

MUSEUM OF NEW MEXICO
OFFICE OF ARCHAEOLOGICAL STUDIES

**ARCHAEOLOGICAL TESTING RESULTS AND DATA RECOVERY
PLAN FOR SITES ALONG U.S. 380, SOCORRO COUNTY,
NEW MEXICO**

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**with a contribution by
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ADMINISTRATIVE SUMMARY

From March 25 to April 5, 1991, the Office of Archaeological Studies, Museum of New Mexico, conducted archaeological test excavations at two sites along U.S. 380 in Socorro County, New Mexico. They are 9.6 km (6 miles) east of Bingham, on land belonging to the State of New Mexico. Portions of each site extend into the existing right-of-way. The New Mexico State Highway and Transportation Department intends to conduct highway construction within the existing right-of-way in this area.

LA 81606 is a dense ceramic and lithic artifact scatter associated with the Tajo phase (A.D. 800-1000). The site is on both sides of the highway, with the highest density area outside of the right-of-way on the south side. The high number of surface artifacts, and possible buried structures, suggests that the site may yield important information on local prehistory. However, the portion of the site within the right-of-way contains a much lower artifact density, and the only subsurface feature found was a small ashpit, probably associated with features outside of the right-of-way. We do not believe that the site portion within the right-of-way has the potential to yield important information on prehistory.

LA 71726 is also a dense ceramic and lithic artifact scatter associated with the Tajo phase (A.D.800-1000), located on both sides of U.S. 380. The site contains buried deposits, including at least one pithouse or storage feature, and at least two additional features of unknown function, which are in the highway right-of-way. The site portion outside of the right-of-way appears to have minimal potential to yield important information. The site portion within the right-of-way has the potential to yield important information on local prehistory, particularly regarding issues of seasonality, subsistence, and regional phase sequences. This report includes a data recovery plan for LA 71726.

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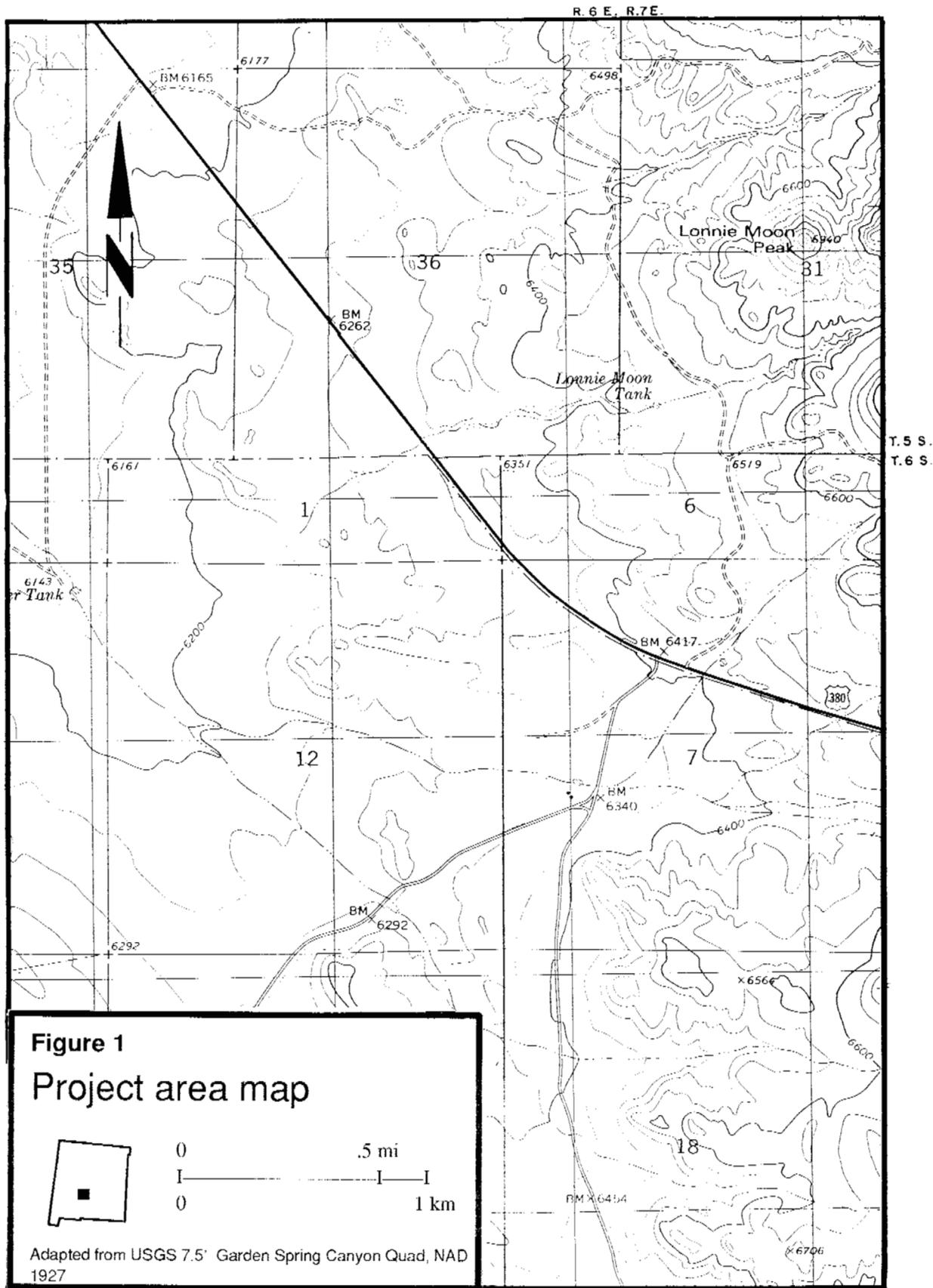
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INTRODUCTION

From March 25 to April 5, 1991, the Office of Archaeological Studies, Museum of New Mexico, conducted archaeological test excavations at two sites along U.S. 380 in Socorro County, New Mexico (Fig. 1). The testing program was requested by the New Mexico State Highway and Transportation Department. A highway archaeologist had located one new site (LA 81606) and relocated a previously recorded site (LA 71726) during the survey of the right-of-way for proposed highway construction. LA 71726 was given a new site number during the survey--LA 81607--which has since been deleted from the site files. In this report and future reports, this site is referred to as LA 71726. The project area is 9.6 km (6 miles) east of Bingham, on land owned by the State of New Mexico. The project was directed by Daisy F. Levine, assisted by Laurie G. Evans, Joan K. Gaunt, and Marcy T. Snow.

Site locations and legal descriptions are provided in Appendix 1. The survey was completed under State of New Mexico permit no. SE-63.

Both sites are ceramic and lithic artifact scatters dating to the Tajo phase (A.D. 800-1000). Portions of each site extend into the existing right-of-way on both sides of U.S. 380. At LA 81606, the densest part of the site is outside of the right-of-way, and buried structures probably exist here. We do not believe the site portion within the existing right-of-way has the potential to yield important information on local prehistory. Buried features exist at LA 71726 within the right-of-way, including a possible pit structure. Deposits outside of the right-of-way appear minimal. The site portion within the existing right-of-way has the potential to yield important information on local prehistory, particularly regarding issues of seasonality, subsistence, and regional phase sequences.



ENVIRONMENT

The sites are located at the south end of Chupadera Mesa, at an elevation of 1,924 m (6,310 ft), on either side of a large unnamed drainage, [REDACTED] southeast of Lonnie Moon Peak. They are on a flat to gently sloping alluvial plain. The north end of the Oscura Mountains are about [REDACTED] to the southwest, Taylor Draw is [REDACTED] to the east, and the west edge of the Jornada del Muerto is approximately [REDACTED] t. There is no permanent water supply in the vicinity, though numerous intermittent streams flowing out of Chupadera Mesa drain the area.

Soils in the area belong to the La Fonda Association, and consist of La Fonda loam and Alicia loam. La Fonda soils develop on the lower portions of alluvial fans (Neher and Bailey 1976:14). These soils are deep and well drained. They have developed from moderately fine-textured alluvial sediments on old alluvial fans. La Fonda soils are moderately permeable with high available water capacity. Plant roots can grow to a depth of at least 15 cm (6 in). Given enough annual moisture, these soils are suitable for agriculture (Neher and Bailey 1976:14).

Climatic data is from Bingham, [REDACTED], and Carrizozo, [REDACTED] t. The project area has a semiarid climate with a mean annual precipitation of 240 mm (9.46 in) at Bingham, and 300 mm (11.82 in) at Carrizozo. Most of the rain falls in July through September as a result of summer thunderstorms. Mean annual temperature is 12.3 degrees C (54.2 degrees F), with average summer highs of 24.3 degrees C (75.7 degrees F) and winter lows of 2.8 degrees C (37.1 degrees F). The frost-free period is 200-230 days (Tuan et al. 1973:192; Peckham 1976:39).

The sites are in the piñon-juniper ecozone at the foot of Chupadera Mesa. Piñon (*Pinus edulis*) and juniper (*Juniperus monosperma*) are associated with grasses, including various forms of grama (*Bouteloua* sp.), giant dropseed (*Sporobolus giganteus*), and alkali sacaton (*S. airoides*). Shrubs in the area include banana yucca (*Yucca baccata*), soaptree yucca (*Yucca elata*), mountain mahogany (*Cercocarpus montanus*), and snakeweed (*Gutierrezia sarothrae*).

The only fauna observed was pronghorn (*Antilocapra americana*). Fauna reported in the area include deer (*Odocoileus* sp.), coyote (*Canis latrans*), badger (*Taxidea taxus*), skunk (*Mephitis* sp.), porcupine (*Erithizon dorsatum*), jackrabbit (*Lepus* sp.), cottontail (*Sylvilagus* sp.), and various rodents (Peckham 1976:39).

CULTURAL OVERVIEW

Very little work has been done in the project area, though recent surveys by Human Systems Research on the White Sands Missile Range to the south (Shields and Laumbach 1989; Sale 1988; Shields 1987; Laumbach 1986; Clifton 1985; Laumbach and Kirkpatrick 1985) have greatly contributed to the knowledge of local cultural developments and the documentation of the types of sites found. Otherwise, research that has produced established cultural syntheses refer to areas 72 km (45 miles) to the east, where Kelley (1984) defined the prehistoric sequence of the northern Sacramento and Jicarilla mountains; 48 km (30 miles) to the west, where Marshall and Walt (1984) defined the riverine sequences in the Rio Abajo region; 64 km (40 miles) to the north, where Caperton (1981) discussed developmental sequences of the northern Chupadera and Jumanes Mesas; and the Tularosa Basin to the south and east, which Lehmer (1948) defined as the Jornada Branch of the Mogollon. This leaves a wide undocumented area, roughly from San Antonio on the west, to Carrizozo on the east, and into the southern Chupadera Mesa to the north.

Paleoindian

The Paleoindian period is characterized by large, fluted lance points used in the hunting of now-extinct mammoth (*Mammuthus primegenus*) and bison (*Bison antiquus*). Archaeological remains in the area are minimally documented, with the exception of the Mockingbird Gap site, 27 km (17 miles) to the west in the northern Jornada del Muerto. Weber, who investigated Mockingbird Gap (1966), located extensive Paleoindian campsites with hearths and light artifact scatters. Sites are often multicomponent, with diagnostic projectile points ranging from Clovis, Folsom, and Midland to Plano (Marshall 1976). Only one campsite was excavated, and to date there is no published report. The area, now a dry basin, was once the location of numerous early Pleistocene lakes, a typical situation for Paleoindian sites.

On the White Sands Missile Range, evidence for Paleoindian occupation is limited to two Folsom point fragments, both found in questionable contexts (Laumbach and Kirkpatrick 1985:66). However, as Laumbach and Kirkpatrick suggest, the extensive grassy plains to the west of the project area may have been an ideal environment to support the Pleistocene megafauna hunted by the Paleoindian population.

Archaic

Around 7000 B.C., the large game animals were replaced by smaller species, and plant resources were diminished. The subsistence economy gradually shifted from one of complete nomadism to a round of seasonal resource procurement. Irwin-

Williams (1973) has defined the Oshara tradition of the Archaic period for the northern part of the state. Her sequence begins with the Jay phase, at 5500 B.C., and ends with the En Medio phase, around A.D. 400.

Weber (1963) has modified Irwin-Williams's sequence to apply to the southern part of the state, specifically to his work in the Rio Abajo area. He has recognized typological equivalents of both Chiricahua and San Pedro Cochise, elements of the Oshara Tradition, and several components of the Bat Cave sequence among projectile points that characterize Archaic complexes of the area. He characterizes Archaic sites as mainly scattered camp sites with abundant lithic artifacts, ground stone, and hearths. Locations range from river terraces, open plains, mountain foothills, canyons, and high ridges and saddles (Weber 1963:228).

A few Archaic sites have been found on White Sands Missile Range to the south of the project area. Sites include lithic artifact scatters, hearths, and rockshelters. Sites are generally small and artifact assemblages are limited, suggesting a small population and a limited period of occupation (Laumbach and Kirkpatrick 1985:67).

Problems arise when discussing the pithouse and pueblo periods, because, as stated earlier, the project area is surrounded by four different regional phase sequences, and it is just outside the northwest corner of what Lehmer (1948) has described as the Jornada Branch of the Mogollon. Therefore, rather than discuss all four, only the Rio Abajo synthesis will be discussed because it most aptly applies to the study area, based on ceramic typology. The boundaries of the Capitan phase are unclear, and it may encompass the study area, but this is a poorly defined and documented phase (Wiseman 1985). Table 1 presents the other phase sequences, with references. The following discussion is abstracted from Marshall and Walt (1984).

San Marcial Phase (A.D. 300-800)

The San Marcial phase is the earliest representation of sedentary riverine adaptation in the Rio Abajo area. It is partially contemporaneous with the Basketmaker III and Pueblo I periods in the north and northwest. Site locations correspond to areas of high Archaic site density, suggesting that this complex evolved from the Archaic tradition. Settlements are small, averaging four noncontiguous rooms per site; site size ranges from one to eight rooms. Surface structures were rock-based jacal and cobble masonry. Pit structures are rare. Midden debris was most frequently scattered over the site, rather than in a concentrated deposition.

The ceramic complex was first recognized by Mera (1935). It consists predominantly of plain brown Mogollon wares in association with San Marcial Black-on-white, a Basketmaker III ware. Small amounts of red-slipped brown wares, a Mogollon red-on-terracotta ware, and Anasazi plain gray wares were found at the type site. Collections by Marshall and Walt at several early Puebloan sites in the Rio Abajo area revealed brown wares but a lack of San Marcial and Cibola Gray Ware. They therefore extended the definition of this phase to include all early formative sites that

exhibit a brown ware industry. This rule can not be consistently applied, though, since plain brown complexes serve as the foundation of Mogollon cultural development throughout the southern province. The lack of information on this phase is a problem, and there will have to be more archaeological investigation to accurately define it.

Tajo Phase (A.D. 800-1000)

The Tajo phase is the first major sedentary occupation of the riverine environment in the Rio Abajo. Along the Rio Grande, sites are small clusters of one to ten surface rooms with occasional pit structures. Pit structures are usually found adjacent to surface houses, most often on benches. Most surface structures are linear unit houses of cobble-based jacal construction. During the Rio Abajo survey, 15 Tajo phase sites were recorded, 6 of which had pit structures, either singly or in association with room blocks.

The ceramic complex is mainly plain and ribbed Mogollon brown wares, with Red Mesa Black-on-white occurring frequently. This is an intrusive Cibola ware from the north and northwest; there appears to be no native white ware industry during this phase. Minor amounts of Cibola Gray Ware, Mimbres White Ware, and Elmendorf White Ware are found on some late Tajo sites. Red Mesa Black-on-white is found more often on early Tajo phase sites, while Puerco- and Gallup-style Cibola White Wares occur in the late Tajo phase, though always in association with Red Mesa Black-on-white. The occurrence of Cibolan ceramics indicates a blending of Anasazi and Mogollon populations during this time.

The only excavated site in the project area is a late Tajo phase settlement excavated by Peckham (1976). This site, LA 6565, is the largest of a cluster of 25 sites along Taylor Draw, near the southern end of Chupadera Mesa. LA 6565 consists of 4 pithouses, a kiva, and 22 slab-lined surface rooms. Plain brown ware comprised over 90 percent of the ceramic assemblage, with small amounts of Red Mesa Black-on-white present.

Most of the ceramic sites recorded during survey of the White Sands Missile Range fall temporally within the Tajo phase, indicated by brown wares and Red Mesa Black-on-white. So far, over 20 sites of this phase have been recorded (site lists in Sale 1988; Shields 1987; Laumbach 1986; Clifton 1985; Laumbach and Kirkpatrick 1985). Recently, a possible pit structure with associated surface rooms and Tajo phase ceramics were recorded during survey (Karl Laumbach and Mark Seachrist, personal communication, 1991).

Early Elmendorf Phase (A.D. 950-1100)

The Early Elmendorf phase is roughly contemporaneous with the Pueblo II period. The architecture during this time is similar to the Tajo phase, with small jacal

pueblos and occasional pit structures. The essential difference is the clustering of the room blocks into village groups, with a series of small, closely spaced unit-houses. Small settlements averaged 4 rooms per site; large settlements averaged 54 per site.

Because the number of rooms did not change much from the Tajo phase, Marshall and Walt believe that the population did not increase, but rather the shift from small scattered communities into aggregated villages indicates major changes in social organization.

Pit structures are found at almost half of early Elmendorf sites. Diameters average 4-6 m, though one large rectangular pit structure was found.

Prior to this period, the population in the south imported white wares from the adjacent Anasazi area. During the early Elmendorf phase, the people of the Rio Grande district produced their own types, known as Elmendorf White Wares. These types resemble Chupadera Black-on-white (Casa Colorado Black-on-white is defined as an unscored Chupadera Black-on-white, and Elmendorf Black-on-white as a carbon-painted Chupadera Black-on-white), and thus have not been clearly recognized. The brown ware industry is similar to that of the Tajo phase. Plain brown wares primarily occur, but there is a slight increase in textured types, such as Pitoche Ribbed and Pitoche Rubbed-ribbed.

Late Elmendorf Phase (A.D. 1100-1300)

This phase is contemporary with the Pueblo III period. It is characterized by the aggregation of Pueblo II village populations into large fortified pueblos. Unstable social factors are seen as the cause for the coalescence of the population.

Masonry was frequently used, but cobble-jacal structures are also found. There was considerable architectural variety, suggesting a period of experimentation and diversity. The population of the Rio Abajo region increased slightly, but most pueblos exhibited very little midden deposition, suggesting a brief occupation.

Late Elmendorf sites are found in two distinct situations. Isolated pueblos and small villages continue to be built on benches, characteristic of the Tajo and early Elmendorf phases. However, this included a minority of the Elmendorf population. Large masonry pueblos, 22-54 rooms, were built on elevated buttes, knolls, and benches in potentially defensive locations.

Pit structures are found occasionally, often in plazas and thus resembling kivas. Most are circular, 4 to 8 m in diameter, though a few rectangular pit structures have been recorded.

The ceramic assemblage is similar to that of the early Elmendorf phase. Pitoche Brown Wares and Elmendorf White Wares still occur, with an increase in the textured

brown wares. The presence of intrusive White Mountain Redware is diagnostic of this period.

Piro Phase (A.D. 1300-1680)

The Piro phase has been divided into the Ancestral and Colonial phases. The Ancestral Piro phase (A.D. 1300-1540) begins with the emergence of the glaze ware ceramic industry and ends at the time of Spanish contact. It is characterized by the coalescence of the population into large plaza villages, a substantial increase in population, and the expansion into or colonization of riverside areas that were previously unoccupied (Marshall and Walt 1984). Multistoried and terraced noncontiguous room blocks of masonry or puddled coursed adobe were built around plazas.

Glaze A is the dominant type in the ceramic assemblage. Minor amounts of Glaze C and D are found, though Glaze B is notably absent. Utility wares are plain gray Rio Grande wares.

During the Colonial Piro phase (A.D. 1540-1680), the population dropped substantially, probably from European diseases introduced as a result of Spanish contact. Large sections of Ancestral pueblos were abandoned, and Colonial occupations were restricted to certain room block areas. However, numerous small Colonial style and large traditional style villages were established during this period. Room blocks contained large square rooms aligned in grid patterns, often incorporating elements such as courtyards, portals, and corral enclosures. The Spanish built missions and imposed the *encomienda* system on the Piro pueblos during this time. As the Piro attempted to escape from Spanish domination, a substantial portion of the population moved west, settling in two large pueblos near Magdalena.

The ceramic assemblage is characterized by local variants of Glaze E and F types, in association with Rio Grande gray wares. Smaller amounts of majolica and Mexican earthenwares are present. Occasionally, Tabira, Jemez and Tewa white ware intrusives are found.

In Mera's study of the Rio Grande glaze paint area (Mera 1940), he examined numerous sites which he grouped into five time periods. Period 1 is dated A.D. 1350-1450 and is characterized by the presence of Glaze A and Glaze B. There is a dense cluster of sites along Chupadera Arroyo, at the base of Chupadera Mesa, dating to this time period. Almost all of these sites represent permanent habitations rather than seasonally occupied sites. This area is roughly 10-12 miles northwest of the project area. Mera documented more Period 1 Piro sites here than along the Rio Grande.

During subsequent periods, the population was more spread out, and only a few sites were present along Chupadera Arroyo. A small group of sites was present in Period 5 (A.D. 1650-1700: Glaze F). Again, most are permanent habitations.

Historic Period

There is no archaeological evidence of occupation of the White Sands Missile Range, immediately south of the project area, from roughly A.D. 1050 until the late 1800s. The general area was utilized by Apaches historically (Basehart 1973); however, only one Apache site has been found on surveys of White Sands (site list in Laumbach 1986:17). Small portions of the prehistoric population may have lasted longer, based on the presence of a fieldhouse with Mimbres Classic Black-on-white at Taylor Draw, but no later ceramic assemblages have been documented. Only two glaze ware sherds were found on the Sgt. York survey (Laumbach and Kirkpatrick 1985:68), though the surrounding area was heavily populated (Marshall and Walt 1984; Kelley 1984; Caperton 1981).

During the late nineteenth-early twentieth century, the area was homesteaded and the inhabitants were ranchers and miners. Raising cattle and horses for sale and sheep and goats for wool was the primary occupation (Laumbach and Kirkpatrick 1985:71). Mines were worked in the Oscura Mountains to the south and near Bingham to the west. Today, residents primarily ranch or work for White Sands Missile Range.

FIELD METHODS

At each site, artifacts were marked with pinflags to observe distribution and delineate the limits of the site. A 3 m radius dogleash collection unit was then placed in areas of high artifact density. All surface artifacts within this area were collected for laboratory analysis. The center of each dogleash was used to establish a corresponding test pit, becoming the northeast corner of a 1 by 1 m square. Excavation was conducted in 10 cm levels. Fill was screened through ¼" mesh screen, and artifacts, botanical samples (corn), and charcoal samples (for carbon-14 dating) were collected.

Auger transects were placed throughout both sites, on both sides of the highway. Because of limited time and the large area of the sites, test intervals varied from 2 to 4 m. If an auger test showed the presence of subsurface artifacts or charcoal, surrounding tests were placed at 2 m intervals.

Seven test pits, eight dogleashes, and five lines of auger tests were placed at LA 81606. Four test pits, five dogleashes, and two lines of auger tests were on the south side of the highway, and three test pits, three dogleashes, and three lines of auger tests were on the north side. Dogleash 8 was placed in an area of high artifact density to increase the sample for analysis, but a test pit was not excavated here as we felt that enough subsurface testing had already been done. Auger test intervals at LA 81606 were every 4 m.

Six dogleashes and six test pits were placed at LA 71726, three on each side of the highway. Four auger lines were laid out, three on the south side and one on the north side of the highway. Intervals on the south side were every 4 m, unless subsurface artifacts or charcoal were found; in this case, the interval dropped to 2 m around these locales. On the north side of the highway, the interval was every 3 m. Extensive auguring was done around the possible structure (Test Pit 1) to define its limits.

If the nature of a feature could not be determined from a single test pit, a contiguous test pit was added. A plan view was drawn initially, and when a portion of the feature was exposed, a profile was drawn to illustrate stratigraphy and depth. All features were photographed.

Upon completion of the testing, the site was mapped with a transit and stadia rod or 30 m tape. The site map included areas within and outside of the right-of-way, test pit and feature locations, highway location, and topography. All test pits were backfilled.

ANALYTICAL METHODS

Ceramic Artifacts

The ceramics collected during the testing phase were analyzed for type and vessel form only. Because this was a rough sort, brown wares were lumped into a general category called "Smoothed brown ware," rather than try to type them as Jornada Brown, Alma Brown, or the various subtypes of these two brown wares. Not enough is known of this area to accurately type the brown wares without performing a detailed analysis of temper, preferably with petrographic analysis.

Two other categories that may not be self-explanatory are "Red-fired brown ware" and "Orange-fired brown ware." These types were unslipped and had either a red or an orange paste and surface color, with the same feldspar and quartz temper as the brown wares. They may have been terracotta wares, such as San Andres Red-on-terracotta or Three Rivers Red-on-terracotta, but without any design this could not be determined.

Lithic Artifacts

Attributes examined included artifact type, material type and quality, percentage of dorsal cortex, portion, alterations, wear patterns, utilized edge angles, and dimensions (length, width, and thickness). Formal tools were artifacts that were intentionally altered to produce specific shapes or edge angles. Alterations took the form of unifacial or bifacial retouch, and artifacts were considered intentionally shaped when retouch scars extended across two-thirds or more of a surface. Lithic debris that was not altered into formal tools was classified as debitage. Both formal tools and debitage were analyzed.

Debitage was divided into flakes and angular debris by the presence or absence of striking platforms, bulbs of percussion, and recognizable ventral surfaces--flakes possess these attributes and angular debris lack them. Attributes recorded for flakes only included platform type, presence of platform lipping, direction of dorsal scarring, and distal termination type. Artifact definitions were consistent with those presented by Chapman (1977:374-378), Chapman and Schutt (1977:85-86), and Schutt and Vierra (1980:50-55).

To facilitate discussion of reduction stages, a set of physical attributes was used to assign flakes to the primary, secondary, and tertiary reduction stages. Primary and secondary flakes are produced during core reduction--primary reduction is the removal of the weathered cortex of a nodule, and secondary reduction is the removal of interior flakes for use or further modification. Modification of the byproducts of core reduction into formal tools constitutes the tertiary reduction stage.

Primary and secondary core reduction were distinguished by the percentage of dorsal cortex on flakes. Primary flakes had 50 to 100 percent of their dorsal surfaces covered by cortex, while cortex covered 0 to 49 percent of the dorsal surfaces of secondary flakes. Flakes produced during the tertiary reduction stage were biface flakes. They were distinguished from primary and secondary flakes by a polythetic set of variables (as defined by Acklen et al. 1983, and listed in Appendix 2), which took flake size, shape, and platform characteristics into account.

TESTING RESULTS

LA 81606

LA 81606 is in a flat to gently sloping area, at the foot of the west slope of Chupadera Mesa. It is a large ceramic and lithic artifact scatter (50 m north-south by 110 m east-west), on both sides of U.S. 380 (Fig. 2). The main portion of the site is on the south side of the highway. Site limits are both within and outside of the existing right-of-way. The main site area, with the highest artifact density, is outside the right-of-way on the south side.

Seven test pits, eight dogleashes, and five lines of auger tests were placed at LA 81606. Culturally sterile fill was encountered in Test Pits 1, 2, 4, 5, 6, and 7 by the base of Level 2 (20 cm below surface). Level 1 (0-20 cm below surface) generally was about 5 cm of loose eolian sand over a slightly compacted dark tan sandy clay. Artifact counts in this level were moderately high, ranging from only 10 in Test Pit 6 to 59 in Test Pit 7 (average count is 32). The number of artifacts dropped dramatically by Level 2 (11-20 cm below surface), from none in Test Pit 3 and 4 to a high of 7 in Test Pit 5 (average count for this level is 3). Level 2 was a hard-packed brown-red clay. Auguring in each test pit below the base of Level 2 revealed that this clay stratum continued to about 50-80 cm below surface, and overlay a stratum of fine, powdery pinkish tan sand mixed with caliche. Auguring in test pits proved that there was no cultural fill below Level 2.

Test Pit 3 was the only area that revealed any possible subsurface cultural remains. An amorphous charcoal stain showed up at the base of Level 1 (10 cm below surface) in the northeast corner of the grid. By Level 2 (20 cm below surface), it was still present in this corner, and the rest of the grid exhibited mottling of dark soil mixed with sterile red clay. A few pieces of burned and fire-cracked rock were present. The mottling was gone by Level 3 (30 cm below surface), replaced by sterile red-brown clay, though the charcoal stain was still present. Twenty-seven artifacts were found in Level 1, 3 in Level 2, and none in Level 3. To further investigate this feature and determine whether or not it was cultural, the southeast corner of the grid to the north (Test Pit 3a) was excavated. The stain was clearly defined at the base of Level 2, as a dark semicircular area 24 cm in diameter, bordered by a rodent tunnel on the west side. No artifacts were found in this level. Auger tests were conducted around the feature to determine its extent, at 1 m intervals. No other subsurface cultural fill was found in the auguring, excavated 80-90 cm below surface. The stain was therefore taken down one more level (30 cm below surface). The fill in this level was black and mixed with charcoal; three sherds were found in the fill (two burned, one unburned). By the base of Level 3, though, the mottled soil was present, and under this it was sterile.

This feature may have been a hearth or ash pit, based on the burned soil and the fire-cracked rock. Testing revealed no associated features, subsurface artifact concentrations, or occupation surfaces in the right-of-way. Because the heaviest surface artifact density is outside of the right-of-way, subsurface features may exist

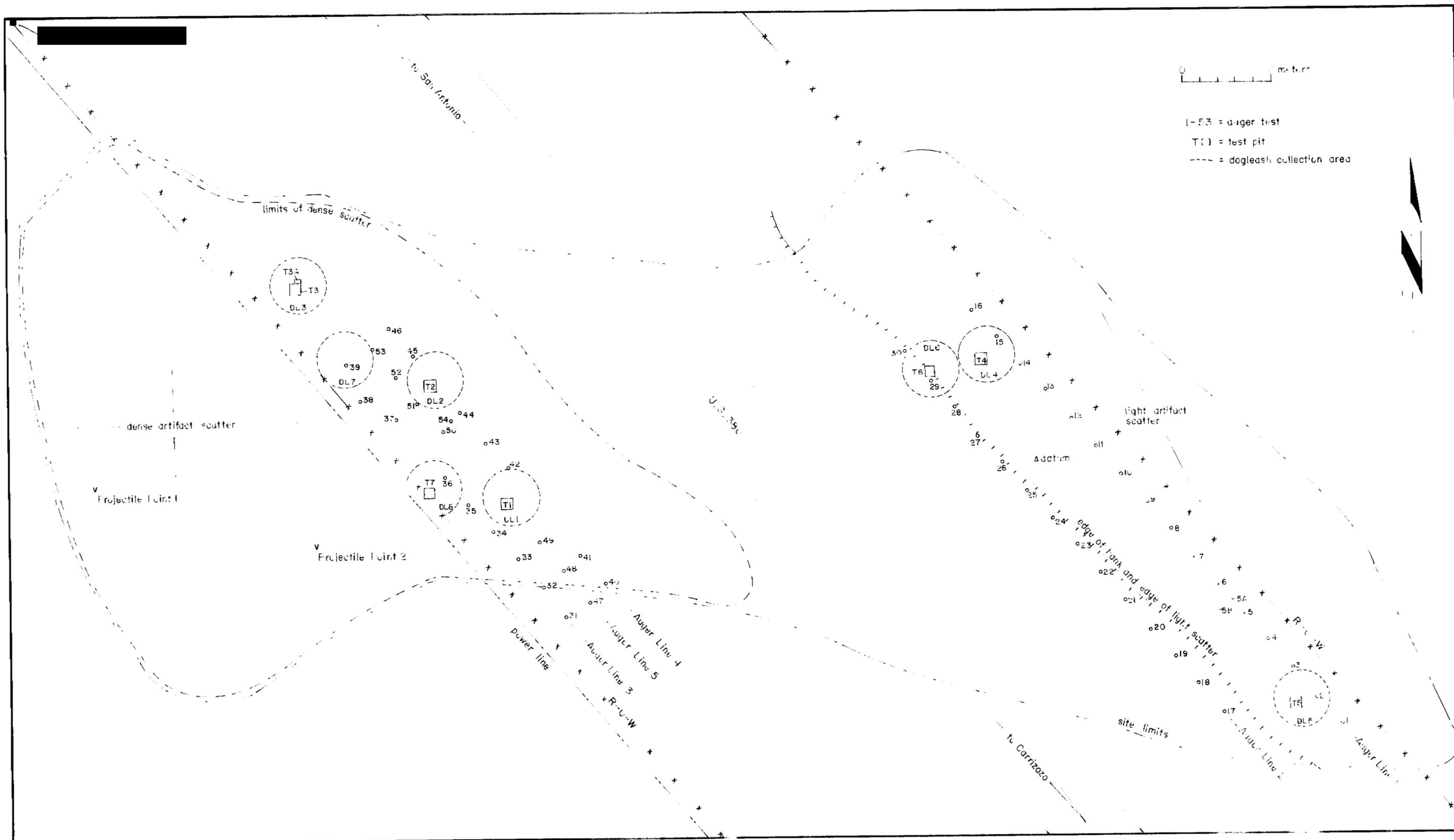


Figure 2. LA 81606 site map.

there.

Dogleashes were placed in areas of artifact concentrations, though compared to the density outside of the right-of-way, the frequencies from these samples are relatively low. The exceptions are Dogleash (DL) 1 and 8. DL-1 was placed in a blown-out area that was slightly lower than the surrounding landscape; 96 artifacts (84 ceramic, 12 lithic) were collected from this sample. DL-8 was placed along the fenceline in a dense concentration that continued outside of the right-of-way. One hundred and thirty artifacts were collected from this sample area (107 ceramic, 23 lithic). Table 2 presents artifact counts from all of the dogleash sample areas. Surface collection accounted for approximately 23 percent of the area of the artifact scatter within the right-of-way.

Table 2. Artifact Counts from Dogleashes, LA 81606

Dogleash	Ceramic Artifacts	Lithic Artifacts	Ground Stone	Total
1	84	12		96
2	29	1		30
3	21	1		22
4	7	10		17
5	48	11		59
6	13	2	1	16
7	26	5		31
8	107	23		130
TOTAL	335	65	1	401

The auger transects corroborated that the stratigraphy throughout the site was consistent with the stratigraphy revealed in auguring the test pits. Auguring stopped when the powdery sand and caliche stratum was reached, which began at anywhere from 50 to 100 cm below surface, though usually between 80 and 100 cm below surface. Artifacts were found in three of the auger tests. In Auger Line 1, on the northeast side of the highway, one sherd was found 23-33 cm below surface. Two sherds and one lithic artifact were found in Auger Line 3 on the southwest side of the highway, at 19-29 cm below surface. However, these artifacts were in an auger test adjacent to DL/Test Pit 8, which was in a high artifact density area. One sherd was found in Auger Line 5, at 40-50 cm below surface.

Ceramic Artifacts

A total of 468 sherds were examined from LA 81606. Table 3 presents ceramic types and frequencies by vessel form from LA 81606.

Table 3. Ceramic Types and Vessel Forms from LA 81606

Ceramic Type	Unknown Vessel Form	Jar	Bowl	Total
Smoothed brown ware	427	4	11	442 (94.4%)
Red-slipped brown ware	1			1 (0.2%)
Orange-fired brown ware		1		1 (0.2%)
Red-fired brown ware	3		3	6 (1.3%)
Red Mesa Black-on-white	1		3	4 (0.9%)
Undifferentiated Cibola White Ware	10		3	13 (2.8%)
Undifferentiated Mimbres White Ware	1(?)			1 (0.2%)
TOTAL	443 (94.7%)	5 (1.1%)	20 (4.3%)	468 (100.0%)

With so little variation in ceramic types at this site, it is difficult to assign an accurate date of occupation. The majority of the assemblage is brown wares (94.4 percent). Based on Marshall and Walt's (1984) description of the Tajo phase, LA 81606 fits chronologically within this time span (A.D. 800-1000). It probably belongs to the early Tajo phase (A.D. 800-900) based on the presence of Red Mesa Black-on-white and the apparent absence of Puerco and Gallup Black-on-white sherds. However, it is not possible to ascertain whether the undifferentiated Cibola White Ware (2.8 percent) recorded at LA 81606 is also Red Mesa Black-on-white, or a later Cibola White Ware.

Lithic Artifacts

A total of 90 lithic artifacts was recovered from LA 81606. Like LA 71726, locally available silicified siltstones dominate the assemblage, comprising 76.7 percent (Table 4). Only Yeso Formation silicified siltstone was present in the assemblage. Undifferentiated cherts were the second most common material (17.8 percent), followed by limestone (3.3 percent), and undifferentiated igneous rocks (2.2 percent). None of the debitage had waterworn cortex, suggesting that raw materials were procured at or near their sources.

Debitage was produced by a simple core-flake reduction trajectory. Secondary core flakes comprised 96 percent of the flake assemblage, while primary core flakes made up only 4 percent. Most flake platforms were simple and unmodified, and only one was altered by abrasion (Table 5). As this flake was struck from a core rather than a tool, it is likely that core platforms were sometimes modified to facilitate flake removal. Though flakes with multifacet platforms were common, they were struck from multidirectional cores rather than tools. Two pieces of debitage exhibited evidence of thermal alteration, but both seemed to have been heated accidentally.

Both formal and informal tools were found, but were uncommon. The formal tools were chert projectile points, and the informal tools included a marginally retouched chert flake and two pieces of utilized silicified siltstone debitage. One of the projectile points was a small, triangular, side-notched arrow point, while the other was a stemmed dart point. The former type is commonly found on ceramic sites in this area (Laumbach and Kirkpatrick 1985), and the latter is difficult to assign a date. Its size and the fact that it is stemmed rather than notched suggests an Archaic affinity, and it is similar to Thoms's (1977:114-116) late Archaic En Medio contracting stem

Table 4. Artifact Type by Material Type, LA 81606

Material	Core Flake	Angular Debris	Core	Projectile Point
chert	11	3	-	2
silicified siltstone	60	7	2	-
limestone	1	2	-	-
undiff. igneous	2	-	-	-
totals	74	12	2	2

Table 5. Flake Platform Information, LA 81606

Platform type	Number	Percent
cortical	1	1.4
single facet	38	51.4
multifacet	15	20.3
multifacet and abraded	1	1.4
collapsed	7	9.5
absent (snap)	6	8.1
Absent (BIM*)	6	8.1

* broken in manufacture

variety. Conversely, it is also similar to Gossett's (1985:125) Type 29, which dates to the Reserve phase or later. An Archaic affinity is most likely, suggesting there is either an underlying Archaic component at the site, or the point was collected elsewhere and curated by site occupants. However, manufacture and use during the ceramic period cannot be ruled out.

The preponderance of expediently produced core flakes, lack of large unspecialized bifaces, and lack of debitage removed from bifaces suggests that the site was occupied by a sedentary rather than mobile population (Kelly 1988). It also suggests that the large stemmed dart point found on LA 81606 was collected from an earlier site and transported to this location.

LA 71726

This site is on a bench above an unnamed drainage. It is a large (56 m north-south by 100 m east-west) ceramic and lithic artifact scatter, on both sides of U.S. 380 (Fig. 3), approximately [REDACTED] LA 81606. The site limits extend outside of the right-of-way on both sides of the highway, but the densest part of the site is within the right-of-way.

Six dogleash sample units and six test pits were placed at this site, three on each side of the highway. Cultural features were encountered in Test Pits 1, 5, 6, and Auger Test 21.

Test Pit 1, on the south side of the highway, was placed in an area of high artifact concentration and soil staining. Charcoal and dark soil and a high number of artifacts started at Level 1, continuing to Level 10 (Feature 1). At the base of Level 7, a diagonal line became visible, which appeared to be a wall. Inside this line, the fill was dark, with charcoal, and outside (the southwest corner of the grid) was sterile orange-brown soil. Levels 7 through 10 were excavated only inside this possible wall (Fig. 4). Artifact counts were high, averaging 60-70 per level through Level 9. In addition, burned corn and large amounts of charcoal were found. Starting in Level 4, and continuing through Level 10 (100 cm below surface), charcoal samples of sufficient size for carbon-14 samples were collected. Burned corn was collected from Level 9 (80-90 cm below surface). A sterile stratum, the top of which is probably a floor, was hit in Level 10 (90-100 cm below surface). This was an uneven layer, with large chunks of adobelike material, which may be wall-fall. Auguring confirmed that fill below Level 10 was culturally sterile. Extensive auguring outside of Test Pit 1 indicated that the structure is approximately 3 m in diameter; therefore it could be either a habitation or a storage feature. A hearth or ash pit was found by auguring, but it was not possible to determine if this feature was inside or outside of the structure. It is at least 25 cm thick, starting at 60 cm below surface. A rock was encountered at 85 cm below surface, and auguring stopped. This also occurred in an adjacent auger test.

Test Pits 5 and 6 on the north side of the highway also revealed subsurface cultural material (Feature 2). A semicircular charcoal stain first appeared at the base of Level 1, in the northwest corner of Test Pit 6. After completing Level 2, where the stain became more visible, Test Pit 5 was opened as a contiguous grid to the north. The circular stain continued into the southwest corner of this grid, and chunks of charcoal and staining extended throughout the west half of Test Pit 5 (Fig. 4). Fire-cracked rock was present in the stain area in both grids. Burned corn was found in Test Pit 5, 40 cm below surface. This feature is probably a hearth or roasting pit.

The other area of possible subsurface cultural remains is around Auger Test 21, on the south side of the highway (Feature 3). Charcoal was found at 27 cm below surface, and the soil was a darker brown than in the surrounding auger tests. Rock was hit at 28 cm below surface, and at the same depth in an adjacent test 30 cm away, which was suspicious due to the lack of surface and subsurface rock in the area. Four additional auger tests were placed around Auger Test 21, each 1 m away in all four

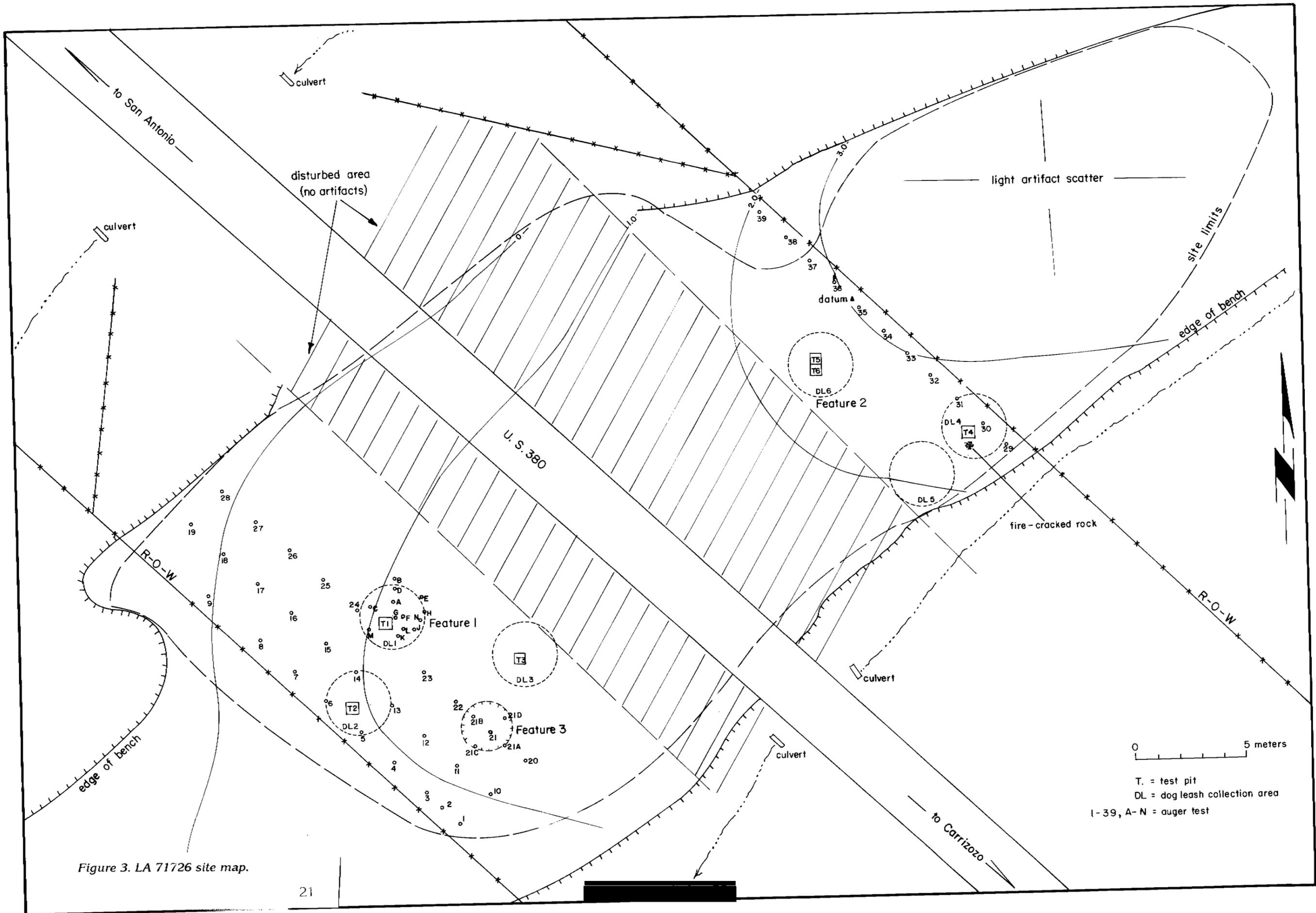


Figure 3. LA 71726 site map.

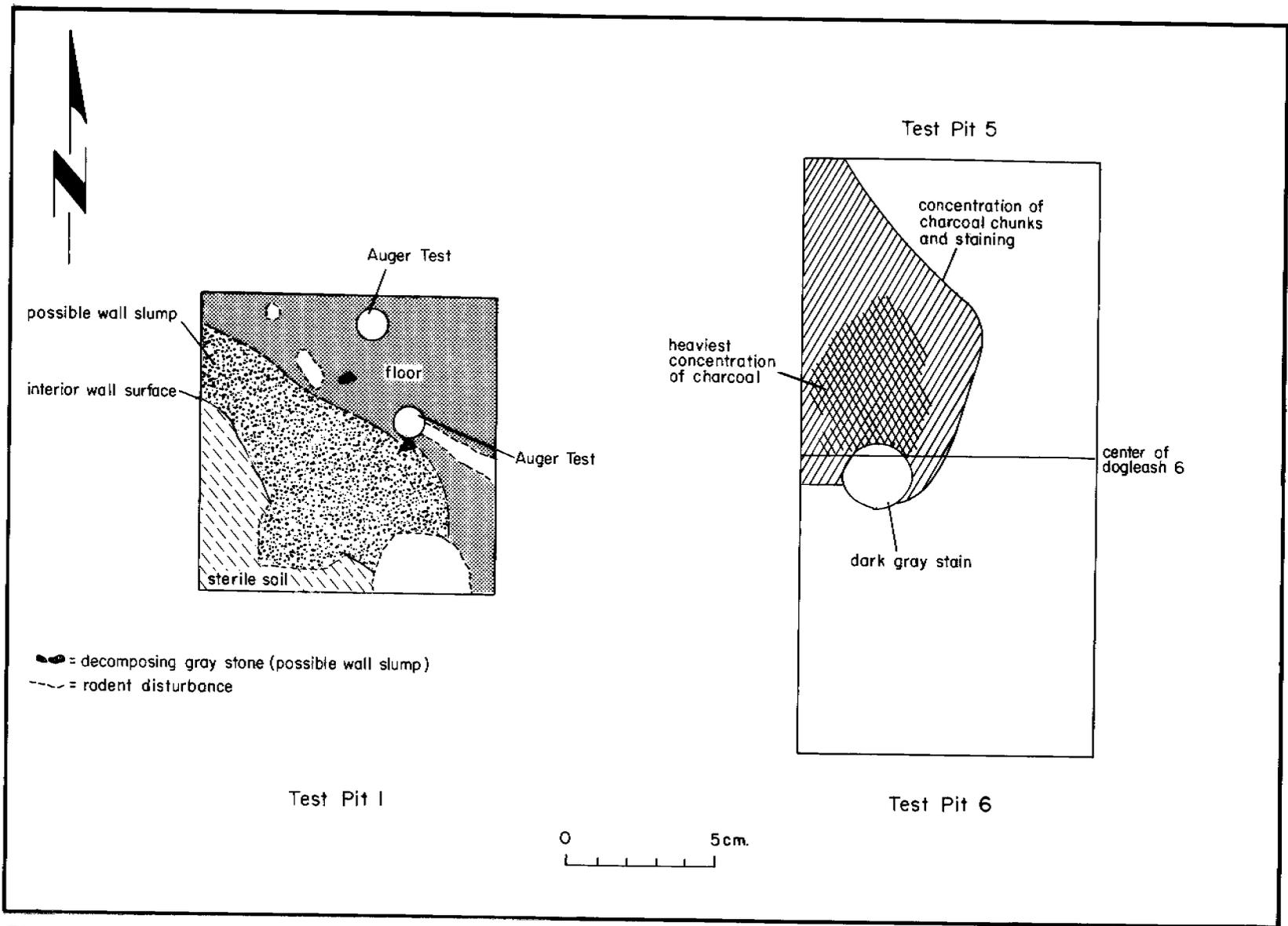


Figure 4. Plan views, Test Pits 1 and 6, LA 71726

directions. Charcoal and dark soil were found in all four tests, from about 20 to 30 cm below surface. By about 45 cm below surface, the soil was sterile.

Test Pits 2, 3, and 4 were culturally sterile below Level 3. Level 1 was loose eolian sand for the first 5 cm, followed by 5 cm of more compacted light brown sand. Level 2 was a reddish brown clay stratum, continuing into Level 3. Artifact counts were high in Level 1, but dropped off substantially in subsequent levels. Auguring at the base of Level 2 or 3 revealed culturally sterile fill below this depth, and powdery pinkish tan sand mixed with caliche at about 50 cm below surface.

Dogleash collection units were placed artifact concentration areas. Additional factors also influenced the placement of DL-2 and 4. DL-2 (with corresponding Test Pit 2) was placed adjacent to the fence line on the south side of the highway in only a moderate artifact concentration because the area across the fence looked like a likely spot for subsurface features. This was an open, flat bench above a drainage. The collection unit/test pit was located here in the hope of encountering subsurface features, and also to compare the findings of this test pit with those that were in high artifact density dogleashes. DL-4 was adjacent to the fence line on the north side of the highway and encompassed a small fire-cracked rock area. As mentioned above, the test pits corresponding to these dogleashes (Test Pits 2 and 4) proved sterile. Table 6 presents artifact counts from the dogleash sample units.

Surface collection accounted for approximately 10 percent of the area of the artifact scatter within the right-of-way.

Table 6. Artifact Frequencies from Dogleashes, LA 71726

Dogleash	Ceramic Artifacts	Lithic Artifacts	Total
1	77	47	124
2	19	12	31
3	60	45	105
4	77	43	120
5	50	39	89
6	43	21	64
TOTAL	326	207	533

The auger transects showed that the stratigraphy throughout the site was mostly consistent with the stratigraphy revealed in auguring the test pits. A reddish-brown clayey-sand stratum, which extended from 5 to 60 cm below surface, overlay a 10-20 cm thick layer of loose, brown sand. Below this, beginning at 60-80 cm below surface, was a stratum of fine, powdery, pinkish tan sand mixed with caliche. No artifacts were

encountered in the auger transects. The only artifacts brought up from auguring were from the series of tests that defined the limits of Feature 1.

Ceramic Artifacts

A total of 697 sherds were examined from LA 71726. Table 7 presents ceramic types and frequencies.

Table 7. Ceramic Types and Frequencies from LA 71726

Ceramic Type	Unknown Vessel Form	Jar	Bowl	Total
Smoothed brown ware	641	10	15	666 (95.5%)
Red-slipped brown ware			1	1 (0.1%)
Jomada (?) bichrome		1		1 (0.1%)
Mogollon Red-on-brown			1	1 (0.1%)
Red-fired brown ware	3			3 (0.4%)
Red Mesa Black-on-white	2	7	1	10 (1.5%)
Puerco/Escavada Black-on-white		2	1	3 (0.4%)
Undifferentiated Cibola White Ware	3	6	2	11 (1.7%)
Mimbres Boldface Black-on-white			1	1 (0.1%)
TOTAL	649 (93.1%)	26 (3.7%)	22 (3.2%)	697 (100.0%)

Like LA 81606, brown wares dominate the ceramic assemblage (95.5 percent). Based on Marshall and Walt's (1984) description of the Tajo phase, LA 71726 fits within this phase (A.D.800-1000). There is enough diversity of types, though the frequencies are low, to place this site within the middle part of the Tajo phase, roughly A.D. 850-950. The ceramic assemblage is similar to the assemblage at Taylor Draw (Peckham 1976), where plain brown pottery comprised 90 to 100 percent of the sample. The only intrusive white ware found was Red Mesa Black-on-white, in very low frequencies, and Mimbres Black-on-white, which may indicate a later reoccupation of the site. Peckham's tree-ring dates from the excavated pithouses range from A.D. 769 to 979. The average span is A.D. 825-944, making it contemporaneous with LA 71726.

Lithic Artifacts by James Moore

A total of 449 lithic artifacts was recovered from LA 71726. Locally available silicified siltstones dominated the assemblage, comprising 84.2 percent (Table 8). Two varieties were noted; the most common was gray, weathering to a very pale brown. Laumbach and Kirkpatrick (1985:41) indicate that this material originates in the Yeso formation, outcropping below the limestone cap of Chupadera Mesa. It ranges in texture from quartzitic siltstone to chert, and many analyzed specimens contained chert lenses in a fine-grained quartzitic matrix. The second variety was a red siltstone or quartzitic siltstone, which probably originates in the Abo formation (Laumbach and Kirkpatrick 1985:41). Only three examples of the latter were noted. Undifferentiated cherts were the second most common material, comprising 9.6 percent of the assemblage. Most probably came from the silicified siltstones of the Yeso formation. Limestone (2.4 percent), undifferentiated igneous rocks (1.8 percent), quartzitic sandstone (1.3 percent), and rhyolite (.7 percent) were found in small quantities. Cortex was waterworn on only three of 141 cortical specimens of silicified siltstone, the rest exhibited no evidence of transport by water. This suggests that most of this material was obtained at or near the source, rather than in water-transported gravel deposits. Other materials were also procured in primary rather than secondary deposits--except for a piece of quartzitic sandstone, no cortex on other materials was waterworn.

Table 8. Artifact Type by Material Type, LA 71726

Material	Core flake	Angular debris	Core	Scraper	Projectile point
chert	25	14	1	-	3
silicified siltstone	309	67	1	1	-
limestone	8	3	-	-	-
rhyolite	2	1	-	-	-
quartzitic sandstone	6	-	-	-	-
igneous undiff.	4	3	1	-	-
totals	354	88	3	1	3

Debitage at LA 71726 was produced using a simple core-flake reduction strategy. Secondary core flakes comprised 83 percent of the flake assemblage, while primary core flakes made up 17 percent. Most flake platforms were simple and unmodified, and only two were altered by abrasion (Table 9). Both of these flakes were struck from cores rather than tools and it is likely that core platforms were sometimes modified to facilitate flake removal. Though flakes with multifacet platforms were

Table 9. Flake Platform Information, LA 71726

Platform type	Number	Percent
cortical	45	12.7
single facet	115	32.0
multifacet	70	19.8
multifacet and abraded	2	.6
collapsed	44	12.4
crushed	2	.6
absent (snap)	37	10.5
absent (BIM*)	39	11.0

* broken in manufacture

common, they were struck from multidirectional cores rather than tools. Four pieces of debitage had evidence of thermal alteration, but in all cases it appeared to be accidental.

Both formal and informal tools were found, but were uncommon. Formal tools included a silicified siltstone side scraper and three chert projectile points that probably date to the early ceramic period. The projectile points were small, triangular, and corner notched, with long blades. Only one informal tool--a marginally retouched silicified siltstone flake--was identified.

The preponderance of expediently produced core flakes, lack of large unspecialized bifaces, and lack of debitage removed from bifaces suggests that the site was occupied by a sedentary rather than mobile population (Kelly 1988). Unweathered silicified siltstone is gray, while weathered examples are very pale brown and often eroded. Subsurface artifacts generally had unweathered surfaces, while those found on the surface were visibly altered. It is probable that weathered silicified siltstone artifacts in test pits were once exposed on the surface and later buried by natural processes like rodent burrowing and frost heave. Thus, the presence of weathered artifacts in subsurface deposits is an indication of disturbance. Only 1 of 203 artifacts recovered below Level 1 in Test Pit 1, and 1 of 33 in Test Pit 4 were weathered. This suggests that these areas are not badly disturbed by bioturbation. Six of 20 artifacts below Level 1 in Test Pit 3, and 2 of 6 in Test Pit 5 were weathered, suggesting that those areas are disturbed. Further examination of these zones during data recovery will provide information that will allow these conclusions to be evaluated.

RECOMMENDATIONS

Testing demonstrated that LA 81606 is a dense ceramic and lithic artifact scatter, with the highest density area outside of the right-of-way on the south side of the highway. The high number of surface artifacts, and possible buried structures, can yield important information on local prehistory. However, the portion of the site within the right-of-way contains a much lower artifact density, and the only subsurface feature found was a small ashpit, probably associated with features outside of the right-of-way. We do not believe that the portion of the site within the right-of-way has the potential to yield important information on prehistory, and no further archaeological work is recommended for this portion of the site.

Testing demonstrated that LA 71726 contains a surface ceramic and lithic artifact scatter, associated with buried deposits. The site portion within the right-of-way at LA 71726 has the potential to yield important information on local prehistory, especially issues of seasonality, subsistence, and regional phase sequences. This portion of the site includes at least one probable pithouse and at least two additional features of unknown function. If the proposed construction takes place, we recommend that a data recovery program be carried out at the portions of LA 71726 within the right-of-way.

DATA RECOVERY PLAN

Very little work has been done in the project area and is discussed in the Cultural Overview section. Numerous surveys have been conducted to the south, on White Sands Missile Range (Shields and Laumbach 1989; Sale 1988; Shields 1987; Laumbach 1986; Clifton 1985; Laumbach and Kirkpatrick 1985), but only one site in the project vicinity has been excavated. Therefore, comparative data is sorely lacking. Peckham (1976) excavated LA 6565 at Taylor Draw, 9.6 km (6 miles) east of LA 71726. Four Tajo phase pithouses and a kiva were excavated, providing our only local comparative study. Oakes (1986) excavated LA 45884, 50 km (31 miles) to the west. Five Tajo phase pit structures were excavated, three of which were definite habitation units, while two may have been used for storage. LA 45884 was a habitation and storage site that was occupied year-round based on the presence of storage features and interior hearths. The inhabitants apparently practiced a wild food gathering and hunting subsistence economy, with some dependence upon stored goods, and produced a well-made brown ware pottery. Although LA 45884 is farther away from LA 71726, both of these sites can provide important comparative information on site function, seasonality, and subsistence.

Phase sequences also need to be evaluated at LA 71726. As discussed in the Cultural Overview section, the project area is surrounded by four different regional phase sequences, and is just outside what Lehmer (1948) has described as the Jornada Branch of the Mogollon. The sequence chosen for comparative purposes for this project is from the Rio Abajo. Here, the ceramic period begins with the San Marcial phase (A.D. 300 to 800), followed by the Tajo phase (A.D. 800 to 1000) and the Elmendorf phase (A.D. 950 to 1300). Based on ceramic typologies, LA 71726 appears to be affiliated with the Tajo phase. Marshall and Walt (1984) have defined this phase in detail; their information, however, is based wholly on survey. Therefore, information obtained from LA 71726 can add to our knowledge of regional phase sequences. Because LA 6565 and LA 45884 are the only Tajo phase sites that have been excavated, *any* information from LA 71726 will add to our data base from this period. Specific issues can be examined, such as variation in architectural and ceramic styles between the Rio Abajo region and the project area, and to what degree subsistence and settlement patterns vary during the Tajo phase.

While important information can be learned from excavation at LA 71726, the questions we can ask are determined by the nature of the site and the lack of comparative data. From data gained during the testing phase, LA 71726 may be a limited activity site, indicated by the small number of features and the lack of midden deposits. Therefore, our research objectives are aimed at providing baseline data on site function, seasonality, and subsistence.

Research Questions

1. *What was the function of the site, and was it occupied seasonally or year-round?*

The two possible functions for the buried feature at LA 71726 are habitation or storage. Several criteria will be examined, such as feature size, presence or absence of hearths, presence or absence of post holes, and artifact type and density. The presence of interior features would indicate a habitation; absence of these features, coupled with small feature size and a low number of artifacts, would indicate either a storage feature or a seasonally occupied habitation.

Several differences are expected when differentiating between a permanent and a seasonal occupation of a site, as discussed previously by several researchers including Lancaster (in Vierra and Lancaster 1987:15-16), Binford (1978), B. Moore (1978), Adams (1978), J. Moore (1989), Preucel (1990), and James (1990). The following model is abstracted from Lancaster (1987).

A) Food storage facilities, such as subsurface pits, surface rooms, and large storage vessels would be found at sites occupied on a year-round basis. A seasonally-occupied site would not need extensive storage facilities.

B) Extensive food-processing facilities, such as mealing bins, would be expected at sites occupied year round.

C) Sites occupied only during the summer would have outdoor hearths and activity areas, while year-round sites would have indoor hearths.

D) A greater amount and diversity of artifacts would be expected at a year-round site. Artifacts would reflect a broader range of activities, such as axes or mauls, hoes, bone awls, a variety of chipped and ground stone artifacts, and ritual objects. In addition, larger and more varied trash deposits would be expected.

E) Floral and faunal remains reflect the season of occupation at a site. Therefore, a seasonally occupied site would yield evidence only of remains that could have been collected during the season the site was occupied. A site occupied year-round would have a greater diversity of remains.

From the data gained during the testing phase, LA 71726 seems to have been seasonally occupied. No other subsurface features were found that could be food storage pits, other than Feature 1. The lack of a substantial midden suggests a short-term occupation. No ground stone or agricultural implements, indicators of food processing and varied activities, were found. Features 2 and 3 may be extramural hearths or activity areas, also an indication of a seasonally occupied site.

To address this question, all of Features 1, 2, and 3 will be excavated. If Feature 1 is a pitthouse, we will look for subsurface and extramural storage features. Pollen and flotation samples will be taken in association with any ground stone that is recovered

to ascertain seasonality. If there are no floor or subsurface features present, a determination of site function will be based on comparative studies, combined with field data. Auguring and surface stripping around the features (discussed in the following chapter) will be used to search for any additional buried features.

2. If the feature at LA 71726 is a pit structure, how does it compare to other known pit structures in the area?

Because LA 6565 and LA 45884 (Peckham 1976; Oakes 1986) are the only excavated pit structures in the project vicinity, detailed comparisons will be conducted between LA 71726 and these sites. LA 6565 is only 9.6 km (6 miles) to the east; LA 45884 is 50 km (31 miles) west. Four pithouses were excavated at LA 6565. Two were round and two were oval/rounded to rectangular. Two were shallow (less than 1 m deep) and two were over 1 m deep. All had a four-post roof support system, and all had a central hearth. None of the pit structures had subfloor storage pits (Peckham 1976). These traits, as well as other characteristics such as orientation of ventilator, type of entry, and floor area, will be compared to LA 71726 (providing the feature at LA 71726 is a pithouse). Besides adding to the understanding of the area, this may indicate a relationship between LA 6565 and LA 71726, not unlikely based on their proximity.

Five pit structures were excavated at LA 45884, three of which were definite habitation units, while two may have been used for habitation or storage. Habitation units were determined by artifact diversity, internal hearths, and associated surface debris. A possible storage function was indicated by lack of internal features and low artifact density, though these same factors could also indicate a summer occupation (Oakes 1986:19). At this site, the three habitation units were round and the two possible storage units were oval. Dimensions varied from 2 to 4 m in diameter, and depth varied from 0.3 m to 1.3 m. Again, these characteristics, along with floor preparation, post hole pattern, and presence or absence of hearths, will be compared to LA 71726. Although LA 45884 is farther away than LA 6565, it may ultimately prove more useful for comparative purposes if the feature at LA 71726 turns out to be a storage unit rather than a habitation.

Though considerable work has been done in the Sacramento Mountains to the east (Kelley 1984; Vierra and Lancaster 1987; Farwell and Oakes n.d.), these pit structures are all later than preliminary ceramic analysis indicates at LA 71726. If, however, absolute dates are obtained from LA 71726 that more closely approximate these Glencoe phase sites, they will be used for comparative studies.

Excavation of the whole pit structure is necessary to answer this question. If it served as a habitation, it will be compared to LA 6565 and LA 45884. Internal features will be recorded and used to compare LA 71726 to these previously recorded pit structures. A comparative study may include post hole pattern, hearths, orientation of ventilator, type of entry, shape and depth of the pit structure, and floor area.

3. What was the basic subsistence pattern at the site? Were the inhabitants farmers?

Again, floral and faunal remains are expected to help answer this question. The La

Fonda soil association, which occurs around LA 71726, are deep, well-drained soils, and suitable for agriculture. The site location itself is conducive to farming, in a flat to gently sloping plain. There is no permanent water source nearby, but intermittent streams border the site on two sides and flow during summer storms.

At nearby LA 6565, Peckham (1976:62-63) found evidence for an agricultural and hunting economy. The arable land in the valley bottoms, the presence of numerous surface granaries, and the occurrence of corn all point to farming as an important element in local subsistence. The frequency of projectile points indicated the hunting of wild game. Various forms of wild foods were plentiful in the area, such as piñon nuts, yucca fruit, and prickly pear.

During the testing phase at LA 71726, burned corn and several projectile points were recovered, thus already providing the potential for a mixed agricultural and hunting subsistence economy. Analysis of pollen, phytolith, and botanical samples will shed more light on the question of subsistence at LA 71726.

Several lines of evidence will be looked at to address this question. Analysis of botanical and faunal remains can determine whether food sources were domesticated or wild. Faunal analysis will aid in determining hunting patterns and show how large a role hunting played in the subsistence economy (discussed in the next section--Field and Analytic Methods). Off-site pollen samples will be collected from within the proposed project boundary to look for evidence of prehistoric agriculture. Ground stone analysis can provide information on types of plants being processed, and types of wear observed on tools during lithic analysis can provide information on activities that occurred at the site.

4. Will excavation of LA 71726 aid in defining the age, characteristics, and geographic delineation of the Tajo phase?

LA 71726 is in the northwest corner of the Jornada Mogollon region. Very little archaeological investigation has been done in this area. In the last decade, Human Systems Research has conducted numerous surveys of large tracts of land on the White Sands Missile Range to the south, greatly adding to our archaeological knowledge of that area. Yet to the north into the foothills of Chupadera Mesa, and to the east and west, virtually no work has occurred. The exceptions are Peckham's (1976) excavations at Taylor Draw (LA 6565) and Oakes's (1986) excavations at the Fite Ranch site (LA 45884), both Tajo phase sites and thus relevant to this project.

Consequently, the Tajo phase, with which the site so far seems affiliated, is not well known. Marshall and Walt's (1984) survey of the Rio Abajo region was confined to the riverine area, and did not extend into the Jornada del Muerto. Their information was derived wholly from survey. Thus, excavation of LA 71726 may further define the age and characteristics of the Tajo phase, particularly when compared to data collected at LA 6565, and aid in delineating the eastern boundary of this phase.

Chronometric data gathered from LA 71726 will help refine dates for this phase. Charcoal for Carbon-14 dating was collected during the testing phase of this project,

and more will be collected during data recovery. If we find hearths, archaeomagnetic samples will be collected, and appropriate wood sample will be collected for dendrochronological studies.

Information on seasonality and agriculture, addressed in Questions 1 and 3, will add to our knowledge of the Tajo phase. Additionally, data gained from excavation of LA 71726 may contribute to our understanding regarding patterns of settlement, mobility, and exchange during this time.

FIELD AND ANALYTIC METHODS

Excavation Methods

Because of the research orientation and the small number of features likely to be found at LA 71726, the proposed research questions will require investigation of all features within the project right-of-way. No work will be conducted on the portions of the site outside of the existing right-of-way, as these areas will not be disturbed.

The first step in excavation will be establishing a baseline for a grid system, which will be used to define excavation units. This will be done from the existing site datum used for mapping during the testing phase. The baseline will tie into Test Pit 1, where the possible pit structure is located. Excavation units will be 1 by 1 m squares.

Excavation will be expanded out from the units excavated during the testing phase to determine the nature and extent of the cultural deposits encountered. Grids will be excavated over the auger holes that yielded subsurface cultural material during testing. Excavation will proceed in 10 cm levels until the stratigraphy is defined, at which time levels will be dug according to strata. Although Test Pit 1 was excavated to a depth of 1 m, the stratigraphy and level at which the top of the wall (Feature 1) appeared was not readily apparent and therefore, proceeding by levels will be the preferred method until further clarification can be made. Excavation of features will continue until sterile soil is encountered.

Surface-stripping will be used around Test Pits 5 and 6 (Feature 2) to attempt to define any similar cultural features that are not visible from the surface. Auguring did not indicate subsurface deposits, but in the case of shallow, ephemeral cultural layers, such as an activity surface, surface-stripping can provide a more detailed view than the auger, and help define site function (see Research Question 1).

The general strategy just described should allow us to define the site structure and features required to address Research Questions 1, 2, and 4.

All soil from excavated grids will be screened through ¼" mesh hardware cloth, and all artifacts will be collected and bagged for analysis. Types and amounts of artifacts found will provide information relative to length of occupation of the site, and subsistence patterns (Research Questions 1 and 3). Artifacts found on floors or other occupational surfaces will be mapped in place and bagged separately. All artifacts will be bagged and labeled by unit, stratigraphic or arbitrary level, date, and excavator's name. A specimen number will be assigned to all bags (all bags from the same level of a provenience will be given the same number) and a field artifact catalog will be maintained.

Pollen and flotation samples will be collected from all prehistoric cultural strata, and from the surfaces of any floors or occupational surfaces encountered. An off-site

pollen control sample will be collected to aid in analysis. Analysis of these specimens will help identify seasonality and subsistence patterns (Questions 1 and 3). Charcoal, tree-ring, and archeomagnetic samples, when available, will also be collected to further aid in identifying the period of occupation (Question 4). Sample locations will be plotted on plan and profile maps of features and proveniences. The sample bags will be labeled and recorded in the same manner as artifact bags. In the case of hearths or storage pits, half of the feature will be excavated to determine depth and stratigraphy. Ethnobotanical and carbon-14 samples will then be collected from the best strata when the rest of the feature is excavated.

Locations of all features will be tied into the existing stadia site map using a transit and stadia rod or 30 m tape. Upon excavation of features, photographs will be taken, plan and profile maps drawn, and elevations tied into the site map. Notes will be kept for each feature, documenting location, depth, description of fill and artifacts, and interpretation. Upon completion of excavation of all features, the site will be back-filled.

It is unlikely that human remains will be found at LA 71726. However, if remains are found, field treatment of human remains and other sensitive materials will be based on the Museum of New Mexico policy adopted March 20, 1986, entitled "Collection and Display of Sensitive Materials" (SRC Rule 11), and modified January 17, 1991. This policy is outlined in Appendix 3.

Laboratory Methods

Prior to artifact analysis, all recovered materials will be cleaned, and any materials requiring conservation will be treated. Samples collected for ethnobotanical studies, as well as any charcoal and dendrochronological samples, will be processed and prepared for shipment to the appropriate laboratory. Specialists will be consulted for special preparations required prior to shipment. Copies of field maps and feature drawings will be sent to the analysts.

Analysis of artifacts will be keyed to the research questions. For example, the absence of large storage vessels would suggest a seasonally occupied site rather than a permanent habitation (large storage vessels are considered food storage facilities, which are expected at permanent habitation sites, discussed in Question 1). We will also look for indications of ceramic trade versus local manufacture by examining temper, and attempt to pinpoint manufacturing locations by petrographic and thin section analysis (the two latter processes to be conducted by a specialist). This may give us a better understanding of population movement during the Tajo phase, of which little is known (Question 4). Other attributes to be looked at are vessel form, slip color, paste color and texture, rim form and cross-section, design style, thickness, and alterations such as exterior burning, interior smudging, mending holes, and worked edges (Question 1). A binocular microscope will be used for analysis.

Attributes that will be studied on lithic artifacts include material type and texture, artifact type, and alterations like thermal treatment, incidental breakage, and use. A binocular microscope will be used to identify retouch and wear patterns related to both formal and informal tool use. Attributes to be studied on tools include edge angle and shape, and type of modification and/or wear. Debitage will be examined for evidence of reduction strategy, and several related attributes including reduction stage, platform type and modifications, percentage of dorsal cortex, platform lipping, artifact portion, direction of dorsal scarring, and size, will be recorded. These studies should allow an evaluation of reduction technology, tool production and use, and raw material procurement strategies (Moore 1989:45) for the Tajo phase. The analysis may supplement information on site function and seasonality (Question 1), subsistence (Question 3), and add to a basic understanding of the Tajo phase (Question 4).

Faunal analysis will aid in understanding subsistence and seasonality at the site (Questions 1 and 3). Analysis will be directed at identification of species and age. From this information, other factors can be examined, such as hunting patterns, to what extent hunting was a necessary part of the occupants' subsistence, and the season of occupation. Data concerning the use of faunal material as tools will also be studied.

Laboratory analysis of pollen and ethnobotanical samples will be conducted by the Castetter Laboratory for Ethnobotanical Studies, Department of Biology, University of New Mexico. The analysis will be designed to attempt prehistoric environmental reconstructions, identify plant resources that were used prehistorically, and help determine subsistence and seasonality (Questions 1 and 3).

Radiocarbon dating will be conducted by Beta Analytic, Inc., of Coral Gables, Florida. Archeomagnetic analysis will be conducted by Daniel Wolfman, on staff at the Office of Archaeological Studies. The purpose of these analyses will be to obtain the most accurate range of dates possible for cultural strata and features (Question 4).

Research Results

The final data recovery and analysis report will be published in the Museum of New Mexico's *Archaeology Notes* series. The report will present all important excavation, analysis, and interpretive results, including a comparative study of pit structures under Question 2, photographs, maps, and tables. Field notes, maps, analytic notes, and photographs will be housed at the Archaeological Records Management System of the State Historic Preservation Division, located at the Laboratory of Anthropology in Santa Fe. The artifact collection will be curated at the Museum of New Mexico's archaeological repository.

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APPENDIX 2.

Polythetic Set for Defining Biface Flakes

Whole Flakes

1. Platform:
 - a. has more than one facet
 - b. is modified (retouched and/or abraded)
2. Platform is lipped.
3. Platform angle is less than 45 degrees.
4. Dorsal scar orientation is:
 - a. parallel
 - b. multidirectional
 - c. opposing
5. Dorsal topography is regular.
6. Edge outline is even.
7. Flake is less than 5 mm thick.
8. Flake has a relatively even thickness from proximal to distal end.
9. Bulb of percussion is weak (diffuse).
10. There is a pronounced ventral curvature.

Broken Flakes or Flakes with Collapsed Platforms

1. Dorsal scar orientation is:
 - a. parallel
 - b. multidirectional
 - c. opposing
2. Dorsal topography is regular.
3. Edge outline is even.
4. Flake is less than 5 mm thick.
5. Flake has a relatively even thickness from proximal to distal end.
6. Bulb of percussion is weak.
7. There is a pronounced ventral curvature.

Artifact is a Biface Flake When:

- If whole it fulfills 7 of 10 attributes.
- If broken or platform is collapsed it fulfills 5 of 7 attributes.

APPENDIX 3

STATEMENT OF PROPOSED TREATMENT OF HUMAN REMAINS AND OTHER CULTURALLY SENSITIVE DISCOVERIES

It is unlikely that human remains will be found at LA 71726. However, the following guidelines will apply if remains *are* found. The Office of Archaeological Studies' treatment of human remains is based on the Museum of New Mexico's policy adopted on March 20, 1986, and modified on Jan. 17, 1991, Entitled "Policy on Collection, Display, and Repatriation of culturally Sensitive Materials" (SRC Rule 11). This policy stated, in part:

Archaeological activities of the Museum of New Mexico often result in the recovery of potentially sensitive cultural materials. The recovery and documentation of such materials will attempt to balance the imperatives of the scientific research and cultural resources management with the religious and spiritual concerns of living people. Human remains, sacred objects, and other sensitive material will be treated with respect.

Whenever possible and without compromising scientific research objectives, living groups with legitimate historical relationships to sites, human remains, and sacred objects will be consulted about the proper care and handling of sensitive materials. The Museum of New Mexico reserves the right to restrict public access to ongoing archaeological excavations if, in the judgement of the field supervisor, such access poses a threat to scientific data recovery or the religious and spiritual concerns of living people.

During the current project, the following steps will be taken:

1. If human remains or other culturally sensitive remains are uncovered, no person will be allowed to handle or photograph those remains except as part of archeological data recovery efforts. Data recovery related photographs will not be released to the media of general public.

2. In the event that sensitive remains are recovered in a context indicating a definitive link to a specific living pueblo or tribe, the governing body of the pueblo or tribe will be contacted, informed of the nature and circumstances of the discovery, and asked to provide consultation on the subsequent handling and disposition of the remains. To the degree possible without compromising scientific research needs and legal restrictions, the wishes of the living pueblo or tribe will be honored.

3. In the event that sensitive remains are recovered but are not traceable in specific or general terms to any living human group, they will be treated in accordance with the general museum policy stated in SRC Rule 11. Human remains of this kind will be turned over to the forensic facility of the University of New Mexico, as part of standard Office of Archaeological Studies practice, where they will be preserved in

perpetuity. Should later circumstances allow an identification of a descendant group or groups, consultation with the appropriate group and possible modification of the disposition can be conducted at that time.