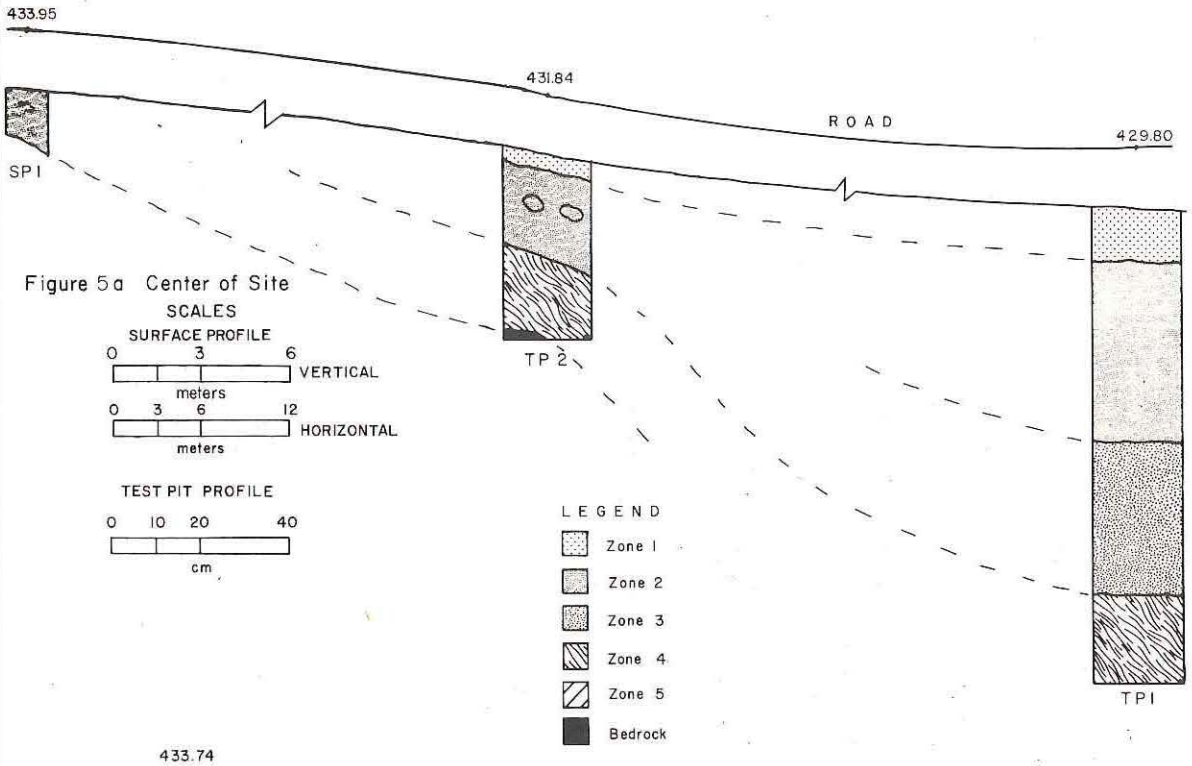


Figure 5a Center of Site

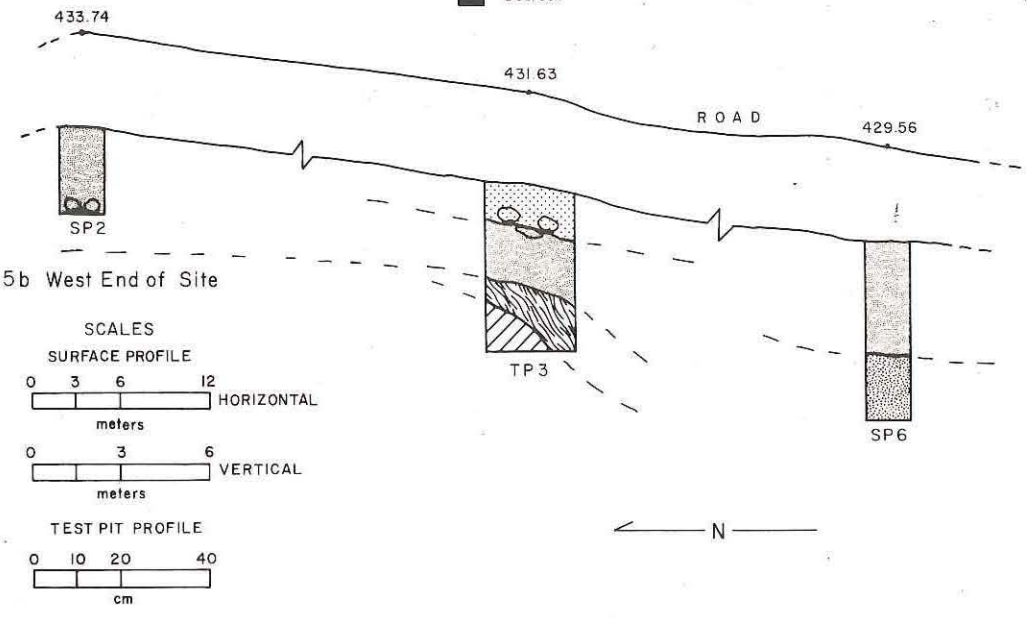


Figure 5b West End of Site

P&AI/80/SLH

TABLE 2

SUMMARY OF TEST PIT DATA BY LEVEL AT 41GL57

Test Pit and Level	Depth Below Ground Surface	Disturbances	Cultural Features	Artifact Density per 1x1-meter 10-cm Level
TP1, L1	0-10 cm	Grass roots; minimal 1 cm tree root disturbance	None	5
TP1, L2	10-20 cm	Moderate tree root disturbance	None	5
TP1, L3	20-30 cm	Moderate tree root disturbance; 1 vertical mold (15 cm diameter)	None	4
TP1, L4	30-40 cm	Moderate tree root disturbance	None	3
TP1, L5	40-50 cm	Minimal tree root disturbance	None	5
TP1, L6	50-60 cm	None noted	None	6
TP1, L7	60-70 cm	None noted	None	2
TP1, L8-10	70-100 cm	None noted	None	0
TP2, L1	0-10 cm	Grass roots	The top of surface described below at floor level	12
TP2, L2	10-20 cm	Moderate tree root disturbance; vertical and horizontal molds noted	Living surface consisting of burned rocks and associated artifacts	7

TABLE 2, continued.

Test Pit and Level	Depth Below Ground Surface	Disturbances	Cultural Features	Artifact Density per 1x1-meter 10-cm Level
TP2, L3	20-30 cm	Minimal tree root disturbance	None	3
TP2, L4	30-40 cm	Minimal tree root disturbance	None	3
TP3, L1	0-10 cm	Grass roots	Living surface consisting of scattered burned rocks and associated artifacts	48
TP3, L2	10-20 cm	Minimal vertical rodent disturbance	None	20
TP3, L3	20-30 cm	None noted	None	2
TP4, L1	0-10 cm	Grass roots	None	2
TP4, L2	10-20 cm	None noted	None	6
TP5, L1	0-10 cm	Grass roots	None	20
TP5, L2	10-20 cm	Minimal tree root disturbance	None	15
TP5, L3	20-30 cm	Moderate tree root disturbance	None	14
TP5, L4	30-40 cm	Moderate tree root disturbance; minimal rodent disturbance	None	8

Table 3, a summary of the same data for all levels; and Table 4, a summary of shovel probe data.

The range of artifact densities and the extent of the recognized living surfaces are plotted in Figure 6a, a north-south profile, and Figure 6b, an east-west profile. The graphs primarily show the differences between the low rise area of the site and the surrounding terrace. Some overlap of high relative artifact densities occurs in terrace areas near the rise, but the recognizable cultural surface is limited to the rise crest and slope.

Site Assessments and Recommendations

Impact Area 1:

Testing of the low rise demonstrated that this area is indeed the main site area and that the cultural resources present are intact and are assessed to be significant. It is recommended that construction of day-use parking should be avoided in this area in favor of placement on the terrace south of the existing park road.

The low rise area of site 41GL57 will also be affected by proposed trenching for utilities at the eastern end of the rise. Although no test units were placed in this area, the above assessment of significant cultural resources applies to the entire rise area. It is recommended that plans to extent utilities beyond the proposed comfort station be abandoned. The alternative is that the utility lines from the comfort station to the trail head kiosk be placed along the existing trail and that continual archeological monitoring be accomplished during the trenching; if intact archeological features or concentrated occupational debris is encountered, then construction should be suspended until thorough archeological investigations can be accomplished.

TABLE 3

SUMMARY OF TEST PIT DATA FOR ALL LEVELS AT 41GL57

Test Pit	Primary Vertical Occupation	Artifact Density per Unit Level	Cultural Features
TP1	No definable primary occupation	4.29	None recognized
TP2	Levels 1 & 2	9.50	A definable living surface associated with Levels 1 and 2
TP3	Levels 1 & 2	34.0	A definable living surface associated with Levels 1 and 2
TP4	No definable primary occupation	3.0	None recognized
TP5	Levels 1, 2 and 3	16.33	None recognized

TABLE 4

SUMMARY OF SHOVEL PROBE DATA AT 41GL57

Shovel Probe	Depth Below Ground Surface	Cultural Features	Total Artifacts	Projected Density per 1x1-meter Unit, 10-centimeter Level
1	15 cm	None	3	32
2	20 cm	Tight cluster of burned rocks, part of an unidentified feature	4	32
3	40 cm	None	4	16
4	40 cm	None	0	no recovery
5	40 cm	None	4	16
6	40 cm	None	3	12
7	65 cm	None	5	12
8	29 cm	None	1	5.3
9	46 cm	None	9	31.2
10	50 cm	None	6	30
11	55 cm	None	5	16
12	50 cm	None	0	no recovery

FIGURE 6

ENCHANTED ROCK

RANGE OF ARTIFACT DENSITIES & EXTENT OF RECOGNIZED LIVING SURFACES AT 41 GL 57

Figure 6a North / South Artifact Density Profile

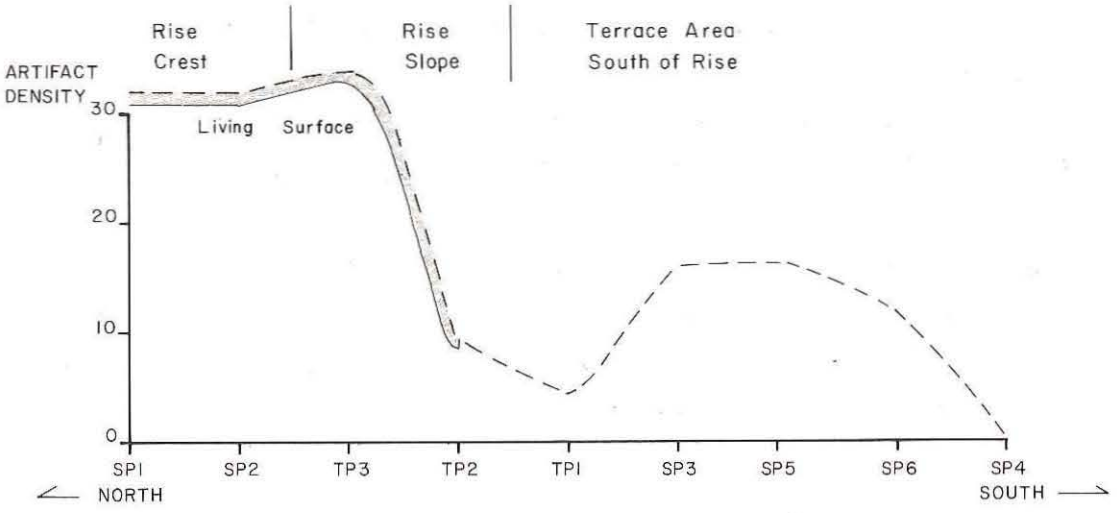
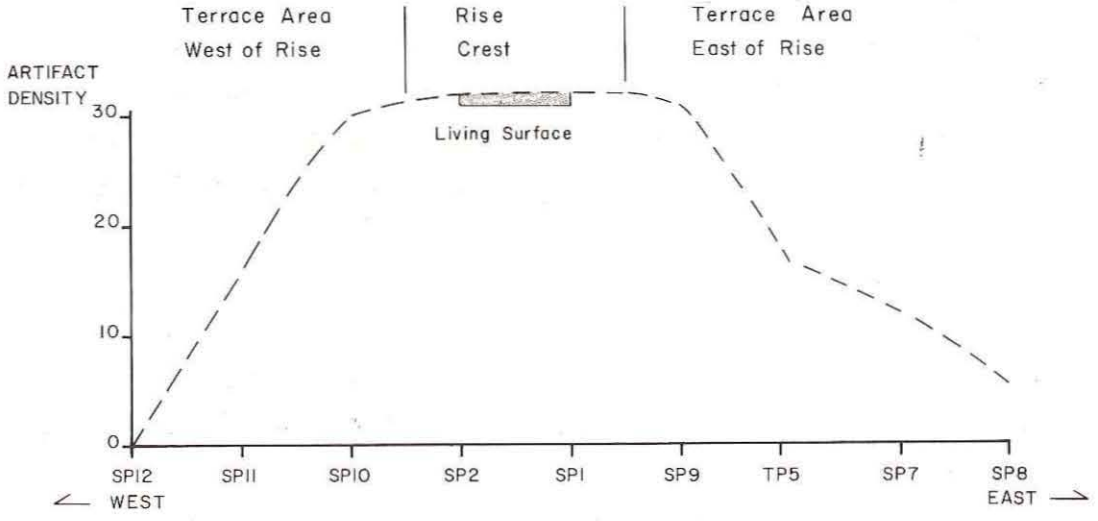


Figure 6b East / West Artifact Density Profile



PBAI/80/SLH

Impact Area 2:

The only culturally significant recovery from the terrace area south of the rise was a ceramic sherd from Level 1 (surface - 10 cm). Artifact densities from this level, however, were too low to indicate a significant occupation.

No significant cultural resources appear to be present in this portion of the terrace, and it is recommended that:

(1) the comfort station and all utilities be limited to the area south of the existing park road; and

(2) any day-use parking construction be limited to this area rather than the rise north of the existing park road.

Impact Area 3:

Within this impact area, the cultural materials collected from Test Pit 5 and Shovel Probe 9 are felt to be significant; cultural materials from Shovel Probes 7 and 8 are not significant. The area containing sensitive material should be avoided; otherwise, monitoring as specified for the utility lines will be required. The major portion of the terrace away from the rise and toward the creek is not considered to be archeologically sensitive.

Impact Area 4:

Significant cultural resources were recognized only in the area immediately west of the rise. The terrace area west of Shovel Probe 10 is not considered to be archeologically sensitive.

The assessments and recommendations for Site 41GL57 are summarized in Table 5.

TABLE 5

SUMMARY OF ASSESSMENTS AND RECOMMENDATIONS AT 41GL57

Tested Areas	Assessment	Recommendations
The main site area on low rises north of the existing road	Significant cultural resources exist including features and living surfaces	Area should be avoided; any impact should be limited to south of the existing road
The terrace south of the existing road	No significant cultural resources exist	No special precautions are necessary
The terrace area east of the known site boundaries	Abuts edge of significant cultural resources	Avoid encroachment on northwest side of terrace adjacent to main site on rise
The terrace area west of the known site boundaries	Abuts edge of significant cultural resources	Avoid encroachment on northeast side of terrace adjacent to main site on rise

SITE 41GL91

Archeological Background

Site 41GL91 is composed of both a prehistoric and an historic component which were recorded by Greer (1979) as Localities 16 and 17; his descriptions are summarized below. Greer's reported date of the 1880's for the historic component was apparently based on an informant's

recollection rather than evidence from the site.

Description	Location	Size(m)	Flake Density	Artifacts	Recommendations	NR
Locality 16; old ranch house, part reputedly from 1880's (see No. 17 for aboriginal component)	Lower bench, above spring	60x60	N/A	Buildings equipment tools etc.	Historical background	No
Locality 17; lithic scatter (aboriginal component of No. 16); disturbed by ranch activities	Lower bench	65x65	Moderate	Ret. flake	Small test	No

The site was visited and reassessed by Assad and Potter (1979) who attempted a number of subsurface probes. Their conclusion was that the prehistoric component had been severely affected by later historic use. Material noted included two mano fragments, two cores, a uniface, a large granite metate and a sparse scatter of flakes, all apparently surficial. No temporally-diagnostic artifacts were noted. The description of the historic component of site 41GL91 was substantially the same as Greer's, including mention of the possible 1880's occupation.

Site Description and Testing Strategies

Site 41GL91 is located on the base of an upland granite ridge slope and depositional terrace of Sandy

Creek, described by Greer (1979) as a lower bench and by Assad and Potter (1979) as the margin between the lower pediment and upland zones. The site as previously recorded did not include the terrace location.

Site 41GL91 has a prehistoric and an historic component; the boundaries of the two generally coincide (Fig. 7). The historic component (Fig. 4c) consists of a house, several outbuildings and a corral enclosed by a barbed wire perimeter fence; a smaller fenced area south of this house compound toward Sandy Creek; and an associated artifact scatter. The prehistoric component consists of a surficial artifact scatter within the historic house compound and flakes noted in rodent backdirt in the small fenced terrace area to the south (Fig. 4d).

Two physiographic areas of the site were recognized during the archeological investigations -- the granite slope and the terrace. Impact on each area as a result of construction of the park headquarters and interpretive complex will be the same, namely total loss of any cultural resources. The testing completed therefore represents both an assessment and mitigation of any loss.

Impact Area 1:

The granitic slope area of site 41GL91 is the location of the main portion of the historic site and consists of the house structure, a number of outbuildings and most of the corral and barn complex. A thorough inspection of this area, including a number of informal shovel probes, was made.

Impact Area 2:

Impact Area 2 includes the terrace situated

between the granite slope and the stream channel of Sandy Creek. Archeological testing consisted of one 1x1-meter unit, Test Pit 1.

Soils

The following soil description for site 41GL91 is derived from a 1x1-meter control unit, Test Pit 1 (Fig. 8) and a number of informal shovel probes.

The southern part of the site, within the house compound, is a granitic rise where soil depth above bedrock varies from 5 to 10 cm with a few small granite outcrops in the extreme southern end of the site. The matrix above bedrock is a reddish-brown sandy silt with a high gravel content. The main compound area is obviously deflated and washed, exposing soil similar to Zone 3 described below and resulting in the loss of matrix and concentration of gravels.

North of the granite rise is a narrow strip of terrace deposition which abuts bedrock to the south and ends at the right-hand cutbank of Sandy Creek. Terrace depth at the cutbank is approximately one meter. The terrace deposits show a distinct zonation as profiled in the east wall of Test Pit 1.

Defined Soil Zones:

Zone 1: Surface to 30 cm. Zone 1 is a light brown sandy silt with numerous pea-sized and smaller gravels. The top 10 cm of the zone contained grass roots with most tree roots in the bottom 20 cm. Rodent disturbance was widespread with a large and active horizontal tunnel from 15 to 30 cm below ground surface.

FIGURE 7

ENCHANTED ROCK

41 GL 91

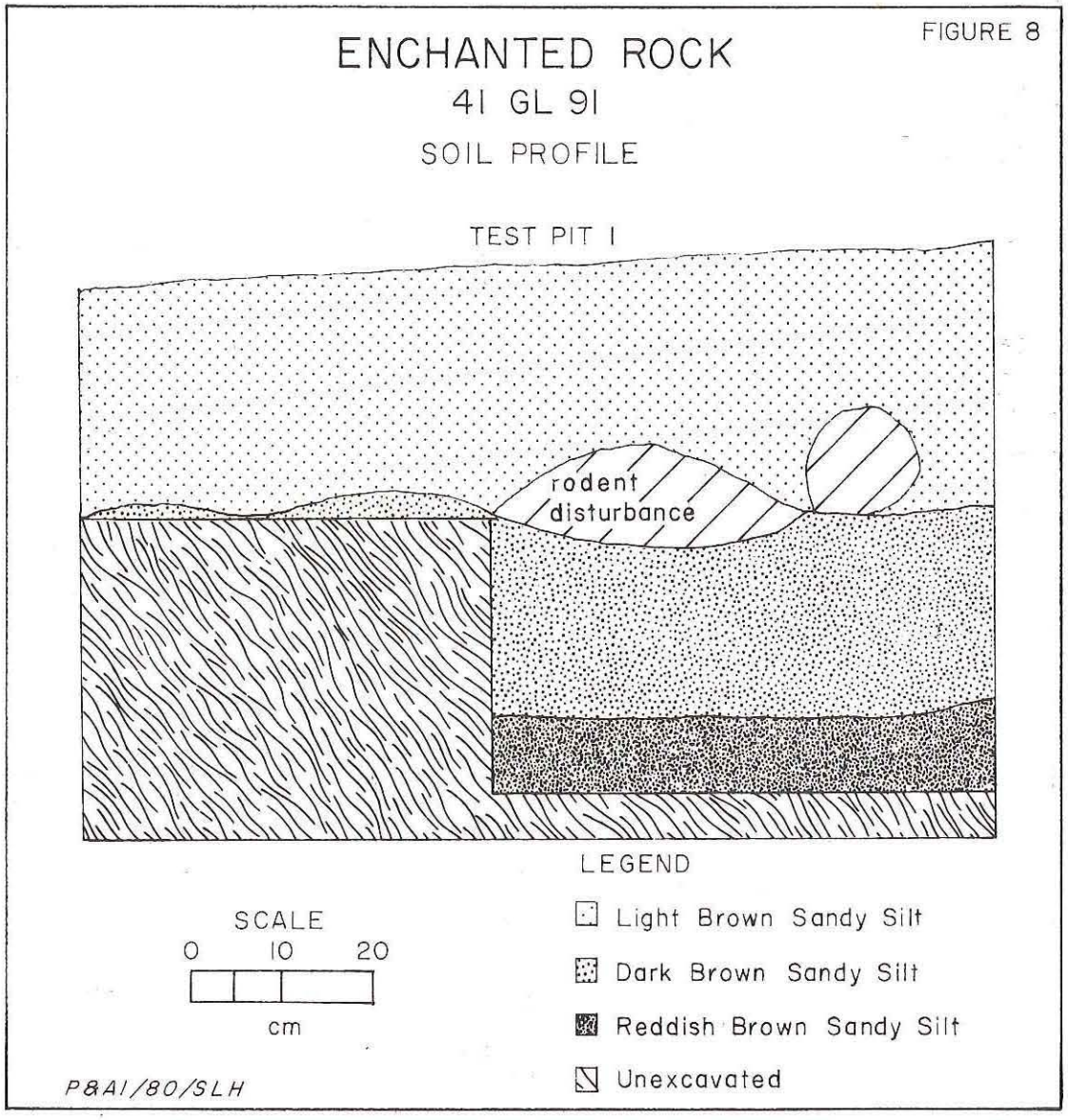
SITE LOCATION MAP

/ /

FIGURE REDACTED

Zone 2: 30 to 50 cm. Zone 2 is a very dark brown to black sandy silt with moderate amounts of pea-sized and smaller gravels. Disturbances, primarily from rodents, are moderate to absent.

Zone 3: Beginning at 50 cm. Zone 3 is a reddish-brown sandy silt with numerous marble-sized and smaller gravels. No disturbances were noted within this zone.



Results of Testing

The results of testing given for the prehistoric component of site 41GL91 were derived by the same format as for site 41GL57. The data is for the terrace (Impact Area 2) only; the data collected for the granite slope was informal.

Table 6 is a summary of Test Pit 1 by level. The primary vertical occupation occurred in Levels 2, 3 and 4 with an artifact density per level of 20.66 and no recognized cultural features encountered.

Site Assessments and Recommendations

Impact Area 1:

Inspection and informal shovel probes in this area showed that no intact cultural materials are present. The granite rise is severely deflated and washed with all artifacts displaced; this area is not considered to be archeologically sensitive.

Impact Area 2:

Testing in the terrace area of the site where cultural materials occur was designed to determine the date of occupation for the historic component and data relative to the assessment of the prehistoric component. No historic artifacts were collected which provide any indication of use of the site before 1900. Although the prehistoric materials indicated site densities which could be considered as culturally significant, severe rodent disturbance has disrupted the deposits. Impact Area 2 is not considered to be archeologically sensitive.

A summary of the assessments and recommendations for site 41GL91 is provided in Table 7.

TABLE 6

SUMMARY OF PREHISTORIC TEST PIT DATA BY LEVEL AT 41GL91

Level	Depth Below Ground Surface	Disturbances	Cultural Features	Artifact Density per 1x1-meter 10-cm Level
L1	0-10 cm	Vertical rodent burrowing; grass roots	None	6
L2	10-20 cm	Severe horizontal rodent burrowing	None	17
L3	20-30 cm	Severe horizontal rodent burrowing	None	21
L4	30-40 cm	Moderate horizontal rodent burrowing	None	12(24)*
L5	40-50 cm	No disturbances noted	None	7(14)**
L6	50-60 cm	No disturbances noted	None	4(8)**

*inflated by rodent cache

**0.5x1-meter unit projected for 1x1-meter recovery in unit in parentheses

TABLE 7

SUMMARY OF ASSESSMENTS AND RECOMMENDATIONS AT 41GL91

Tested Areas	Assessment	Recommendations
Area within the main house compound on granite rise	No significant cultural resources exist	No precautions necessary
Area between house complex and Sandy Creek, terrace	No significant cultural resources exist	No precautions necessary

PREHISTORIC ARTIFACT DESCRIPTIONS

Six general artifact categories are represented by the cultural materials recovered during the testing program from sites 41GL57 and 41GL91. The totals for each category by site are given in Table 8 below. Burned rocks were not counted except as part of a recognized living surface or feature, a discussion of which appears later in the report.

TABLE 8

PREHISTORIC ARTIFACT CATEGORIES

	41GL57	41GL91
Lithic tools/other	8	4
Lithic debitage	227	55
Ceramics	1	0
Bone tools	0	1
Bone	0	6
Burned rocks	scatter on living surface	scattered

Lithic Tools

The lithic tool artifact category includes projectile points, partially reduced bifaces, other bifacially-worked artifacts, flake tools and utilized flakes.

Projectile Points:

Two dart points (Fig. 9a, e) and two arrow points (Fig. 9d) were recovered and are summarized below.

	Point Type	Provenience	Age and/or Cultural Affiliation
Arrow points	*Scallorn*	41GL91	Austin Phase
	mid-section fragment	41GL57	Undifferentiated Late Prehistoric
Dart points	*Castroville*	41GL91	San Marcos II Phase
	Frio	41GL57	Twin Sisters Phase

Only the *Frio* type projectile point was complete enough for further analysis.

Total Length:	21 mm
Base Width:	-
Haft Length:	9 mm
Neck Width:	12.5 mm
Base Depth:	-
Thickness:	5 mm
Basal Grinding:	No
Beveled Blade:	No
Beveled Stem:	No
Serrated:	No

Bifaces Other Than Projectile Points:

One partially reduced biface with a plano-convex cross section was recovered from site 41GL91. The biface was apparently discarded as a manufacturing failure due to excessive thinning of the pointed end.

Dimensions:	Length	Width	Thickness
	77 mm	50 mm	17 mm

Four miscellaneous bifacially-worked artifacts (Fig. 9c), all apparently flake and biface production debitage, were collected.

Description	Site	Length	Width	Thickness
Core reduction biface	41GL57	37 mm	25 mm	9 mm
Possible core fragment	41GL57	-	-	-
Bifacially-worked flake	41GL91	34 mm	26 mm	8 mm
Bifacially-worked fragment	41GL57	-	-	-

Flake Tools:

One flake tool, a concave scraper made on an angular chunk, was collected from site 41GL57 (Fig. 9b).

Utilized Flakes:

Four utilized (edge-damaged) flakes were recognized and are summarized below.

Debitage Category	Provenience	Working Surface	Length	Width	Thickness
complete interior flake	41GL91	lateral edge; retouch on ventral surface	37 mm	20 mm	4 mm
complete interior flake	41GL57	lateral edge	9 mm	17 mm	2.5 mm
interior chip	41GL57	tool fragment; retouch on dorsal surface	-	-	-
complete secondary flake - cortex at platform only	41GL57	distal end retouch on ventral surface	9 mm	14 mm	2 mm

Lithic Debitage

Four basic lithic debitage categories are recognized for this report:

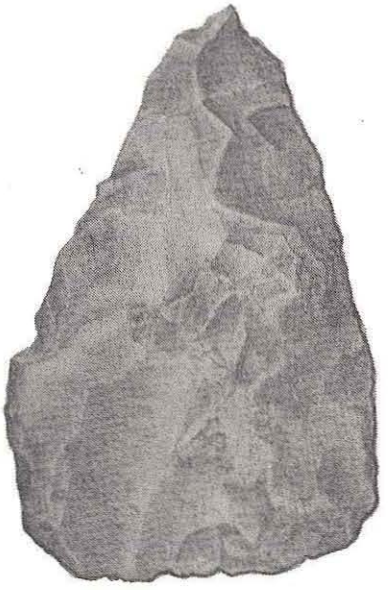
Figure 9. Artifact Illustrations.

a. *Frio* type projectile point, 41GL57
b. Concave scraper, 41GL57
c. Partially reduced biface, 41GL57
d. *Scallorn* type projectile point, 41GL91
e. *Castroville* type projectile point, 41GL91

Figure 9

a

b



c

d

e

(1) complete flakes with a complete striking platform and with the distal end and lateral edges intact enough to determine basic flake outline;

(2) platform end flake fragments with a complete striking platform but with breakage at either the distal end or lateral edges;

(3) chips including all thin flake debitage without a complete striking platform (primarily distal and lateral edge flake fragments); and

(4) angular chunks including miscellaneous blocky debitage with no recognizable flaking features.

Totals for these lithic debitage categories by site are provided below. No significant differences between the sites are represented by this data.

	41GL57		41GL91	
Complete flakes	75	33.0%	19	34.5%
Platform end flake fragments	32	14.1%	6	10.9%
Chips	98	43.2%	25	45.5%
Angular chunks	22	9.7%	5	9.1%
	227	100%	55	100%

All complete flakes, platform end flake fragments and chips were further divided into three decortication categories based on the percentage of cortex present on the dorsal surface. These categories are assumed to represent sequential stages in both biface and flake production core reduction.

Totals for the decortication categories summarized below show apparently significant differences in the number and percentages of secondary and interior flakes. These differences are interpreted as resulting from the stages of biface reduction occurring at each site.

	41GL57		41GL91	
Primary	12	5.85%	1	4.00%
Secondary	46	22.40%	7	12.00%
Interior	147	71.70%	42	84.00%
	205	99.95%	55	100%

Ceramics

A single ceramic sherd representing the only ceramics collected in context within Enchanted Rock State Natural Area was recovered from site 41GL57 within the first 10 cm of soil below ground surface. The sherd has a blackened, burnished exterior and bone temper and appears to be similar to specimens of locally-made *Leon Plain* type ceramics described by Assad and Potter (1979).

Bone

One possible bone tool and six unworked fragments were collected; all are from site 41GL91.

The possible tool is a midsection fragment of a deer-sized mammal ulna. Use is indicated by smoothing characteristic of use as an awl. The specimen has been burned.

Although none of the unworked bone fragments collected are identifiable, most appear to be from deer-sized mammals. One specimen may be within the bison-cow-size range. None of the fragments are burned.

Burned Rocks

Gravel- to cobble-sized rocks and rock fragments were recovered from many of the test units. Most were granite or granitic minerals that show little or no

definable differences when thermally altered. Rock was considered burned only if found in context with either a living surface or feature. Most of the material collected out of context, however, is probably related to cultural processes inasmuch as rocks of this size range do not occur naturally within the terrace deposition.

Living surfaces with scattered burned rocks (Fig. 4b) were defined in Test Pits 1 and 2. Most were granite, but a reddish sandstone and quartz were also collected. Size varied from 115x70x66 mm to 45x50x25 mm. A total of seven to eight rocks were recovered from each 1x1-meter 10-centimeter level.

A tight cluster of burned rocks was noted in the bottom of Shovel Probe 2. The cluster appears to be part of a burned rock feature with no recognizable fill; cross section is probably flat rather than basin-shaped.

Prehistoric Artifact Inventories

Provenience of the prehistoric artifacts is given in Tables 9 and 10 for site 41GL57 and Table 11 for site 41GL91.

HISTORIC ARTIFACT DESCRIPTIONS

The major artifact categories recognized for the historic materials from site 41GL91 are summarized in Table 12 following.

TABLE 9

PREHISTORIC ARTIFACT INVENTORY - 41GL57

Description	TP1 L1	TP1 L2	TP1 L3	TP1 L4	TP1 L5	TP1 L6	TP1 L7	TP2 L1	TP2 L2	TP2 L3	TP2 L4
Total Tool/Other	1	0	0	0	0	0	0	0	0	0	0
arrow points (midsection)	1	0	0	0	0	0	0	0	0	0	0
dart points	0	0	0	0	0	0	0	0	0	0	0
partially reduced bifaces	0	0	0	0	0	0	0	0	0	0	0
miscellaneous bifaces	1	0	0	0	0	0	0	0	0	0	0
concave scraper	0	0	0	0	0	0	0	0	0	0	0
utilized-retouched flakes	0	0	0	0	0	0	0	0	0	0	0
Total Lithic Debitage	4	5	4	3	5	6	2	12	7	3	3
complete flakes	1	2	0	1	1	0	1	5	3	2	2
primary	0	1	0	1	0	0	0	1	0	0	0
secondary	0	0	0	0	1	0	0	1	0	1	1
interior	1	1	0	0	0	0	1	3	3	1	1
platform end flake fragments	0	0	2	0	0	1	0	2	4	0	0
primary	0	0	0	0	0	0	0	0	0	0	0
secondary	0	0	0	0	0	0	0	0	0	0	0
interior	0	0	2	0	0	1	0	2	4	0	0
chips	2	2	2	1	4	5	1	3	0	1	1
primary	0	1	0	0	1	0	0	3	0	1	1
secondary	0	1	1	1	0	0	0	1	0	0	0
interior	2	0	1	0	3	5	1	1	0	1	0
angular chunks	1	1	0	1	0	0	0	2	0	0	0
Ceramics, *Leon Plain*	1	0	0	0	0	0	0	0	0	0	0

TABLE 9, Continued

Description	TP3 L1	TP3 L2	TP3 L3	TP4 L1	TP4 L2	TP5 L1	TP5 L2	TP5 L3	TP5 L4
Total Tool/Other	5	0	0	0	0	1	0	0	1
arrow points (midsection)	0	0	0	0	0	0	0	0	0
dart points	1	0	0	0	0	0	0	0	0
partially reduced bifaces	1	0	0	0	0	0	0	0	0
miscellaneous bifaces	1	0	0	0	0	1	0	0	0
concave scraper	1	0	0	0	0	0	0	0	0
utilized/retouched flakes	1	0	0	0	0	0	0	0	1
Total Lithic Debitage	43	20	2	2	6	20	15	14	8
complete flakes	12	8	1	1	2	7	3	5	3
primary	0	0	0	0	0	1	0	1	0
secondary	5	3	1	0	1	2	0	1	1
interior	7	5	0	1	1	4	3	3	2
platform end flake fragments	8	4	0	1	1	0	3	2	0
primary	0	0	0	0	0	0	0	0	0
secondary	2	0	0	0	0	0	2	0	0
interior	6	4	0	1	1	0	1	2	0
chips	17	8	1	0	3	10	6	7	4
primary	1	0	0	0	0	0	0	1	0
secondary	3	2	1	0	1	2	0	0	0
interior	13	6	0	0	2	8	6	6	4
angular chunks	6	0	0	0	0	3	3	0	1
Ceramics, *Leon Plain*	0	0	0	0	0	0	0	0	0

TABLE 10

PREHISTORIC ARTIFACT INVENTORY, SHOVEL PROBES - 41GL57

Description	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12
Total Tools/Other	0	0	0	0	0	0	0	0	1	0	0	0
arrow points (midsection)	0	0	0	0	0	0	0	0	1	0	0	0
dart points	0	0	0	0	0	0	0	0	0	0	0	0
Total Lithic Debitage	3	4	4	0	4	3	5	1	8	6	5	0
complete flakes	0	1	1	0	1	1	3	0	4	2	2	0
primary	0	0	0	0	0	0	0	0	0	0	0	0
secondary	0	0	0	0	0	0	2	0	2	1	1	0
interior	0	1	1	0	1	0	1	0	2	1	1	0
platform end flake fragments	0	2	2	0	0	0	0	0	0	0	0	0
primary	0	0	0	0	0	0	0	0	0	0	0	0
secondary	0	0	1	0	0	0	0	0	0	0	0	0
interior	0	2	1	0	0	0	0	0	0	0	0	0
chips	2	1	0	0	3	2	0	0	0	0	0	0
primary	0	0	0	0	1	1	0	0	0	0	0	0
secondary	0	0	0	0	1	0	0	0	0	1	0	0
interior	2	1	0	0	1	1	2	1	3	2	3	0
angular chunks	1	0	1	0	0	0	0	0	0	1	1	0
Ceramics, *Leon Plain*	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 11

PREHISTORIC ARTIFACT INVENTORY - 41GL91

Description	TP1 L1	TP1 L2	TP1 L3	TP1 L4	TP1 L5	TP1 L6
Total Lithic Tools	0	3	1	0	0	0
arrow points	0	1	0	0	0	0
dart points	0	0	1	0	0	0
miscellaneous bifaces	0	1	0	0	0	0
utilized flakes	0	1	0	0	0	0
Total Lithic Debitage	6	11	15	12	7	4
complete flakes	2	2	5	6	2	2
primary	0	0	0	0	0	0
secondary	0	0	4	1	0	0
interior	2	2	1	5	2	2
platform end flake fragments	1	2	3	0	0	0
primary	0	1	0	0	0	0
secondary	0	0	0	0	0	0
interior	1	1	3	0	0	0
chips	2	3	7	6	5	2
primary	0	0	0	0	0	0
secondary	0	0	0	1	0	1
interior	2	3	7	5	5	1
angular chunks	1	4	0	0	0	0
Bone Awl	0	0	1	0	0	0
Bone	0	2	3	1	0	0

TABLE 12

HISTORIC ARTIFACT CATEGORIES

Category	Totals
Glass	150
Ceramics	17
Metal	17
Miscellaneous artifacts	3

Glass

Most glass recovered was bottle glass with a distinction made between body and rim sherds. Two types of rims are represented: (1) ring and collar, and (2) ring lip. Most bottle glass is selenite bleached with lesser quantities of unbleached and amber, green, blue and pink-colored glass present. The pink glass does not appear to be manganese bleached but was colored during manufacturing.

Other glass categories include pressed glass, milk glass, windowpane and lamp chimney fragments. One lump of glass fused by burning was also collected.

Ceramics

Pearlware, stoneware and porcelain ceramic sherds were collected. The most numerous category, Pearlware, is divided into plain, Decalcomania and Late Transfer Ware types.

Metal

Metal objects are divided into nail and other categories. Most nails collected are wire nails, with only one specimen of a cut nail. Other metal objects

include an iron bolt, a fragment of an iron ring, a crushed metal tube and sheet iron fragments.

Miscellaneous Artifacts

Three artifacts are included in the miscellaneous category: a slate pencil fragment, a plastic tube that is probably a pipestem fragment, and a small piece of what appears to be rubber.

The provenience of historic artifacts is given in Table 13.

PREHISTORIC ARCHEOLOGICAL SUMMARY AND INTERSITE COMPARISONS

Site 41GL57

Although the area of significant cultural resources identified at 41GL57 is limited to on or near the low rise, most areas tested contained evidence of prehistoric occupation.

Two such occupational periods were recognized. The most intensive of the two is the Late Archaic Period use of the low rise area; a much lighter occupation, dating from the Late Prehistoric Period, covers a portion of the terrace surrounding the rise. No evidence of an Early Archaic component (as inferred by Assad and Potter [1979] from a *Nolan* type projectile point) was recovered from the site. Cultural materials collected from the terrace area south of the road (Test Pit 1) below the Late Prehistoric level probably represent debris accumulated from slope washing of Archaic material from higher on the rise.

TABLE 13

HISTORIC ARTIFACT INVENTORY - 41GL91

Description	TP1 L1	TP1 L2	TP1 L3	TP1 L4	Totals
Bottle glass (body sherds)					
unbleached	0	2	3	0	5
selenite bleached	0	32	30	2	73
amber	4	8	7	0	19
green	1	0	0	0	1
blue	1	0	0	0	1
pink	0	0	1	0	1
Bottle glass (rim sherds)					
unbleached ring and collar	0	0	1	0	1
selenite bleached ring lip	1	0	0	0	1
amber ring and collar	0	1	0	0	1
amber ring lip	1	0	0	0	1
Pressed glass (body sherds)					
selenite bleached	0	0	1	0	1
pink	0	1	0	0	1
Pressed glass (rim sherds)					
selenite bleached	1	0	0	0	1
Milk glass (jar)	0	2	0	1	3
Windowpane	10	24	2	0	36
Lamp chimney	0	0	3	0	3
Miscellaneous burned glass	0	1	0	0	1
Ceramics (body sherds)					
plain Pearlware	1	2	2	0	5
Decalcomania	0	3	0	0	3
Late Transfer Ware	0	1	0	0	1
stoneware	0	0	1	0	1
Ceramics (rim sherds)					
plain Pearlware	1	2	3	0	6
porcelain	0	1	0	0	1
Metal (Nails)					
cut	0	0	1	0	1
wire	0	1	5	-	6
unidentified	0	1	0	0	1
Metal (other)					
threaded iron bolt	0	1	0	0	1
iron ring fragment	0	0	1	0	1
crushed tube	0	1	0	0	1
sheet iron	0	1	5	0	6
Miscellaneous					
slate pencil	0	0	1	0	1
plastic tube	0	0	1	0	1
rubber fragment	0	0	1	0	1

The Late Archaic Period occupation is characterized best by data from Test Pits 2 and 3 and Shovel Probes 1 and 2. This area represents a single definable occupation and is used to characterize the site for intersite comparisons.

Site 41GL91

All excavated data collected from 41GL91 is from the terrace area, but the following summary probably applies to the entire site area. As at 41GL57, two occupations are represented, the Late Archaic and Late Prehistoric periods. Unfortunately, there is no separation between the two due to the severe mixing of the deposits at the site.

Intersite Comparisons

Four sites within the Enchanted Rock State Natural Area have been subjected to limited controlled excavations: the two sites investigated by this project and 41LL76 and 41LL254 which were tested by Assad and Potter (1979). Table 14 summarizes the comparable data from these sites and shows differences between sites in both artifact and lithic decortication categories.

These differences are especially clear in comparisons between sites 41GL57 and 41LL76, specifically the lithic debitage versus bone categories, and in the percentages of secondary and interior lithic debitage.

The differences noted appear to be more related to site situation (terrace vs. low granite rise) than to age or cultural affiliation. However, this generalization cannot be conclusively demonstrated with the limited number of sites and data available for comparison.

TABLE 14

INTERSITE COMPARISONS

Site	Age or Cultural Affiliation	Type of Site	Excavated Sample	Primary	Secondary	Interior
41GL57	Late Archaic	low rise; lithic scatter	7.22 1x1 meter 10 cm levels	3.4%	25%	71.6%
41GL91	Mixed Late Archaic and Prehistoric	mixed slope and terrace	4.50 1x1 meter 10 cm levels	4.0%	12%	84.0%
41LL76	Late Prehistoric	terrace	10.00	0.5%	12%	88.0%
41LL254	Predominantly Middle and Early Archaic	terrace	15	1.0%	8%	91.0%

Site	Total Artifacts	Lithic Tools		Lithic Debitage		Ceramics		Grinding Stone		Bone Tools		Bone		Burned Rocks
41GL57	102	5	4.9%	97	95.1%	0	-	noted on site		0	-	0	-	living surface scatter; intact features
41GL91	66	4	6.1%	55	83.3%	0	-	noted on site		1	1.5%	6	9.1%	scattered
41LL76	420*	4	0.95%	269	64.0%	0	-	1	0.24%	0	-	148	35.2%	scattered
41LL254	13371*	115	0.86%	12691	94.9%	0	-	9	0.66%	0	-	556	4.16%	intact features

*inflated by the inclusion of Constant Volume Analysis data.

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APPENDIX: FLAKE ANALYSIS, SITES 41GL57 AND 41GL91

Steven M. Kotter

FLAKE ANALYSIS, SITES 41GL57 AND 41GL91

The complete flakes recovered from sites 41GL57 and 41GL91 were given a more detailed descriptive analysis including:

(1) measurements of flake dimensions and maximum thickness in millimeters using a sliding caliper;

(2) the derived ratio of flake length to width with values below 1.0 representing specimens with width greater than length and values above 1.0 representing length greater than width;

(3) measurements in degrees of the angle formed by the striking platform and the flake's ventral surface (striking angle) using a contact goniometer;

(4) the type of striking platform with distinctions made between prepared, unprepared and crushed platforms; and

(5) the nature of the flake's distal end, either feathered or ending in a roll or step fracture.

The measurements of striking platforms include platform end flake fragments, as well as complete flakes.

In addition, secondary flakes were divided into categories based on the location of the cortex in relation to the striking platform. The recognized categories include:

(1) cortex at striking platform only;

(2) cortex at the flake's proximal end only;

(3) cortex at the flake's distal end only; and

(4) cortex along one lateral edge of the flake.

Only data from site 41GL57 is used in the discussion of complete flake characteristics; the sample recovered from site 41GL91 was too small to give significant results.

Flake Dimensions

Flake dimensions, including length (Fig. 10), width

(Fig. 11), and maximum thickness (Fig. 12) are summarized using bar graphs giving the number of specimens per millimeter measurement.

The graph for flake length shows an elongated battleship curve with the major peak at 11 cm. The range in flake length is from 7 cm to 52 cm with most falling between 7 cm and 29 cm. No secondary peaks are recognized. Flake widths range from 8 cm to 41 cm with the majority between 8 cm and 27 cm. The major peak is at 10 cm with secondary peaks at 21 cm and possibly at 27 cm. The measurements of flake thicknesses show a major peak at 2 mm with a possible minor peak at 5 mm.

The coincidence of flake length and width measurements would appear to represent a random flaking process; that is, one not geared to the specific production of either long slender flakes or short wide flakes. The general thinness of the flakes collected apparently indicates that biface thinning and/or small flake production predominated rather than the production of large thick flakes (for flake tools).

Length to Width Ratio

The ratios of length to width for complete flakes given in Fig. 13 show a series of indistinct and broken peaks. Most of the ratios (72.9%) are clustered between 0.5 and 1.5 with only a few flakes of blade proportions (that are not a result of a blade technology). These data, again, appear to represent a random flaking process.

Flake Striking Angle

The striking angle of the flakes recovered from site 41GL57 are summarized in Figure 14, a bar graph

Figure 10

41 GL 57

FLAKE LENGTH OF COMPLETE FLAKES

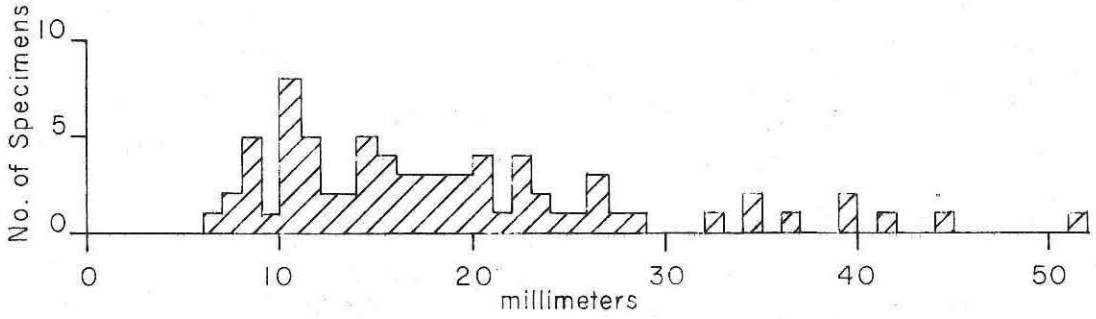
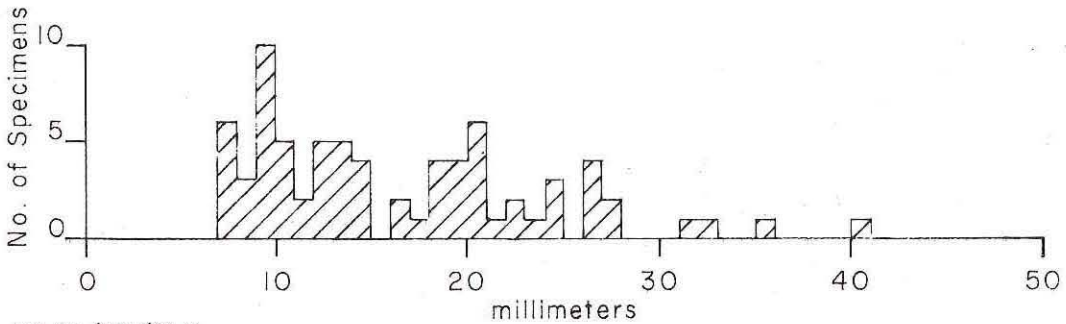


Figure 11

41 GL 57

FLAKE WIDTH OF COMPLETE FLAKES



P&A1/80/SLH

Figure 12

41 GL 57

FLAKE THICKNESS OF COMPLETE FLAKES

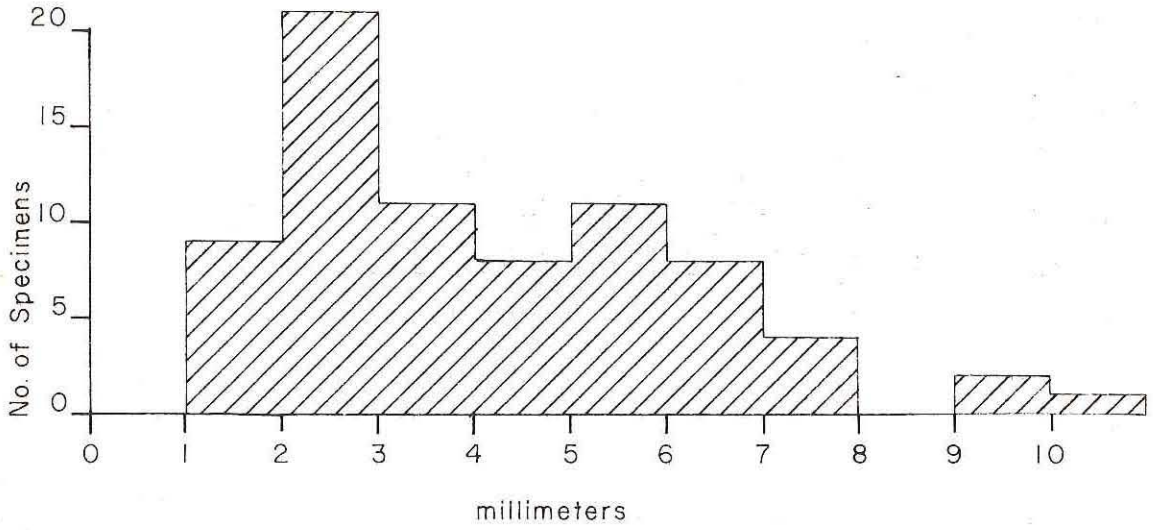
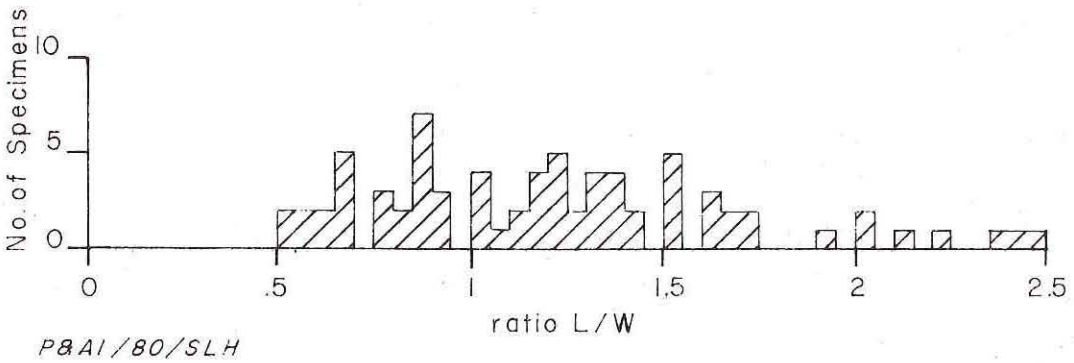


Figure 13

41 GL 91

RATIO OF LENGTH / WIDTH OF COMPLETE FLAKES



P&A1/80/SLH

showing the number of specimens by 10° increments. The graph shows three peaks, the greatest one at 100° and lesser peaks at 120° and 130°.

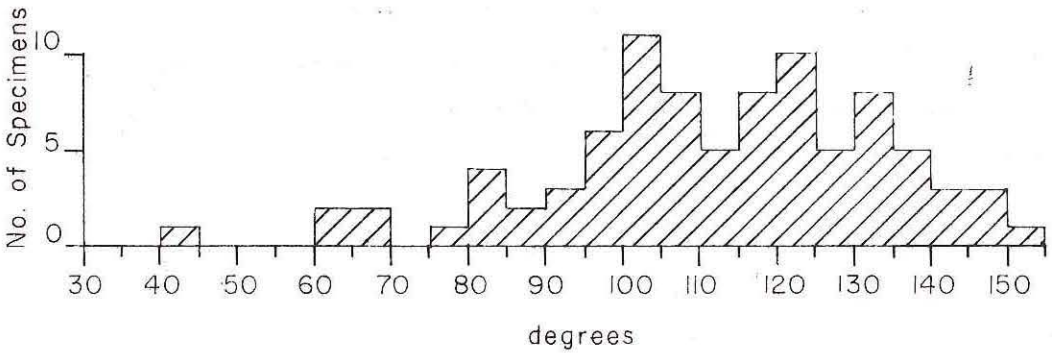
In general, an angle closer to 90° indicates that a flake was removed from a flake production core, whereas a higher angle identifies biface thinning flakes. If this general statement is used to characterize the processes represented by the bar graph, it would appear that both processes were used at the site. Biface thinning, however, as indicated by the peaks at 120° and 130°, may have been the more predominant technique used.

Figure 14

41 GL 57

FLAKE STRIKING ANGLE OF COMPLETE FLAKES &

PLATFORM END FLAKE FRAGMENTS



P&A1/80/SLH

Platform Type

The platform types by flake decortication category are given in Table 15 below. The majority of the flakes in each of the categories have prepared platforms. Cortex flakes, however, include an almost equal number of unprepared platforms while the interior flakes have a significant number of crushed platforms.

TABLE 15

PLATFORM TYPES

Decortication Category	Unprepared	Prepared	Crushed
Primary	2	3	0
Secondary	11	14	3
Interior	0	58	14
	13	75	17
	12.4%	71.4%	16.2%

Six complete flakes, as noted in the comments column of Table 16, exhibit a negative bulb of percussion on the dorsal surface corresponding to the positive bulb on the ventral surface. Although none of the flakes can be classified as sequence flakes as defined in the Trans-Pecos area, these flakes do share some of the characteristics.

Flake Distal Ends

A division of complete flakes into feathered, roll-fractured and step-fractured distal ends may give some indication of flaking efficiency. Most of the distal ends are feathered but the total also includes a significant percentage (20.5%) of roll fractures. Only

one flake has a recognizable step fracture.

Secondary Flakes

The locations of cortex on the complete secondary flakes from site 41GL57 are given below.

At the platform only or platform end	9
At the distal end	8
Along one lateral edge	7

The data shows an almost equal distribution between the three divisions.

The data base for the above discussion of descriptive flake characteristics is provided in Tables 16, 17, 18 and 19.

TABLE 16

COMPLETE FLAKE ANALYSIS - 41GL57

Description	Provenience	Length	Width	Thickness	Ratio - Length to Width	Striking Angle	Platform	Comments
PRIMARY	TP1, L2	16	19	2.5	.84	105°	Unprepared	
	TP1, L4	11	8	4	1.37	110°	Prepared	
	TP2, L1	35	41	10.5	.85	102°	Prepared	
	TP5, L1	27	27	9	1.0	99°	Unprepared	burned; roll fracture
	TP5, L3	21	21	5	1.0	100°	Prepared	
SECONDARY	TP2, L4	20	12	2	1.66	95°	Unprepared	
cortex at	TP3, L1	12	19	5	.63	80°	Unprepared	roll fracture
platform	TP3, L1	20	27	3	.74	115°	Unprepared	
only	TP5, L3	19	9	3	2.1	110°	Unprepared	
	TP5, L4	10	15	2	.66	130°	Unprepared	negative bulb on dorsal surface
	SP6	9	10.5	2	.86	112°	Unprepared	negative bulb on dorsal surface
cortex at	TP2, L1	52	21	6	2.48	100°	Unprepared	possibly utilized
platform end	SP9	17	10	2	1.7	-	Unprepared	
cortex at	TP3, L1	23	19	3	1.21	107°	Prepared	
distal end	TP3, L2	23	20	4	1.15	105°	Prepared	
	TP3, L2	15	10	1.5	1.5	62°	Prepared	roll fracture
	TP3, L3	23	27	5.5	.85	82°	Crushed	negative bulb on dorsal surface; burned
	TP4, L2	23	20	9	1.15	80°	Prepared	
	TP5, L1	40	33	5	1.21	-	Crushed	
	SP7	20	36	5	.55	122°	Prepared	negative bulb on dorsal surface
	SP9	24	23	6	1.04	90°	Prepared	burned; roll fracture

TABLE 16, Continued

Description	Provenience	Length	Width	Thickness	Ratio - Length to Width	Striking Angle	Platform	Comments
SECONDARY cortex lateral	TP1, L5	12	8	1.5	1.5	40°	Crushed	
	TP2, L3	33	25	7	1.32	102°	Prepared	burned; cortex also opposite bulb
	TP3, L1	27	21	6	1.29	125°	Unprepared	negative bulb on dorsal surface
	TP3, L1	17	20	7	.85	82°	Prepared	
	TP3, L2	21	17	7	1.24	130°	Prepared	
	TP5, L1	14	10	2.5	1.4	-	Crushed	
	SP10	29	12	5	2.42	135°	Prepared	
INTERIOR	TP1, L1	8	13	2	.62	75°	Prepared	burned
	TP1, L2	15	15	5	1.0	85°	Prepared	
	TP1, L7	21	27	6	.77	68°	Prepared	burned; roll fracture
	TP2, L1	37	22	3	1.63	140°	Prepared	
	TP2, L1	28	21	4	1.33	115°	Prepared	
	TP2, L2	18	18	5	1.0	115°	Prepared	roll fracture
	TP2, L2	19	14	2	1.36	130°	Prepared	roll fracture
	TP2, L2	15	13	4	1.15	118°	Prepared	
	TP2, L3	21	11	2	1.91	-	Crushed	
	TP2, L4	13	8	1	1.63	130°	Prepared	
	TP3, L1	45	28	4	1.61	135°	Prepared	
	TP3, L1	27	32	6	.84	135°	Prepared	roll fracture
	TP3, L1	16	14	2	1.14	110°	Prepared	
	TP3, L1	11	23	4	.48	127°	Prepared	roll fracture
	TP3, L1	19	24	5	.79	133°	Prepared	step fracture
	TP3, L1	11	15	1.5	.73	-	Crushed	
	TP3, L1	26	13	6	2.0	100°	Prepared	
	TP3, L1	13	9	1	1.44	-	Crushed	

TABLE 16, Continued

Description	Provenience	Length	Width	Thickness	Ratio - Length to Width	Striking Angle	Platform	Comments
INTERIOR	TP3, L2	42	28	5	1.5	115°	Prepared	roll fracture
	TP3, L2	18	20	3	.9	110°	Prepared	roll fracture
	TP3, L2	22	10	3	2.2	115°	Prepared	
	TP3, L2	24	15	2	1.6	120°	Prepared	
	TP3, L2	11	19	2	.58	120°	Prepared	roll fracture
	TP4, L1	15	10	3	1.5	103°	Prepared	
	TP4, L2	11	13	2	.85	-	Crushed	
	TP5, L1	35	21	4	1.66	112°	Prepared	
	TP5, L1	17	13	3	1.31	-	Crushed	negative bulb on dorsal surface
	TP5, L1	12	11	1	1.09	-	Crushed	roll fracture
	TP5, L1	8	10	1.5	.8	92°	Prepared	
	TP5, L2	25	21	4	1.19	-	Crushed	
	TP5, L2	11	8	1	1.38	135°	Prepared	
	TP5, L2	12	8	1	1.5	145°	Prepared	
	TP5, L3	18	14	2.5	1.29	95°	Prepared	
	TP5, L3	9	17	3	.53	65°	Prepared	roll fracture
	TP5, L3	9	10	3	.9	143°	Prepared	
	TP5, L4	11	9	5	1.22	92°	Prepared	
	TP5, L4	16	8	2	2.0	125°	Prepared	
	SP2	40	25	6	1.6	120°	Prepared	
	SP3	11	10	2	1.1	130°	Prepared	
	SP5	7	14	3	.5	123°	Prepared	
	SP7	14	11	2	1.27	-	Crushed	
	SP9	15	11	2.5	1.36	105°	Prepared	
	SP9	9	10	2	.9	130°	Prepared	
	SP10	12	10	2	1.2	125°	Prepared	
	SP11	16	25	6	.64	96°	Prepared	roll fracture

TABLE 17

PLATFORM END FLAKE FRAGMENTS - 41GL57

Description	Provenience	Striking Angle	Platform	Comments
SECONDARY	TP3, L1	-	Prepared	negative bulb on dorsal surface
	TP3, L1	97°	Prepared	
	TP5, L2	100°	Unprepared	burned
	TP5, L2	60°	Prepared	roll fracture
	SP3	125°	Unprepared	burned
INTERIOR	TP1, L3	108°	Prepared	
	TP1, L3	120°	Prepared	
	TP1, L6	145°	Prepared	
	TP2, L1	115°	Prepared	
	TP2, L1	-	Crushed	
	TP2, L2	100°	Prepared	
	TP2, L2	-	Crushed	
	TP2, L2	108°	Prepared	
	TP2, L2	150°	Prepared	
	TP3, L1	107°	Prepared	
	TP3, L1	97°	Prepared	
	TP3, L1	104°	Prepared	
	TP3, L1	130°	Prepared	
	TP3, L1	-	Crushed	
	TP3, L1	-	Crushed	
	TP3, L2	120°	Prepared	
	TP3, L2	135°	Prepared	
	TP3, L2	143°	Prepared	
	TP3, L2	100°	Prepared	
	TP4, L1	87°	Prepared	
	TP4, L2	123°	Prepared	burned
	TP5, L2	124°	Prepared	
	TP5, L3	118°	Prepared	
	TP5, L3	105°	Prepared	
	SP2	-	Crushed	
	SP2	145°	Prepared	
	SP3	-	Crushed	

TABLE 18

COMPLETE FLAKE ANALYSIS - 41GL91

Description	Provenience	Length	Width	Thickness	Ratio-Length to Width	Striking Angle	Platform	Comments
SECONDARY cortex at platform only	TP1, L3	16	17	6	.94	119°	Unprepared	
cortex at	TP1, L3	30	24	5	1.25	-	Crushed	
distal end	TP1, L3	34	28	7	1.21	110°	Prepared	roll fracture
Cortex on	TP1, L3	15.5	16	4	.97	-	Crushed	
lateral edge	TP1, L4	32	55	10	.58	110°	Prepared	
INTERIOR	TP1, L1	11	10	1.5	1.1	128°	Prepared	
	TP1, L1	8	8	3	1.00	95°	Prepared	
	TP1, L2	20	22	7	.91	105°	Prepared	roll fracture
	TP1, L2	8	12	3	.67	102°	Prepared	roll fracture
	TP1, L3	17	16	6	1.06	130°	Prepared	
	TP1, L4	9	18	4	.50	123°	Prepared	
	TP1, L4	35	43	4	.81	113°	Prepared	
	TP1, L4	41	33	7.5	1.24	-	Crushed	roll fracture
	TP1, L4	22	11	2	2.00	110°	Prepared	
	TP1, L4	11	8	1	1.375	-	Crushed	
	TP1, L5	23	44	4	.52	147°	Prepared	
	TP1, L5	12	6	1	2.00	150°	Prepared	
	TP1, L6	21	15	2	1.4	142°	Prepared	
	TP1, L6	12	19	3	.63	-	Crushed	

TABLE 19

PLATFORM END FLAKE FRAGMENTS - 41GL91

Description	Provenience	Striking Angle	Platform	Comments
PRIMARY	TP1, L2	97°	Prepared	burned
INTERIOR	TP1, L1	135°	Prepared	roll fracture
	TP1, L2	110°	Prepared	
	TP1, L3	138°	Prepared	
	TP1, L3	124°	Prepared	
	TP1, L3	-	Crushed	