

LIMITED TEST EXCAVATIONS
AT LA 104720 ALONG NM 26
IN LUNA COUNTY, NEW MEXICO

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MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES
ARCHAEOLOGY NOTES NO. 175

1997

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ARCHAEOLOGY NOTES 175

ADMINISTRATIVE SUMMARY

Between October 17 and 21, 1994, the Office of Archaeological Studies conducted limited test excavations at LA 104720, a large resource extraction and camp site located on Bureau of Land Management property along NM 26. Limited test excavations determined the site limits and artifact distribution, located and flagged all cultural material within the right-of-way, analyzed and collected a sample of the lithic debitage from all but the densest artifact concentration, gridded and collected material from the densest artifact concentration, hand excavated six 1-by-1-m test pits and 29 auger tests, and prepared a map of the site.

LA 104720 is largely deflated with the majority of the artifacts occurring on the surface. Sparse subsurface remains were found in the test pits. While the research potential for surface artifacts and features within the highway right-of-way has been exhausted, the presence of subsurface artifacts and the size of the area involved suggest that the area along the fence should be protected by fencing during highway construction activities.

BLM Permit No. 21-2920-94-Q
NMSHTD Project No. SP-ON-1(205) CN 2524 D 05486
MNM Project No. 41.588

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INTRODUCTION

The New Mexico State Highway and Transportation Department (NMSHTD) plans to expand the NM 26 driving lanes to 3.65 m (12 ft) with 2.4 m (8 ft) shoulders. A survey conducted by NMSHTD (Evans 1994) located LA 104720, which covers an area of approximately 59,400 sq m on both sides of the highway (Fig. 1) and could be impacted by highway construction. Appendix 2 gives the legal description of the site location.

Limited archaeological testing of LA 104720 was carried out at the request of Mr. William L. Taylor of the Environmental Section, NMSHTD. Fieldwork was conducted between October 17 and 21, 1994. Nancy Akins directed the fieldwork, assisted by Heather Bixler, Lewis Kimmelman, and Raul Troxler. Yvonne Oakes served as principal investigator. Lewis Kimmelman performed the field and laboratory lithic analysis, Marcy Snow and Nancy Akins the ground stone analyses, and Raul Troxler mapped the site and prepared the field map.

LA 104720 is a large (180-by-330 m) lithic artifact, ground stone, and fire-cracked rock scatter. Artifacts are widely dispersed even within the densest portion of the site. Ground stone was invariably small pieces fragmented by fire, and the single feature located, a deflated hearth, was largely comprised of a heat-shattered metate. The only datable projectile point indicates Chiricahua phase Archaic use of the site area.

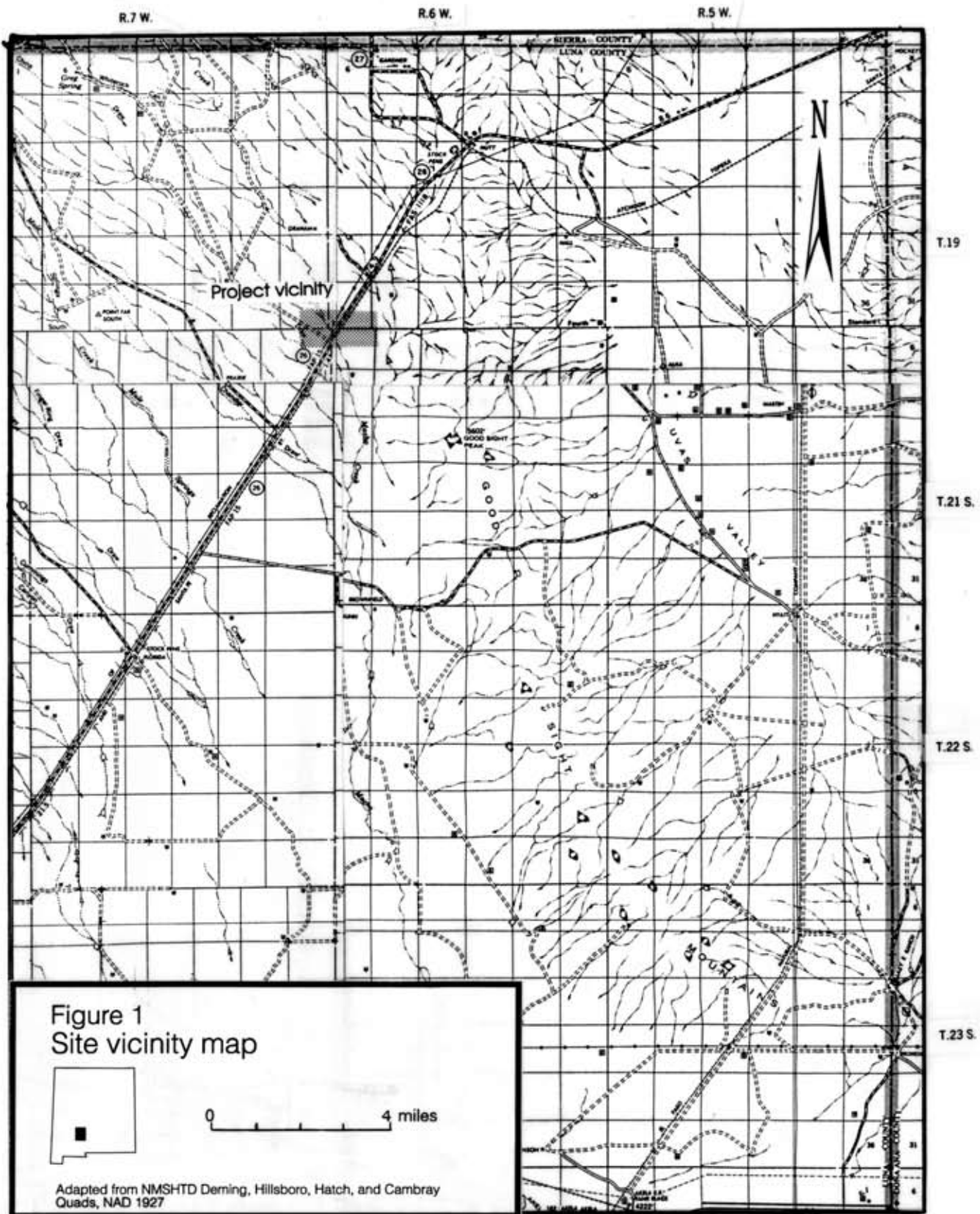


Figure 1
Site vicinity map



0 4 miles

Adapted from NMSHTD Deming, Hillsboro, Hatch, and Cambray Quads, NAD 1927

ENVIRONMENTAL SETTING

LA 104720 is located within the Mexican Highlands section of the Basin-and-Range Plateau physiographic division. This division is mainly isolated north-south trending mountain ranges separated by internally drained structural basins (Fenneman 1931:326, 382-383; Gile et al. 1981). The site is less than 0.5 km west of the Good Sight Mountains in a flat grassy area.

The Good Sight Mountains are composed of rock of the Rubio Peak formation which is dominated by tuffs and breccias, but also includes andesite and latite flows, dikes and plugs, and small amounts of tuffaceous sandstones and conglomerates (Clemons 1979:8). Quaternary alluvial deposits with sporadic zones of calcite occupy the basin floors (Clemons 1979:20).

Soils at LA 104720 are of the Mimbres-Verhaler association. These are deep, moderate to fine textured, nearly level soils on alluvial fans and valley fill sediments. Well-drained silty clay loams support short and mid-sized grasses and mesquite. Soils are either a light brownish gray silty clay loam with a subsoil of pale-brown silty clay loam and pale brown sandy clay loam that contains some lime accumulation in the upper parts (Mimbres) or brown silty clay loam over reddish brown and pinkish gray clay and silty clay (Verhaler) (Neher and Buchanan 1980:4, 21, 23).

The climate of Luna County is semiarid (Tuan et al. 1969) or arid continental (Neher and Buchanan 1980). Seasons are distinct with a wide range of annual temperatures. Moderate amounts of precipitation fall in July, August, and September as thunderstorms with light showers and snow during winter. Evaporation rates are high because of low humidity and high temperatures (Neher and Buchanan 1980).

At Deming, the closest long-term weather station, the minimum temperature averages 6.6 degrees C and the maximum temperature 24.7 degrees C. Precipitation falls mainly in summer from June to August in the form of thunderstorms. Between 1899 and 1986 precipitation averaged 23.5 cm, with a low of 7.0 cm recorded in 1956 and a high of 55.9 cm in 1986. Snow fall averages 7.4 to 12.7 cm. Winds are predominantly from the west and are lightest in the fall and strongest in the spring. Spring winds are from the southwest and dust storms can be hazardous. In late summer and early fall, winds from the southeast bring moist air from the Gulf of Mexico and Pacific Ocean (Mueller 1988:28-29).

Prehistoric Environment

Human subsistence and settlement patterns are greatly influenced by changes in climate and vegetation. In southern New Mexico, the Late Wisconsin (18,000-14,000 B.P.) was characterized by mixed conifer forests and cooler, wetter conditions. Precipitation fell predominantly in winter and summers were cool with low rainfall. During the Early Holocene (14,000-8,000 B.P.), conifer forests were replaced by juniper-oak woodlands and eventually the woodlands became desert grasslands. Temperatures were cool with increasingly warmer summers and precipitation shifted from winter to summer dominant. Middle Holocene (8,000-4,000 B.P.) vegetation continued the shift to desert or grassland with declines in juniper and increases in

mesquite, prickly pear, and other xeric species. Summers were warm and monsoons provided much of the annual precipitation. Winter precipitation was low and temperatures cold. The Late Holocene (4,000 B.P. to present) continued to be xeric. Desert grasslands occurred at higher elevations and desert-scrub at lower elevations. Precipitation was biseasonal; winter rains shifted slightly and irregular drought periods occurred in all seasons (Browning et al. 1991:14).

BACKGROUND

Cultural History

Evidence for Paleoindian (10,000-7000 B.C.) use of southwestern New Mexico consists of isolated projectile points or sites in lower desert settings. Upland erosion may have obscured much of the Paleoindian record as none have been reported for the more thoroughly studied areas, generally in mountain and mountain-transition zones (Lekson 1992:8).

The mobile hunting and gathering adaptation of the Archaic is better known. In the southwestern portion of the state, the Archaic is considered to represent the Cochise Tradition, which is usually divided into the Sulphur Springs phase (7000 to 3500 B.C.), the Chiricahua phase (3500 to 1500 B.C.), and the San Pedro phase (1500 to 200 B.C.) (e.g., Irwin-Williams 1979:37-38; Schutt 1994:14). These phases undoubtedly reflect responses to climatic and vegetative changes. As the economically productive piñon and juniper woodlands disappeared during the Middle Holocene, groups in southern New Mexico relied more on xeric species that are highly dispersed yet available throughout most of the year. This reliance would favor a foraging strategy focused on riverine areas during the winter and dispersal and greater mobility during summer and fall (Wills 1988:55-57).

The adoption of cultigens in the highland Mogollon area may have come about when population density increased to where the annual movement of groups became geographically constrained. Under these conditions, dispatching small groups into the highlands to grow cultigens and to monitor those areas for the more productive fall resources became a viable option (Wills 1988:147-148).

Situated on the edge of the Mimbres Basin, the Mogollon-Mimbres cultural sequence applies to the LA 104720 area. This sequence is commonly divided into three periods: the Early Pithouse (A.D. 200 to 550), Late Pithouse (A.D. 550 to 1000), and Pueblo (A.D. 1000 to 1150) with a variety of phases attributed to each period (Lekson 1992:10-19).

In the Mimbres area, Early Pithouse period settlements are located on high mesas away from the valley bottom. Structures were shallow, round to oval pithouses. Ceramic types include plain brown wares with small amounts of red ware. Agriculture probably was less important with hunting and gathering contributing much to the subsistence round (Lekson 1992:10, 13).

During the Late Pithouse period structures became deeper and more formalized and villages are located on terraces above major drainages. Ceramics are slipped or decorated. Population increased from the Early Pithouse period, and pithouse villages are often hidden beneath Mimbres Pueblos. The focus on major drainages suggests that agriculture had assumed a greater importance (Lekson 1992:13-15).

Pueblo period sites are transitional or have pueblo architecture. Large pueblo sites often began as groups of small, four to five room units that grew into pueblos with hundreds of rooms. In the Mimbres Valley, the population was aggregated into a few large sites. Smaller sites may represent seasonally used fieldhouses. Settlement appears to have spread from the valley into secondary drainages and upland settings suitable for rainfall farming. The Mimbres culture inexplicably collapsed about A.D. 1150 (Lekson 1992:15-19).

Between A.D. 1180 and 1450 two phases are defined, the Black Mountain and Cliff phases. The Black Mountain phase is the local expression of the Casas Grandes system in northern Chihuahua. Pueblos were fewer in number than in the previous period and built of adobe rather than masonry. Pottery assemblages include a number of new types. The Cliff phase was even smaller in extent. Pueblos were still built of adobe but the ceramic assemblage changed to one dominated by Salado polychromes. There is little evidence for occupation of the area from A.D. 1400 until Apache groups arrived (Lekson 1992:19-21).

Prefield Research

Before the excavations were conducted, records at the Archeological Records Management Section (ARMS) and the BLM district office in Las Cruces were searched for information on sites in the vicinity. This search found only one other site recorded within a mile of LA 104720. LA 51768 is 0.5 km to the north and is described as an extensive artifact scatter located on rolling grasslands near a broad, shallow drainage. It is comprised of hundreds of lithic and ground stone artifacts including a Late Archaic projectile point fragment, one-hand manos, slab or basin metates, and fire-cracked rock. Lithic materials include rhyolite, chalcedony, chert, and obsidian (Laumbach et al. 1985; New Mexico Cultural Resource Information System [NMCRIS] form).

Also in the general vicinity are LA 44040, 3.8 km north northeast of LA 104720, and LA 44041, 4.1 km northeast of LA 104720. LA 44040 is described as a lithic reduction station comprised of about 150 primary and secondary decortication flakes on a low rise. LA 44041 is a lithic reduction and possible plant-processing station. It is located on a plain in the valley bottom and is comprised of over 100 primary and secondary decortication flakes, a scraper, and two pieces of ground stone (Baker and Coffelt 1983; NMCRIS forms).

Also to the northeast (5.8 km) is an extensive lithic quarry, LA 37524. The quarry occupies a series of ridges capped with lag gravels that are the source of the lithic raw materials. Materials in a sample analyzed from the site are primarily cherts and rhyolite, and largely angular debris, cores, and tested cobbles with few flake types. This suggests tool manufacture (Akins 1985:18-31). None of these sites are listed in the *State Register of Cultural Properties* or the *National Register of Historic Places*.

LIMITED TESTING

LA 104720 is a large, dispersed scatter of lithic and ground stone artifacts and fire-cracked rock. It is on both sides of NM 26, and visible primarily along and beyond the right-of-way fences. Highway construction has removed surface deposits from the remainder of the right-of-way (Fig.2). The area is mostly flat except for recent contours associated with the highway, which is elevated in this area. Beyond the right-of-way fence, the site is more intact (Fig. 3) but areas have been over-grazed. Artifacts occur mainly in bare areas along with surface gravel.

The site is situated on a flat plain approximately 0.25 km from the base of Good Sight Mountains and covered by grasses and occasional desert shrubs (Fig. 4). Sparse juniper occurs on the Good Sight Mountains. Grasses recognized during the fall include foxtail, gramma, and cane beardgrass with stands of Indian grass adjacent to the roadway. Snakeweed, ephedra, mesquite, and Russian thistle are also present. The nearest water source is Macho Creek, an intermittent stream 3.3 km to the west. In the general area, drainages are small and unnamed. Stock ponds occur along these drainages indicating some accumulation is possible and that seasonal ponding may have provided water for prehistoric populations.

Running northwest to southeast and through the site is the lowest portion of the valley. Grasses in this shallow, broad area are somewhat denser and larger suggesting the site was located to take advantage of this vegetation or the animals that inhabited it. The lack of a nearby permanent or even intermittent water source suggests that the time spent at the location was short.

Methods

Testing methods followed procedures outlined in the *Testing and Site Evaluation Proposal* (OAS 1994) approved by the New Mexico State Historic Preservation Office. Cultural material within the right-of-way was flagged to locate artifacts for field analysis and to mark densities in order to define the site area and to determine placement of test pits. Approximately half of the artifact assemblage within the right-of-way was analyzed in the field. Formal tools, ground stone, lithic artifacts from the densest portion of the scatter, and a sample of the other lithic artifacts were collected and analyzed in the laboratory. Artifacts outside the collection grid were plotted with respect to subdatums on either side of the highway using a transit and stadia rod. Those within the collection grid were collected in 2-by-2-m units.

Test pits were placed in areas of higher artifact densities or near fire-cracked rock concentrations. Levels in the 1-by-1-m units were excavated in arbitrary 10-cm levels. Excavation continued until sterile was reached, that is, 10 cm below the level where artifacts were last recovered. All fill was screened through ¼-inch mesh and the artifacts bagged by horizontal and vertical provenience units. Excavation unit forms were completed for each level of fill, and one of the test pit faces was profiled upon completion of the unit. Pits were immediately backfilled. Six test pits were completed, two on the west side of the highway and four on the east side.

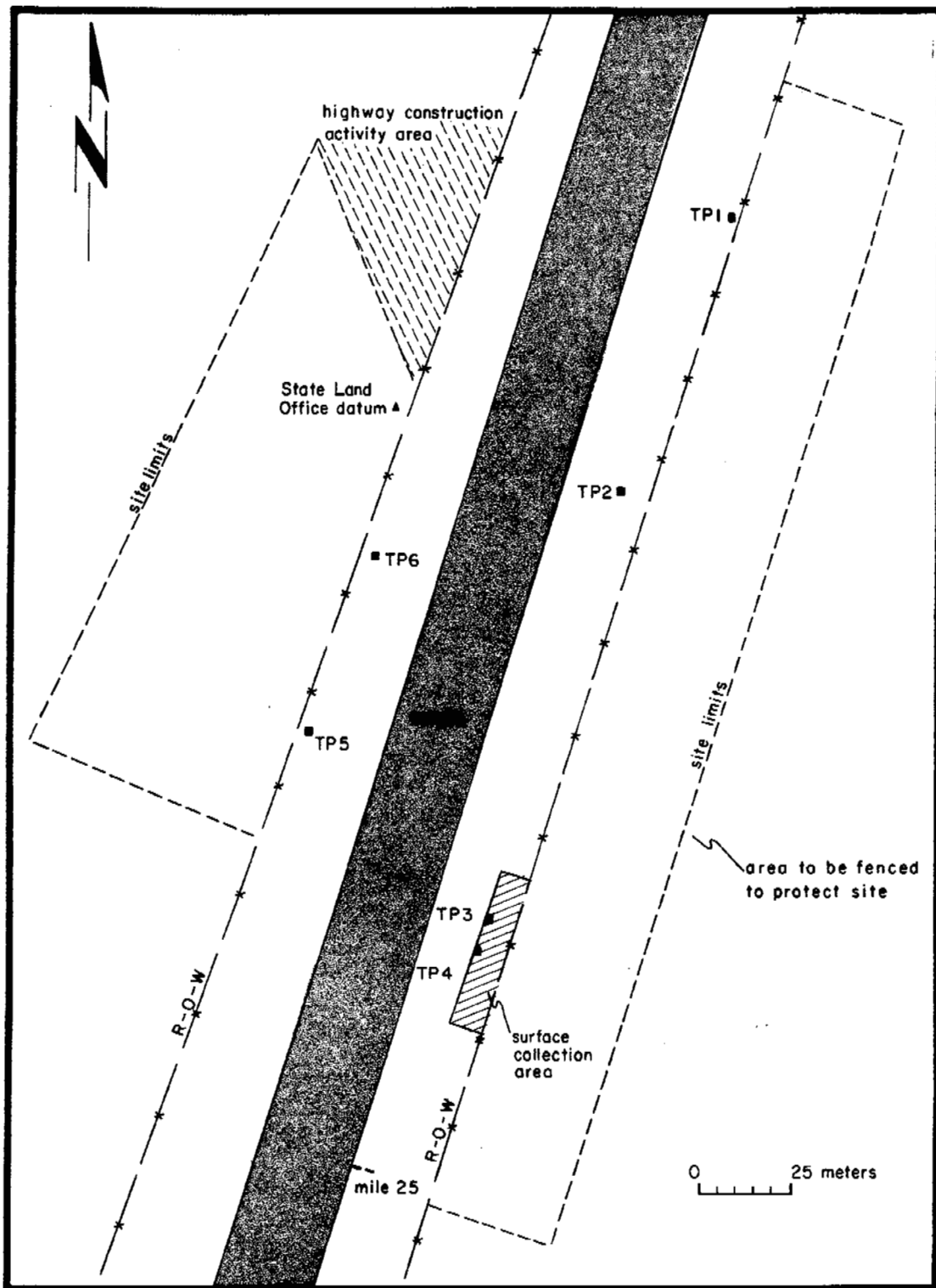


Figure 2. Plan of LA 104720.

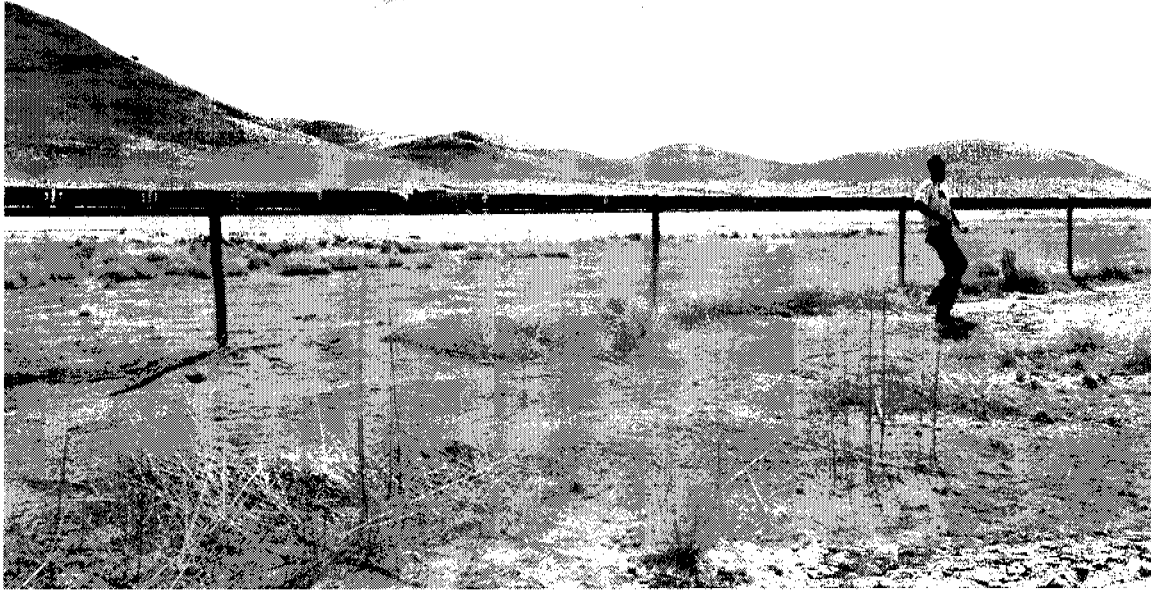


Figure 3. LA 104720, looking north from west of NM 26.



Figure 4. LA 104720, view east to the Good Sight Mountains.

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In addition to the test pits, auger tests were systematically placed along the fence lines and in the bottoms of five of the test pits. On the east side of the highway, these were placed 10 m apart and generally 2 m from the right-of-way fence. Areas with depressions or fire-cracked rock up to 9 m from the fence were also tested. On the west side of the highway, where artifacts were less dense, the distance between tests ranged from 10 m in the north to 25 m at the south end of the scatter. Auger fill was screened through ¼-inch mesh and holes were immediately backfilled.

Site boundaries and modern features were mapped using a transit and stadia rod. Artifact densities determined the extent of the site, although a dispersed scatter extended far beyond the boundaries defined. Subdatum mapping stations (SD 1 and SD 2) were established on either side of NM 26. These were tied into a permanent U.S. General Land Office Datum just beyond the fence on the west side of the highway. This served as the main site datum. All below datum (bd) measurements refer to the depth below (or above) this permanent marker.

Test Pit Results

Test Pits 1 through 4 were located east of NM 26. Test Pits 5 through 6 were west of NM 26.

Test Pit 1

Test Pit 1 was placed over an area that had a mano fragment, a fire-cracked ground stone fragment, and a lithic artifact on the surface. No other cultural material was recovered in three levels of fill (24.5-54.5 cm bd). Fill in the test pit was essentially one layer. The upper 6 cm was loose but otherwise the same as the fill that extended to approximately 40 cm below the present ground surface. It was hard packed, clumpy in texture, dark brown clay loam (7.5YR 3/2 moist, 10YR 4/3 dry) with sparse gravel and white flecks--probably calcium carbonate. Two auger tests (0.8 and 1.0 m deep) at the base encountered a loosely compacted clay loam (10YR 4/3) with small angular and rounded gravels (10 to 20 percent) of mostly igneous rock and coated with calcium carbonate. This extended from approximately 40 to 68 cm below the present ground surface. Beneath this and extending at least another 10 cm was a pale brown loose sandy loam (10YR 6/3). Layers 2 and 3 may be colluvial stream bed deposits.

No charcoal was observed in the excavations or profiles. Minor insect burrowing and decayed plant tubers were noted throughout.

Test Pit 2

Test Pit 2 was placed 50 cm south of Feature 1, a deflated hearth. The surface of the grid was covered with fine ant hill gravel and it sloped to the west. Three levels of fill were removed from this unit (40-70 cm bd). Level 1 contained two pieces of fire-cracked ground stone, possibly from Feature 1. A small C¹⁴ sample was collected from beneath the ground stone. No other definite cultural material was recovered. A small piece of rounded and weathered bone that was probably transported in an insect burrow was recovered from the top of Level 3.

The upper fill was 4 cm of loose eolian-alluvial soil. It was a smooth textured soft sandy clay and grayish brown (10YR 5/2) in color. Beneath this was up to 28 cm of hard packed, clumpy, dark brown (10YR 4/3) clay loam. Sparse (about 5 percent) rounded gravels 1 to 3 cm in size occur throughout. Charcoal was concentrated under the ground stone fragments. Chunks of a white precipitate (calcium carbonate?) up to 2 cm in size were scattered throughout and may have formed inside insect burrows. The final layer of fill was a yellowish brown (10YR 5/4) softer silty clay loam. Its texture was smooth and it had moderate amounts of gravel, generally less than 1 cm in size, but ranging up to 5 cm.

Test Pit 3

Test Pit 3 was placed within a fire-cracked rock scatter in the collection area (68.5-98.5 bd). Two pieces of fire-cracked ground stone were collected from the surface. Lithic artifacts (n = 7) and fire-cracked rock (n = 3) were present in the first level of fill. No cultural material was found in the second and third levels excavated.

The upper fill was 6 to 10 cm of loose dark yellowish brown (10YR 3/4) sandy loam. A single fleck of charcoal was observed in the profile. Beneath this was 22 to 26 cm of clumpy dark grayish brown (10YR 4/2) to brown-dark brown (10YR 4/3) compact sandy clay. A third layer, encountered in the auger test at the base of the test pit and extending at least 44 cm below the pit bottom, was pale brown (10YR 6/3) clean silt.

Test Pit 4

This test pit was placed 20 cm south of Auger Hole 20, which produced a lithic artifact at about 20 cm below the surface. Four levels were excavated (14-54 cm bd). The first level of fill produced a lithic artifact, two pieces of fire-cracked rock, and a small piece of charcoal. Three lithic artifacts were recovered in the second level and one in the third. The fourth level was sterile.

The upper 4 to 8 cm of fill was brown to dark brown (10YR 4/3) loose eolian or alluvial clay loam. Beneath this and extending to 50 cm below the present ground surface was hard yellowish brown (10YR 5/4) clay loam. Fill became less clumpy near the base. In this layer were charcoal flecks, insect burrows, gravel (less than 2 percent), and sparse white flecks. The charcoal diminished with depth and appeared washed rather than occurring in chunks. The auger test at the base indicated that the fill became sandier with more gravel 40 to 50 cm below the pit bottom and fine silt appeared between 50 and 115 cm below the pit bottom.

Test Pit 5

Test Pit 5 was located near a cluster of artifacts. Three levels were excavated (11.5-41.5 cm bd). None produced artifacts.

The upper 2 to 8 cm of fill was loose grayish brown (10YR 5/2) silty clay loam. This overlies at least 20 cm of compact to very compact reddish brown (5YR 3/3) silty clay loam. Fill recovered from the auger test at the base of the pit, and extending from 4 to 162 cm below the base of the pit, was loose brown (10YR 5/3) fine silt.

Test Pit 6

Test Pit 6 was placed at the south end of a fire-cracked rock and lithic cluster. Scattered gravel but no artifacts was present on the surface. No artifacts were found in the first and third levels of fill. A single lithic artifact was recovered from Level 2. No charcoal or fire-cracked rock was noted during the excavation.

Loose grayish brown (10YR 5/2) eolian or alluvial fine clay (2 to 4 cm) formed the first layer of fill. Beneath this was 10 to 14 cm of moderately compact, clumpy brown to dark brown (10YR 5/3 to 4/3) clay loam with small white inclusions. Small pockets of gravel occurred at the intersection with Layer 3. Layer 3 contained about 26 cm of harder dark brown (10YR 4/3) clay loam with increased amounts of white precipitates in tiny flecks. A single fleck of charcoal was observed in the profile. Beneath this, as seen in the auger hole, was at least 28 cm of pinkish (10YR 6/3 to 5/3) silty clay.

Feature

The only feature located at the site was a deflated hearth (Feature 1). The remaining scatter of rock was roughly circular, measuring 140 cm east-west and 150 cm north-south (Fig. 5). The scatter is predominantly igneous fire-cracked rock, much of which is a metate that has been fragmented by heat. An auger test placed at the center of the scatter indicates that none of the original fill remains. Fire-cracked spalls were recovered from the first level of auger fill. Fill was loose eolian with bits of charcoal as far down as 25 cm below the surface, probably transported by insects or other bioturbation.

Auger Tests

A total of 29 auger holes tested for buried cultural deposits, features, or artifacts (Table 1). A single lithic was found in Auger Hole 20 and charcoal was present in those from the center of and near Feature 1 (Auger Holes 10 and 11). Otherwise, the fill was remarkably similar throughout the site area. Excavation continued until the auger was stopped by gravel or the silty-gravely colluvial layer was reached.

Collection Grid

An area 8 by 50 m was gridded in 2-by-2-m units and surface lithic and ground stone artifacts collected. The presence of fire-cracked rock was noted. Appendix 1 gives the artifact and fire-cracked rock counts by grid.

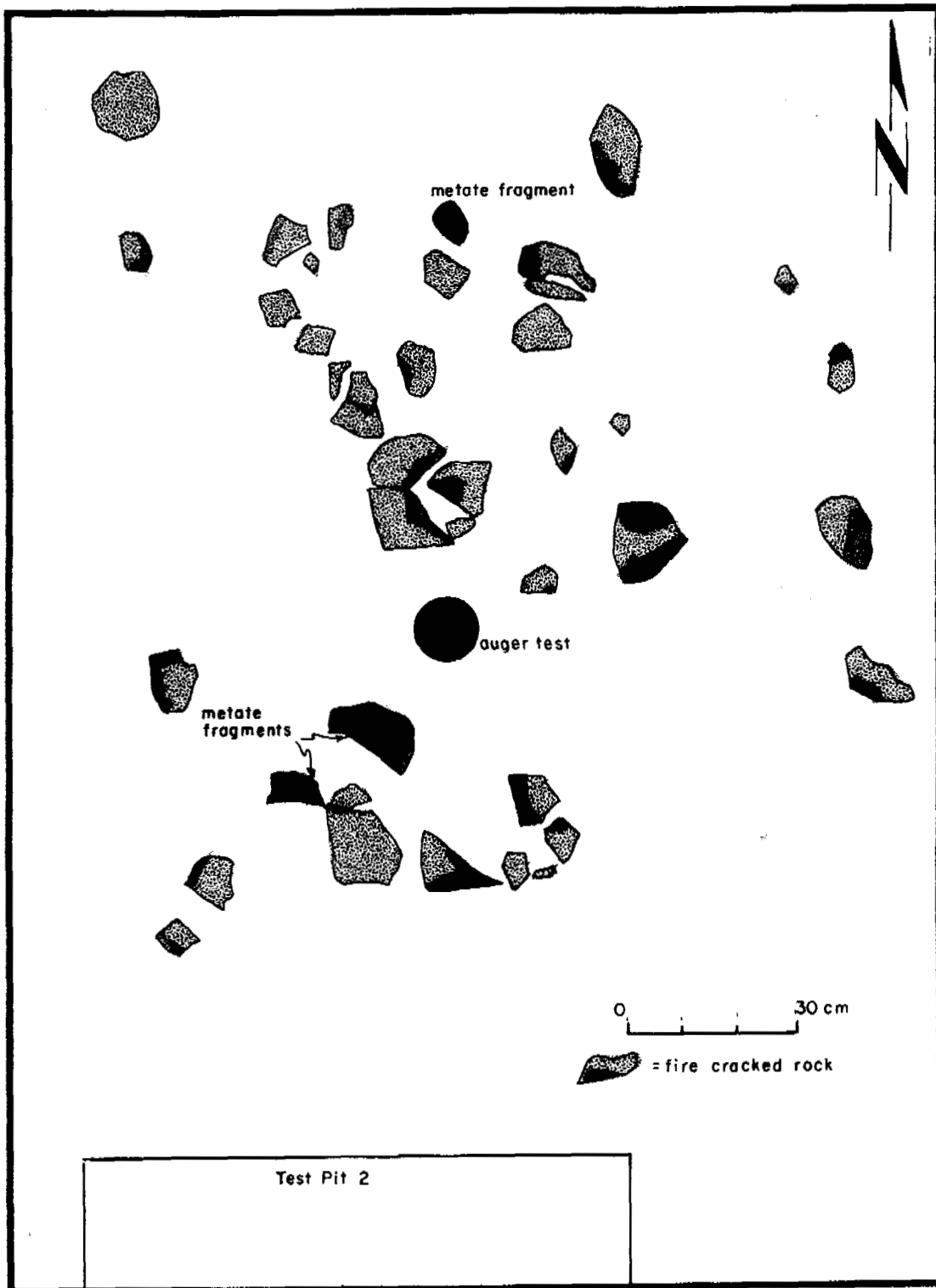


Figure 5. Plan of Feature 1.

Table 1. Auger Test Information (depths below pgs in cm)

Hole No.	Surface bd	Loose Fill	Hard Packed Clay Loam	Silty or Gravel/ Colluvium	Comments
1		0-25	25-55	55-68	
2	33.5	0-30	30-75	75	
3	39.5	0-15	15-40	40-65	
4	49.5	0-15	15-40	50-65	
5	44.5	0-15	15-35	35-55	
6	47.5	0-15	15-47	47-60	
7	47.5	0-22	22-34	34-36	
8	47.5	0-15	15-40	40-52	
9	35.0	0-15	15-30	30-40	
10	30.0	0-20	20-45	45	Feature 1; fcr at 10cm, charcoal to base
11	23.0	0-25	25-40	40	Some charcoal; probably wash from Feature 1
12	29.5	0-15	15-40	40	
13	50.0	0-15	15-35	35-40	
14	49.0	0-15	15-30	30-58	48-58 cm silty contains lumps of clay and possible organic material, may be from insect burrows
15	12.5	0-20	20-38	38-60	
16	11.5	0-25	25-43	43-100	
17	9.0	0-22	22-40	40-45	
18	12.5	0-20	20-40*	40-60	*less compact than most
19	15.5	0-18	18-38	38-50	
20	13.5	0-16	16-38	38-50	lithic at 20 cm
21	7.0	0-14	14-53	53-55	
22	2.5	0-18	18-35	35-55	
23	10.0	0-21	21-52	52-62	
24	8.0	0-12	13-38	38-63	
25	+7.0	0-20	20-34	34-54	
26	+1.0	0-10	10-50	50	
27	+2.0	0-10	10-43	43-56	

Hole No.	Surface bd	Loose Fill	Hard Packed Clay Loam	Silty or Gravel/ Colluvium	Comments
28	18.0	0-10	10-30	30	
29	25.0	0-30	30-70†	70	semicompact and silty; few gravels

ARTIFACT ANALYSES

Lithic Artifacts

Lithic artifacts were analyzed at one of two levels of analysis. The analyses are based the Office of Archaeological Studies standardized methods (1990) designed to examine material selection, reduction technology, and tool use. Variables recorded in the laboratory analysis include: the material type, material quality, texture, artifact morphology, artifact function, percent of cortex, cortex type, portion of the artifact present, platform type, thermal alteration, wear patterns, edge angle for tools, length, width, and thickness. Field analysis variables included all of the above except for material quality, cortex type, wear patterns, and edge angle. Artifacts collected for laboratory analysis included formal tools, lithic artifacts from the collection grid, and a sample of the debitage from outside the collection grid.

Chert is the predominant material type, followed by chalcedony, rhyolitic chert, and rhyolite (Table 2). These materials tend to be fine to medium grained and are those most used for unifaces and bifaces. Waxy texture, indicative of heat treatment was recorded for chert (11.8 percent) and chalcedony (44.4 percent). Potlids ($n = 21$), crazing ($n = 15$), color change ($n = 1$), and charring ($n = 1$) also occurred, presumably from heat treatment. Cortex was generally absent (76.3 percent) but otherwise ranged from small amounts (13.1 percent had from 10 to 30 percent; 4.4 percent had 40 to 60 percent; and 2.9 percent had 70 to 90 percent) to complete dorsal cortex (3.3 percent). Waterworn describes most of the cortex noted (24 of 29 instances). Waxy luster, indicative of heat treatment, was noted for chert (11.9 percent) and chalcedony (44.4 percent).

Core flakes are the predominant debitage type. Biface flakes are well represented indicating bifaces were reduced at this location. Debitage attributes are given in Table 3. Most platforms are collapsed, absent, or obscured (51.4 percent). Biface flakes tend to have retouched and abraded platforms while core flakes have a variety of combinations. Utilization is fairly common (11.7 percent) and retouch rare (1.6 percent). Wear on flakes was predominantly bidirectional (13 core flakes and 5 biface flakes) followed by unidirectional (8 core flakes and 2 biface flakes) with single incidences of bidirectional retouch, bidirectional retouch and battering, unidirectional retouch and bidirectional wear, and unidirectional retouch and abrasion, all on core flakes.

Dimensions of complete artifacts are found in Table 4. Table 5 gives the dimensions for core flakes and biface flakes by material type. Chalcedony flakes of both types tend to be smaller than chert in all but the biface flake thickness.

Cores are most often multidirectional ($n = 7$); fewer are unidirectional ($n = 1$), and bidirectional ($n = 2$). One bidirectional core (Fig. 6a) and one multidirectional core were utilized.

Cobble tools (Fig. 6b-c) include two hammerstones, a chopper (FS 106), and a core chopper (FS 78). Unifaces (Fig. 6d-g) are undifferentiated ($n = 1$), early stage ($n = 2$), and a scraper (FS 8). Bifaces (Fig. 6h-l) are undifferentiated ($n = 2$), early stage ($n = 4$), middle stage ($n = 1$), an unidentified projectile point midsection that could be either side or corner notched, and a Chiricahua point.

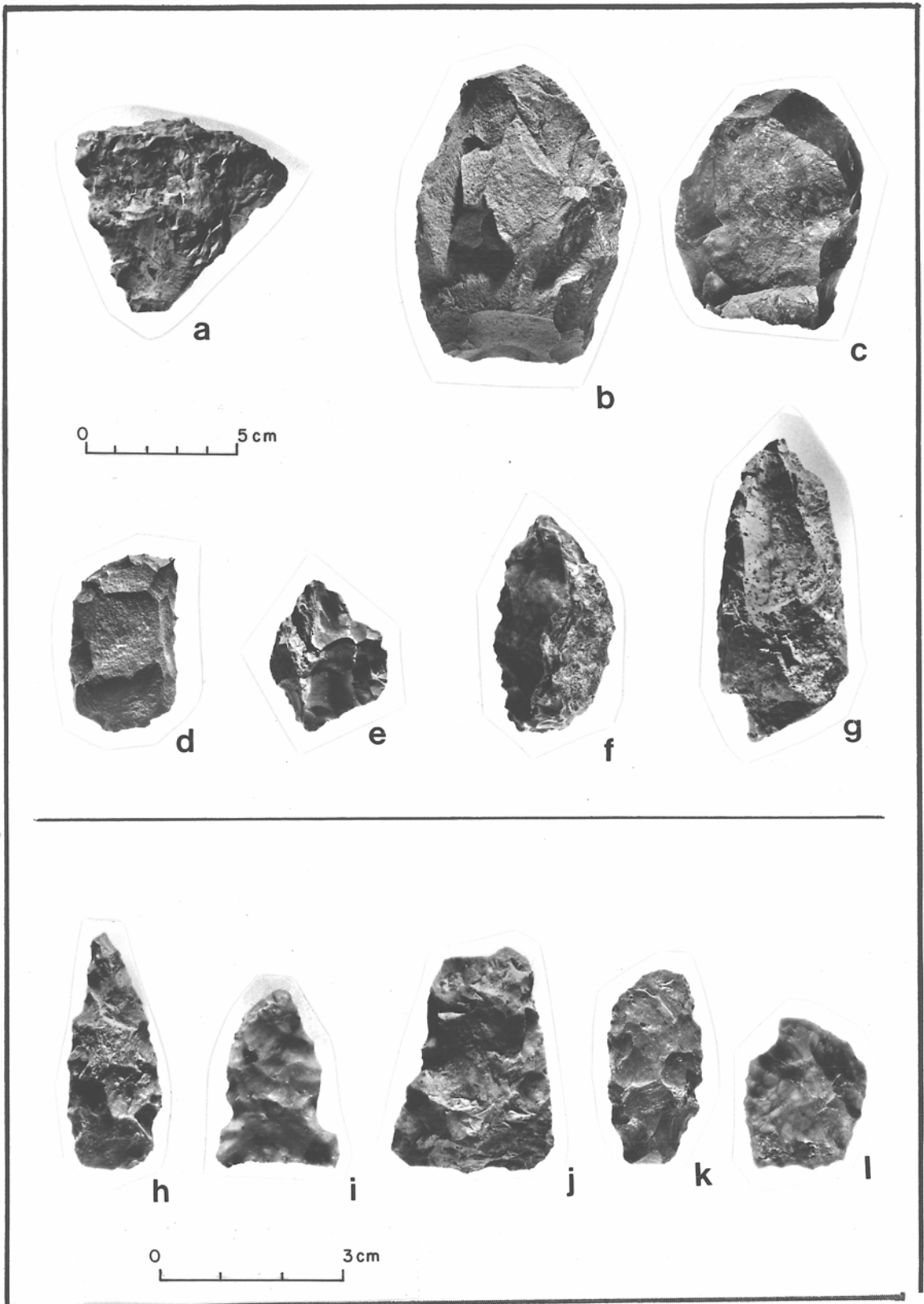


Figure 6. Lithic tool assemblage: (a) bidirectional core, FS 100; (b-c) choppers, FS 78 and FS 106; (d-g) unifaces, FS 8, FS 11, FS 83, FS 94; (h-l) bifaces, FS 59, FS 60, FS 61, FS 64, FS 86.

Table 2. Artifact Morphology by Material Type Counts

	Angular Debris	Core Flake	Biface Flake	Hammerstone Flake	Core	Cobble Tool	Uniface	Biface	Totals
Chert	17	77	42		5	1	2	6	152
Chalcedony	5	31	16		1			1	54
Igneous		4			2				6
Basalt		6	2			2	1		11
Rhyolite	2	14	1		1	1	1		20
Rhyolitic chert	6	16	1		1				24
Sandstone		1							1
Siltstone		4							1
Metamorphic		1							1
Quartzite				1					1
Schist		1							1
Totals	30	155	62	1	10	4	4	9	275

Table 3. Debitage Attributes

	Angular Debris	Core Flake	Biface Flake	Hammerstone Flake	Totals
Cortex:					
0%	22	115	61		198
10-30%	7	20	1		28
40-60%		8		1	9
70-90%	1	4			5
100%		8			8
Platform:					
Cortical		12			12
Cortical & abraded		3	1		4
Single facet		17			17
Single facet & abraded		7	5		12
Multifacet		18			18
Multifacet & abraded		6	3		9
Retouched		8	3		11
Retouched & abraded		7	14		21
Abraded		1	1		2
Collapsed		35	20		55

	Angular Debris	Core Flake	Biface Flake	Hammerstone Flake	Totals
Crushed		2	1	1	4
Absent - snapped		31	10		41
Absent		7	4		11
Obscured		1			1
Portion present: Compete	30	83	28	1	142
Proximal		23	18		41
Medial		7	7		14
Distal		25	6		31
Lateral		17	3		20
Utilized:		21	6		27
Retouched:		2			2
Utilized and retouched		2			2
Total Number	30	155	62	1	248

Table 4. Complete Artifact Dimensions and Edge Angles for Utilized Edges

Artifact Type	Dimensions (mm)						Edge Angle (degrees)			
	n=	Length		Width		Thickness		n=	Angle	
		mean	s.d.	mean	s.d.	mean	s.d.		mean	s.d.
Angular Debris	30	23.3	8.1	15.9	6.3	9.2	4.4			
Core Flake	83	29.2	19.3	27.4	18.4	9.7	9.2	8	36.2	10.1
Biface Flake	28	18.7	6.7	15.2	3.9	3.0	1.0	3	29.7	1.5
Hammerstone Flake	1	15.0		13.0		8.0				
Undiff. Core	1	77.0		40.0		25.0		1	56.0	
Bifacial Core	2	79.0	43.8	73.5	56.1	44.5	29.0	1	60.0	
Multidir. Core	7	69.1	49.7	53.6	26.3	40.1	19.1			
Hammerstone	2	100.0	14.1	62.5	10.6	55.0	21.2			
Chopper	1	105.0		70.0		41.0		1	55.0	
Core Chopper	1	82.0		62.0		24.0		1	62.0	
Uniface	3	73.3	23.5	41.3	1.5	17.3	2.9	3	55.3	5.0
Scraper	1	57.0		36.0		11.0		1	55.0	
Biface	5	36.6	6.7	21.8	6.0	8.0	0.7	5	45.8	6.1
Chir. Point	1	29.0		19.0		5.0		1	38.0	

Table 5. Flake Dimensions by Material (mean in mm)

Material Type	Core Flake				Biface Flake			
	n=	Length	Width	Thickness	n=	Length	Width	Thickness
Chert	39	24.9	24.8	7.7	19	19.6	15.3	2.9
Chalcedony	19	18.7	19.5	6.0	7	15.4	14.3	3.3
Igneous	4	66.2	41.7	18.0				
Basalt	3	23.0	15.3	5.3	1	24.0	18.0	4.0
Rhyolite	7	37.3	34.4	14.9	1	19.0	17.0	3.0
Rhyolitic chert	4	34.2	21.7	9.5				
Sandstone	1	90.0	120.0	70.0				
Siltstone	4	38.2	33.0	11.5				
Metamorphic	1	45.0	102.0	32.0				
Schist	1	78.0	42.0	11.0				

No attempt was made to subdivide and compare assemblages. The sample size is sufficiently small and artifact densities too low for meaningful results. The scraper came from Test Pit 4 and an early phase biface, a middle phase biface, the Chiricahua projectile point, a uniface, and four cores came from the collection grid. Otherwise, two bifaces, two unifaces, the core chopper, and bifacial core were found east of the highway. An unidentified projectile point, chopper, and two early phase and one undifferentiated bifaces were recovered west of the highway.

The lithic assemblage indicates that a variety of activities were performed at LA 104720. Both bifacial and core reduction techniques are represented as well as activities using choppers, and the unidirectional and directional utilization of flakes and formal tools. The presence of so many biface flakes and the amount of heat treatment are consistent with an Archaic use of the site area.

Ground Stone

Except for that comprising Feature 1, a deflated hearth, all ground stone was collected and returned for laboratory analysis. Office of Archaeological Studies standardized ground stone analysis (Bullock et al. 1990) was used to record artifact attributes. Variables recorded include: material type, grain size, preform morphology (cobble or slab variations), production input, shaping, dimensions (length, width, thickness, and weight) and whether that dimension is complete, cross-section for manos, plan view, whether there is a flaked surface or margin, heat modification, the portion of the artifact represented, the function, the ground surface cross section, whether the ground surface was sharpened, primary and secondary wear, alterations, adhesions, direction of striations, and the dimensions and area of the use surface.

Table 6. Ground Stone Material and Artifact Type

	Igneous	Rhyolite	Sedimentary	Quartzite	Quartzitic Sandstone	Totals
Indeter. fragment	2	11	1		6	20 (42.6%)
Abrader	1					1 (2.1%)
Mano	4	1				5 (10.6%)
One-hand mano	4	2	1	1		8 (17.0%)
Two-hand mano	1					1 (2.1%)
Metate fragment	4	6			1	11 (23.4%)
Slab or basin metate		1				1 (2.1%)
Totals	16 (34.0%)	21 (44.7%)	2 (4.3%)	1 (2.1%)	7 (14.9%)	47 (100.0%)

A total of 47 pieces of ground stone were recovered (Table 6). The majority are indeterminate fragments but the assemblage also includes an abrader, and mano and metate fragments. All but three pieces of the ground stone came from the east side of NM 26. These are a metate fragment, a one-hand mano, and an unidentifiable piece of ground stone.

One-hand forms are the predominant mano type and the only metate fragment identifiable to form is a slab or basin metate. Most are igneous rocks, either undifferentiated (34.0 percent) or rhyolite (44.7 percent), with a few of sedimentary (4.3 percent), quartzite (2.1 percent), or quartzitic sandstone (14.9 percent). The majority have preform morphologies that could not be determined (42.6 percent). Rounded (34.0 percent), chunky or angular (2.1 percent), and flattened (4.3 percent) cobbles are more numerous than thick (14.9 percent) and thin (2.1 percent) slabs. Manos and abraders tend to be made from cobble forms (93.3 percent) while metates are more likely to be slabs (66.7 percent). Indeterminate artifacts are largely from indeterminate preforms (80.0 percent) but also include cobbles (20.0 percent).

Production input was rarely determinable (70.2 percent indeterminate). Quite a few (19.1 percent) have no shaping or modification. Three one-hand manos and the basin or slab metate are slightly modified and a one-hand mano is mostly modified. Shaping of the one-hand manos includes grinding (50 percent) and pecking (37.5 percent). The metate fragment is pecked and ground.

Mano cross section is most often biconvex (33.3 percent), with others that are domed with one flat side (16.7 percent), loaf shaped (16.7 percent), or rounded triangular (8.3 percent). Plan view tends to be either oval or rectangular. All of the one-hand manos are oval while the abrader and two-hand mano are rectangular. The rest are indeterminate. Flaked edges are recorded for one

indeterminate fragment and a one-hand mano. The majority of the artifacts are heat fractured. Only 10.6 percent have no evidence of heat fracture.

The 47 pieces of ground stone have a total of 59 use surfaces. Multiple use surfaces are present on four of the indeterminate fragments, the abrader, four of the indeterminate manos, and three one-hand manos. The indeterminate fragments have cross sections that are indeterminate (16.7 percent), flat (50.0 percent), concave (12.5 percent), convex (16.7 percent), and irregular (4.2 percent). The abrader has one flat and one convex face. Indeterminate manos have indeterminate (44.4 percent), flat (11.1 percent), and convex (44.4 percent) surfaces. One-hand manos have flat (27.3 percent) or convex surfaces while the two-hand mano has a flat surface. Metate surfaces are either flat (25.0 percent) or concave (75.9 percent). Surfaces were sharpened on ten indeterminate, one abrader, six indeterminate mano, one one-hand mano, the two-hand mano, and all metate surfaces.

Striations (86.4 percent) are the predominate wear on ground surfaces. Pitting (1.7 percent) and polish (11.9 percent) also occur. Secondary wear consists of pitting or anvil wear on one abrader surface, battering on an indeterminate and three one-hand mano surfaces, polish on three indeterminate surfaces, and additional grinding on a one-hand mano surface.

This small collection of ground stone indicates that seed processing, abrading, and activities associated with anvil use took place. The presence of complete ground stone tools at the site suggests that grinding tools may have been cached and used when the groups returned to the area as part of their seasonal round. The amount of fire fracture raises a number of questions. The rock may have been used in pits for steaming greens, possibly indicating another use season or different kind of use for different populations inhabited the site area. In several instances, the fire-fractured surface had much less of a patina than the use surface, and may indicate that the group who fractured the artifacts occupied the site area much later than those who used the tools for grinding.

EVALUATION

LA 104720 represents one aspect of the seasonal round of highly mobile Archaic groups, including the Chiricahua Cochise. The presence of cobble manos, scrapers, and choppers related to plant processing is consistent with other Chiricahua assemblages (Simmons et al. 1989:47). Archaic groups may have chosen this location because it is the lowest portion of a broad and level plain where vegetation is slightly denser than the surrounding area. Without a permanent or even an impermanent source of water, occupation would have been of short duration, just long enough to harvest and process seasonally abundant plant resources.

Seed grinding is demonstrated by an abundance of mano and metate fragments. Choppers, large and small bifaces, projectile points, a scraper, unifaces, numerous utilized core and biface flakes, an abrader, anvil wear on one ground stone, and the presence of fire-cracked rock indicate that a range of activities took place at LA 104720. The large and dispersed nature of the site and the variety and distribution of artifacts suggest repeated use of the area by highly mobile groups. While at the site, these groups either utilized a number of resources rather than focusing on a single species or they could have returned to the area to exploit additional resources during other seasons.

RECOMMENDATIONS

The research potential for the portion of LA 104720 which lies within the right-of-way has been largely exhausted through field analysis and collection of a portion of the surface assemblage. However, because our test pits and auger tests indicate that subsurface deposits still exist, the area along the right-of-way fence (as indicated in Fig. 2) should be avoided and fenced during highway construction. Much of the surface within the right-of-way has already been disturbed by construction and drainage features. Fencing will preserve those portions that remain.

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APPENDIX 1

Collection Area Artifact and Fire-Cracked Rock

Grid	F.S.	Lithics	Ground Stone	Fire-Cracked Rock	Comments
102N 94 E	48	2			
100N 96E	57	1			
100N 98E	58	4; 1 core			
98N 96E	47	1	1 indet.		
98N 98E	46	1	1 indet.		
96N 92E	56	1			
96N 94E	53	1			
96N 92E	11	6; 1 uniface; 1 core			
94N 94E	44			1	
94N 96E	54, 59	4; 1 biface			
94N 98E	51	1			
92N 92E	43, 61	4; 1 biface	1 indet.		
92N 94E	45	2		2	
92N 96E	50	3			
92N 98E	55	2			
90N 92E	52	1			
90N 96E	49	9; 1 core	1 mano	5	
90N 94E				1	
88N 92E	36	2		2	
88N 96E	34	2	2 indet.	9	
86N 94E	38	2			
86N 96E	42	6		5	
84N 92E	35	1	2 indet; 1 mano	7	
82N 92E				3	
82N 94E	41		2 indet.	2	
80N 92E	40	1			

Grid	F.S.	Lithics	Ground Stone	Fire-Cracked Rock	Comments
80N 94E	33	4	1 indet; 1 mano		
78N 92E	32	3			
78N 94E	30	2			
78N 96E	27	1			
76N 92E	28, 60	1; 1 point			
76N 94E	25	2			
74N 92E	29	1			
70N 94E	26	1			
68N 94E	23	1			
68N 96E	17	3			
66N 92N	21	1			
66N 94E	22	1			
66N 96E	18	1	1 indet.		
64N 96E	19	1 core			
62N 96E	20	2			
60N 96E	24	2			much gravel
58N 94E	16	2			much gravel
58N 96E	14	1			much gravel
58N 98E	12	2			
56N 94E	13	1			much gravel
56N 96E	15	1			much gravel
Totals		92; 1 uniface; 2 bifaces; 1 point; 4 cores	14	37	