MUSEUM OF NEW MEXICO

TESTING RESULTS AND DATA RECOVERY PLAN FOR THE CARLSBAD RELIEF ROUTE, EDDY COUNTY, NEW MEXICO

DOROTHY A. ZAMORA

OFFICE OF ARCHAEOLOGICAL STUDIES

ARCHAEOLOGY NOTES

MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

TESTING RESULTS AND DATA RECOVERY PLAN FOR THE CARLSBAD RELIEF ROUTE, EDDY COUNTY, NEW MEXICO

by
Dorothy A. Zamora

Contributions by
David J. Hayden
Yvonne R. Oakes
Regge N. Wiseman

Submitted by
Yvonne R. Oakes
Principal Investigator

ARCHAEOLOGY NOTES 219

SANTA FE 1997 NEW MEXICO

ADMINISTRATIVE SUMMARY

A limited testing program was conducted December 16-20, 1996, and January 21-25, 1997, by Office of Archaeological Studies (OAS) personnel on four prehistoric sites along the North Loop Road north of Carlsbad, in Eddy County, New Mexico. The limited testing determined the extent and significance of the sites.

The results of the testing show that two sites, LA 29362 and LA 29363, are likely to yield important information on the prehistory of the area. LA 29362 is a possible Archaic lithic scatter and LA 29363 contains several thermal features and possible pit structures dating post A.D. 800. A data recovery plan has been developed for LA 29362 and LA 29363.

Submitted in fulfillment of Joint Powers Agreement J00343/1 between the New Mexico State Highway and Transportation Department and the Office of Archaeological Studies, Museum of New Mexico

BLM Permit 21-2920-96T
MNM Project No. 41.6411
NMSHTD Project No. SD-WIPP-7615(206) CN 2231

TABLE OF CONTENTS

Figures

Tables

INTRODUCTION

The New Mexico State Highway and Transportation Department (NMSHTD) proposes to improve County Road 604, as part of the WIPP Route (NMSHTD No. SD-WIPP-7615[206], CN 223) in Eddy County (Fig. 1). The limited testing was requested by Mr. William L. Taylor, environmental program manager of NMSHTD, to determine the research potential and significance of the sites.

The field crew consisted of Dorothy A. Zamora, project supervisor, Lloyd Moiola, Dave Hayden, and Jim Quaranta. Yvonne R. Oakes served as the principal investigator for the project. Eric Dillingham of the Bureau of Land Management (BLM), Carlsbad District, served as BLM contact. A total of 10 person-days were spent in the field and 16 person-days were spent in research and report preparation. Dave Hayden, Lloyd Moiola, and Yvonne Oakes assisted in the report preparation.

Four prehistoric sites were tested. LA 29362 and LA 78119 are on highway right-of-way acquired from private sources and have BLM mineral rights. LA 29363 and LA 79978 are on BLM lands (Table 1). One site, LA 78119, was previously recorded as a lithic artifact scatter with six fire-cracked rock concentrations. The testing program did not reveal any subsurface cultural materials on this site and few surface artifacts were recovered. Four out of the six fire-cracked rock concentrations were tested, the fifth was outside the right-of-way corridor, and the sixth was never relocated. LA 78119 contains no further information important to the prehistory of the area.

A data recovery plan has been prepared for LA 29362 and 29363. LA 29363 and LA 79978 have been combined into one continuous site, LA 29363. These two sites have the potential to yield information important to the prehistory of the area.

Table 1. Site Land Status and Testing Results

Site	Ownership	Site Size (m)	Acreage		Testing Results
			Acres	Hectares	
LA 29362	Private (BLM Mineral rights)	250 by 500	30.89	12.50	Data Recovery
LA 78119	Private (BLM Mineral rights)	117 by 70	2.02	.82	No further work
LA 29363* LA 79978*	BLM	337 by 213	17.74	7.18	Data Recovery

* Sites combined.

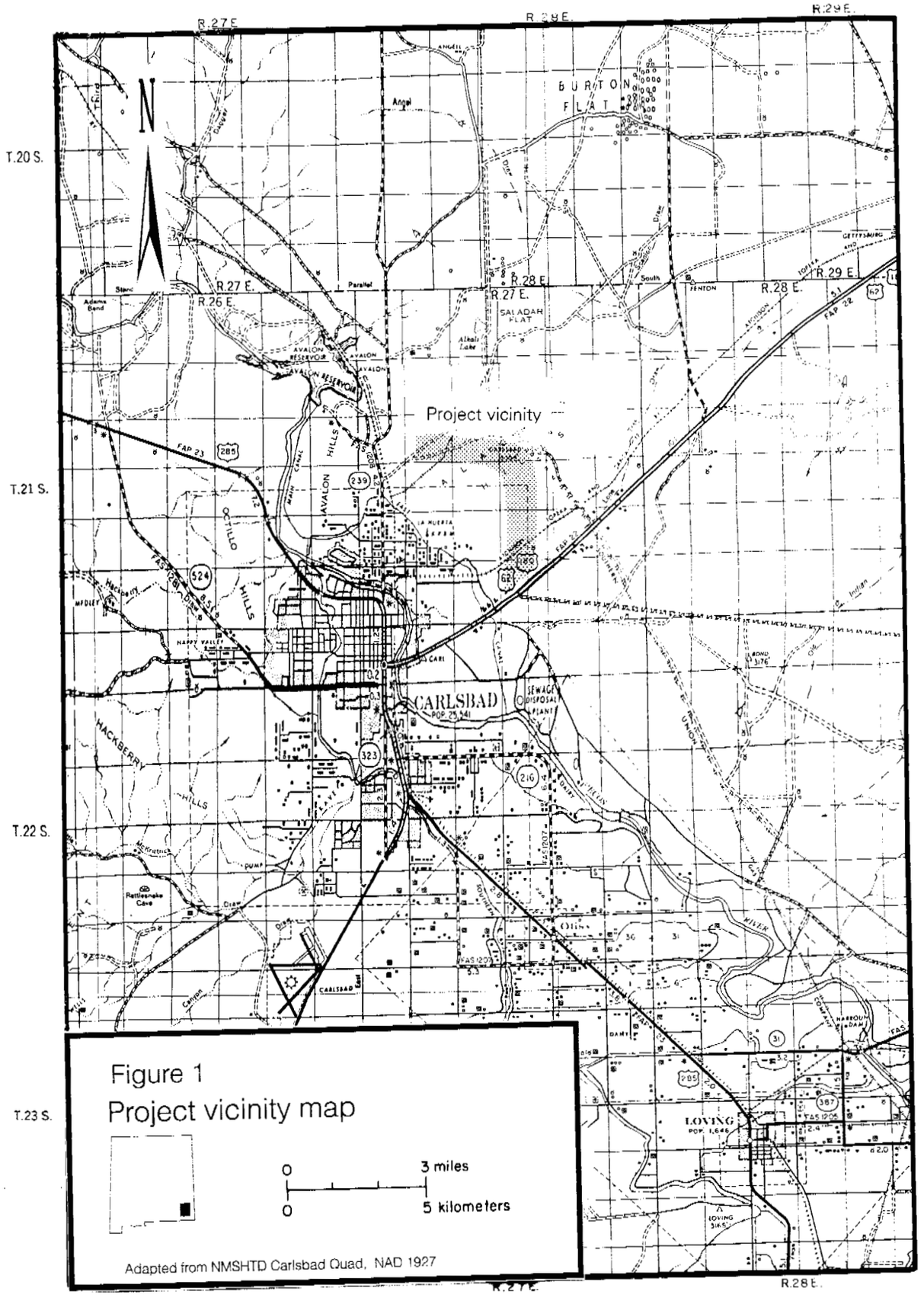

Figure 1
Project vicinity map

ENVIRONMENT

David J. Hayden

Physiography

The project area is situated in a peninsular wedge of the Chihuahuan Desert biozone that extends north from the New Mexico-Texas border and is bounded to the east and west by the Llano Estacado (Staked Plains) and the Guadalupe Mountains respectively (Medellin-Leal 1982). As the most dominant physiographic feature in the area, the Pecos River bisects the region, creating locally unique ecozones dependant on riverine environments. With the exception of the Pecos River, the project area is devoid of perennial water sources, and is cut by water courses active only during severely wet weather.

Local geology is defined by Permian Age *San Andreas Limestones* of the Rustler Formation (Dane and Bachman 1965), with extensive gypsum and anhydrite beds along the Pecos River. Associated derivative soils in the project area are Gypsiorthids-Torreothents-Gypsum Land and Paleorthids-Haplargids (Maker et al. 1974), and are primarily manifested in thin eolian layers 10-80 cm deep over bedrock bases and broken caliche beds. Additional eolian deposits of fine-grained Pecos River alluvium are locally aggregated into active or dormant dune systems in which depths above bedrock can reach 5 m (Maker et al. 1974).

LA 29362 and LA 78119 both fall into the former of these depictions, with average soil depths under 1 m; conversely, LA 29363 is dominated by active dunes measuring up to 3 m in height.

Flora and Fauna

The majority of the locally sparse vegetation is associated with the Chihuahuan Desert ecozone, and consists of alkali sacaton, sand dropseed, gyp dropseed, gyp gramma, fluffgrass, coldenia, chamisa, black grama, sideoats grama, little bluestem, three awns, bush muhley, winterfat, mesquite, creosotebush, and tarbush, broom snakeweed, and long-leaf ephedra. Some areas, particularly near LA 29363, support small stands of piñon and juniper.

Fauna includes pronghorn, cottontail rabbit, jackrabbit, as well as numerous small rodents. An additional myriad of fauna associated with riverine and wetland environments 2 to 3 miles away provide additional diversity, including several species of turtle, fish, and migratory birds. Until the late nineteenth century, the Pecos River served as the western boundary of the Great Plains bison herd range.

Climate

The local climate of today is characterized by mild winters and hot summers, with a mean January temperature of 5.1° C and a mean July temperature of 26.3° C; the yearly mean

temperature is approximately 15.9° C with and average frost-free season of more than 200 days (Tuan et al. 1973). Summer-dominant precipitation patterns result in a mean annual amount of 305 mm, 203 mm of which falls between April and September (US Department of Commerce 1965; Tuan et al. 1973).

CULTURAL SETTING

Regge N. Wiseman

The following culture-history outline of southeastern New Mexico is distilled from a number of sources. Sources for the prehistoric period include Stuart and Gauthier (1981; a general study of New Mexico archaeology), Sebastian and Larralde (1989; an overview of east-central and southeastern New Mexico), Jelinek (1967; the Pecos River north of Roswell), Katz and Katz (1985a; the Pecos River south of Roswell), and Leslie (1979; the region east of the Pecos River and especially the southeastern corner of New Mexico). The reader desiring more information is referred to those volumes.

Human occupation of southeastern New Mexico began with the Llano complex ("Clovis Man") of the Paleoindian period, which dates at least 13,000 years ago. These people and their successors (Folsom period) hunted large mammals (so-called megafauna, such as mammoths and extinct forms of bison), and maintained a nomadic or seminomadic lifestyle. Although most accounts of paleoindians refer to them as big-game hunters, it is a virtual certainty that the people also collected and consumed wild vegetal foods and hunted small animals.

The retreat of the Pleistocene glaciers and resultant warming of the more southerly latitudes resulted in a shift in human adaptation to what archaeologists call the Archaic period. This hunting and gathering adaptation was evidently more eclectic than the Paleoindian period and focused on smaller animals such as deer and rabbits. The appearance of grinding tools and specialized burned-rock features suggests a greater reliance on plant foods.

In the project area, an Archaic sequence (including hunter-gatherers dating to the pottery period), developed by the Katzes (Katz and Katz 1985a), starts with the Middle Archaic, rather than the Early Archaic, suggesting that there may have been an occupational hiatus between the Paleoindian and the Avalon phase (3000-1000 B.C.). Little is known about the peoples of the Avalon phase other than the fact that they inhabited the floodplain near the river channel during at least part of the year, camped and constructed hearths in the open, and consumed one or more species of freshwater shellfish. The subsistence orientation at these sites was clearly riverine. Projectile points are currently unknown for this phase.

Late Archaic peoples of the succeeding McMillan phase (1000 B.C. to A.D. 1) are better known in that more sites with more artifacts have been documented. Sites contain relatively small hearths (1-m-diameter clusters of small rocks) and burned-rock rings. Previously named projectile point styles associated with the McMillan include the Darl and the Palmillas types. Subsistence involved exploiting both riverine and upland plant and animal species.

The terminal Archaic Brantley phase (A.D. 1 to 750) continued the previous patterns and evidenced a greater use of burned-rock rings. Although this suggests that certain upland resources such as agave and sotol were becoming more important in the diet, the ratio of riverine to upland sites remained the same, with the emphasis still on floodplain living. Projectile point types commonly associated with the Brantley phase include the previously known San Pedro style; a newly described provisional type, the Pecos point; and several less standardized, but nevertheless familiar, styles of points commonly found in the region.

Occupation of the floodplain environment reached its zenith during the Globe phase (A.D. 750 to 1150) in the Carlsbad locale. At this time, four major changes occur--the appearance of pottery, the bow and arrow, and rock habitation structures (the stone circle or piled-rock structure), and a shift in the primary subsistence focus from the riverine system to the uplands. Projectile point styles are dominated by the corner-notched arrow tips called Scallorn. In many ways, the Globe phase appears to have been transitional between earlier and later adaptive patterns.

During the succeeding Oriental phase (A.D. 1150 to 1450), occupation along the river in the Carlsbad area continued to diminish. The people who remained in the area used painted pottery such as Chupadero Black-on-white, Three Rivers Red-on-terracotta, and El Paso Polychrome, imported from areas to the west and northwest. Otherwise, they retained their essentially Archaic, hunter-gatherer lifestyle. Why the local culture of Carlsbad/Guadalupe Mountains region did not continue to develop along the same lines as those to the north and west remains to be determined.

The Phenix phase (A.D. 1450 to 1540) and the Seven Rivers phase (A.D. post-1540) are predicated on projectile point styles only (Garza-like and Toyah-like in the former and metal points in the latter), but Katz and Katz (1985a) admit that distinguishing between the two may be dubious in practice. They were able to assign only one site to each phase, indicating that Native American use of the riverine habitat in the Carlsbad area was minimal, mostly oriented towards hunting and perhaps succulent plant exploitation, and focused mainly (it seems) on Rocky Arroyo.

Where many of the people went, assuming that a diminution of sites and cultural remains indicate at least partial abandonment, also remains to be determined. The period represented by the Phenix and Seven Rivers phases (the latter including the early Spanish explorations in the late 1500s) is unknown archaeologically. Abandoned *rancherias* described by early Spanish explorers for the Seven Rivers region certainly indicate the presence of hunter-gatherers during the protohistoric and early historic periods (Schroeder and Matson 1965), but the inhabitants (possibly Jumanos or Apaches; Hickerson 1994) effectively disappeared as an identifiable people before more detailed accounts and relationships could be recorded.

From Spanish contact until after the American Civil War, roaming Apaches, Comanches, Kiowas, and other Plains tribes kept Euro-American settlement of southeastern New Mexico in abeyance. Following the Civil War, westward mass movement of Euro-Americans and eastward drifting of small groups of New Mexico Hispanics led to settlement of the region. Cattle ranching was the first economic activity, but by about 1890, drought had all but decimated the grasslands. The village of Seven Rivers just east of the project area was founded about 1885, and rapidly became a haven for outlaws escaping justice in Texas. The turn towards law and order was completed when artesian water was discovered at Roswell in 1891, and its development throughout the valley promoted widespread irrigation and a rapid influx of people. The railroad reached Carlsbad in 1891, irretrievably setting the course for urbanization of the area. At the turn of the century, the area's economy became firmly based in agriculture, stockraising, and in the mid-twentieth century, the production of oil and gas.

PREVIOUS ARCHAEOLOGICAL WORK

David J. Hayden

Archaeological research in the project area has been minimal, and restricted primarily to cultural resource management projects associated with oil and gas exploration, public land management, dam construction, and highway construction and upgrades. The majority of the sites recorded in the area are open air and defined by shallow cultural deposits (Wiseman 1996); excavation projects include preparation for the construction of Brantley Dam (Gallagher and Bearden 1980; Katz and Katz 1985a, 1985b), and preparation for highway improvements (Wiseman 1996). Cave and rockshelter excavations include reports by Applegarth (1976), Ferdon (1946), Henderson (1976), Howard (1930, 1932, 1935), Mera (1938), Riches (1968), and Roney (1985).

Two prehistoric-historic cultural overviews have been produced regarding the local context. These include a master's thesis on the Guadalupe Mountain and lower Pecos Valley (Mallouf 1985), and a Bureau of Land Management cultural overview (Sebastian and Larralde 1989).

Several recent projects have been associated with the construction of the Waste Isolation Pilot Project (WIPP) and the related Carlsbad Bypass/North Loop. Lord and Reynolds (1985) excavated three prehistoric sites for WIPP. A partial survey of the proposed bypass route was surveyed by Aylward and Haskell (1981), and included portions of LA 29363. Later, partially overlapping surveys for the proposed North Loop included several sites ranging in age from the late Paleoindian period to the nineteenth century (Hokanson 1996; Phippen 1990). Four of these sites, LA 29362, LA 29363, LA 78119, and LA 79978, are part of the current project. A survey for an alternative proposed route identified twelve sites that also include LA 29362 and LA 78119 (Higgins 1990).

TESTING PROCEDURES

The purpose of the testing program was to determine the nature, depth, and extent of possible cultural deposits existing within the proposed right-of-way. At all sites, testing operations followed general procedures used by the OAS. A primary datum was established for each site and north-south, east-west baselines were laid out with the use of a transit and stadia rod. A 1-by-1-m grid system was superimposed on each site. Test pits, measuring 1-by-1 m, were placed within the grid system in blow-outs and possible features. Excavation in each continued until sterile soil was confirmed.

Artifacts were collected in 10-cm levels and bagged by level. Surface areas around the test pits were collected. Testing was conducted with the use of shovels, picks, trowels, and brushes. All soil was screened through ¼-inch wire mesh screen. Auger tests were placed in the center of each test pit to confirm the presence of sterile soil. Augering was also used to find limits of some features. Cross sections were drawn when stratigraphic layering was visible and photographs were taken of any cultural features found.

A site map was produced using a total station. Topographic variation, site elevations, drainages, roads, test pit locations, site limits, and extent of the proposed right-of-way were plotted on the maps.

After testing, all artifacts were cataloged by provenience and were assigned a field specimen number. Lithic artifacts were analyzed by Lloyd Moiola in the laboratory. The lithic data were then entered into the computer and cross-tabulations were produced using an SPSS program. All artifacts will be reexamined upon conclusion of the data recovery program. We will perform detailed morphological and statistical analyses.

SITE DESCRIPTIONS

Site descriptions and evaluations are provided for each of the four sites examined during the limited testing program. The artifacts were analyzed employing the standard analysis forms used at OAS. There were not enough artifacts collected during the limited testing phase to perform any complex statistical analysis.

LA 29362 (Trojan Hill)

Site Type: Lithic artifact scatter.

Cultural Association: Terminal Archaic (Brantley phase), ca. A.D. 1 to A.D. 750.

Land Status: Private with BLM mineral rights.

Description: The site occupies the top of a small ridge that contains mesquite, creosote, and various grasses. It is located on both sides of County Road 604, North Loop Road (Fig. 2). Over 2,000 lithic artifacts cover the ridge, with definite areas of artifact concentrations on the south side of the road in the proposed right-of-way.

The site measures 250 m north-south and 500 m east-west. Approximately three-quarters of the documented site lies within the proposed right-of-way.

Ten 1-by-1-m test pits were hand-excavated on the site. They range from 9 cm to 22 cm below the present ground surface. In each pit the underlying bedrock was reached; a reddish brown sterile sand covered the bedrock.

All test units have artifacts in Level 1; however, only five pits had artifacts in Level 2, the deepest being 22 cm on the north side of the road. The test pits did not produce any subsurface artifacts. Table 2 presents the data from the test pits.

A total of 81 lithic artifacts was collected from LA 29362. The predominant material types are quartzite (54.3 percent) and chert (38.3 percent), and the majority of the artifacts are core flakes (Table 3). Figure 3 shows the two distinct areas of heavy artifact concentration, suggesting that there may have been two separate occupations during the Archaic period.

Evaluation: Because of a lack of ceramics and the presence of several thousand lithic artifacts, the site may very likely be Archaic. A terminal Archaic date within the Brantley phase is suggested based on limited testing data. This phase dates between A.D. 1 and A.D. 750 and is characterized by burned-rock features. The site's upland location, away from the Pecos River floodplains, may be an indicator of the gradual change from riverine to upland environment by prehistoric peoples. The site has the potential to produce hearths or roasting pits and possibly subsistence materials.

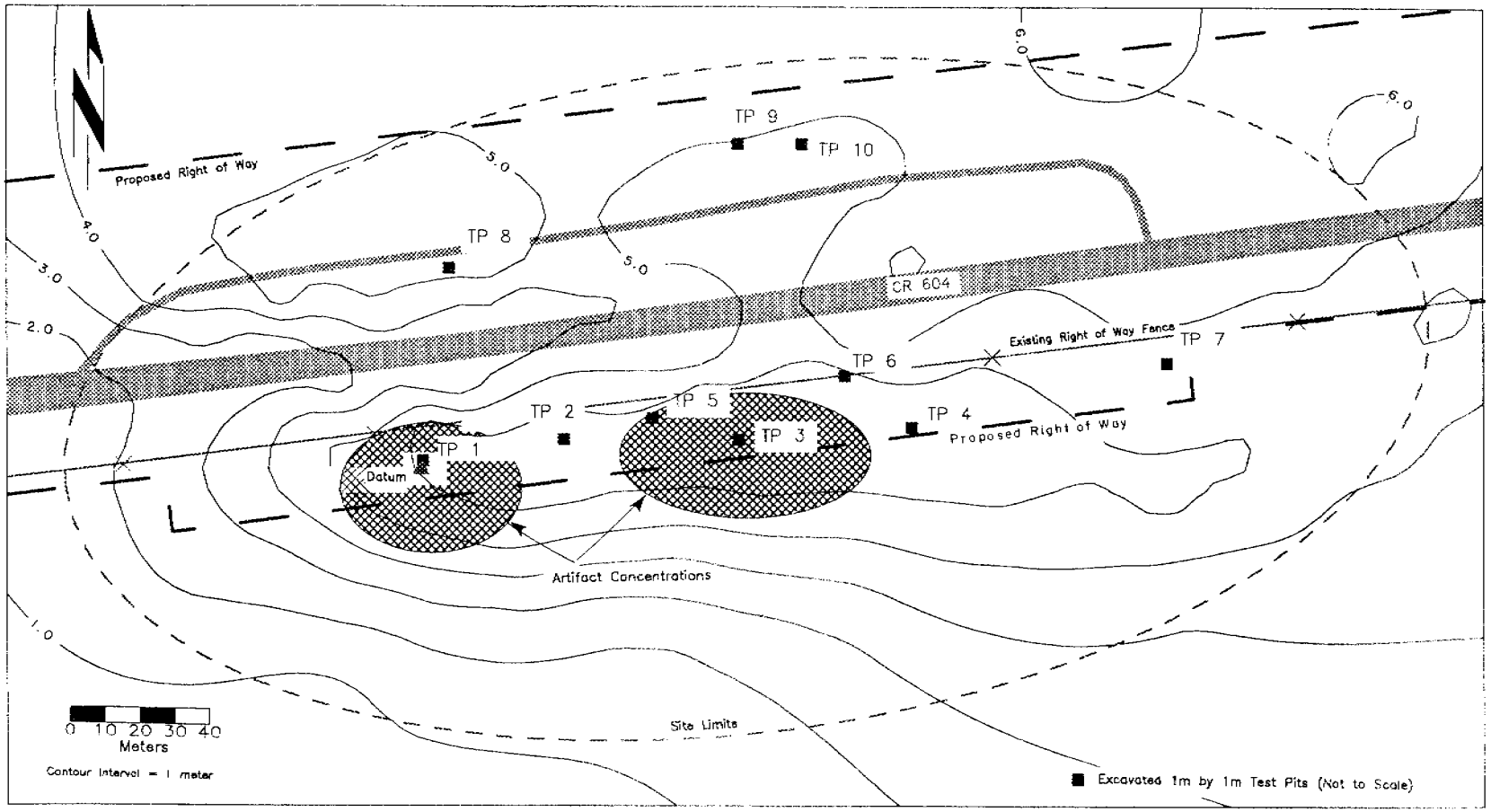

Figure 2. LA 29362, site plan.

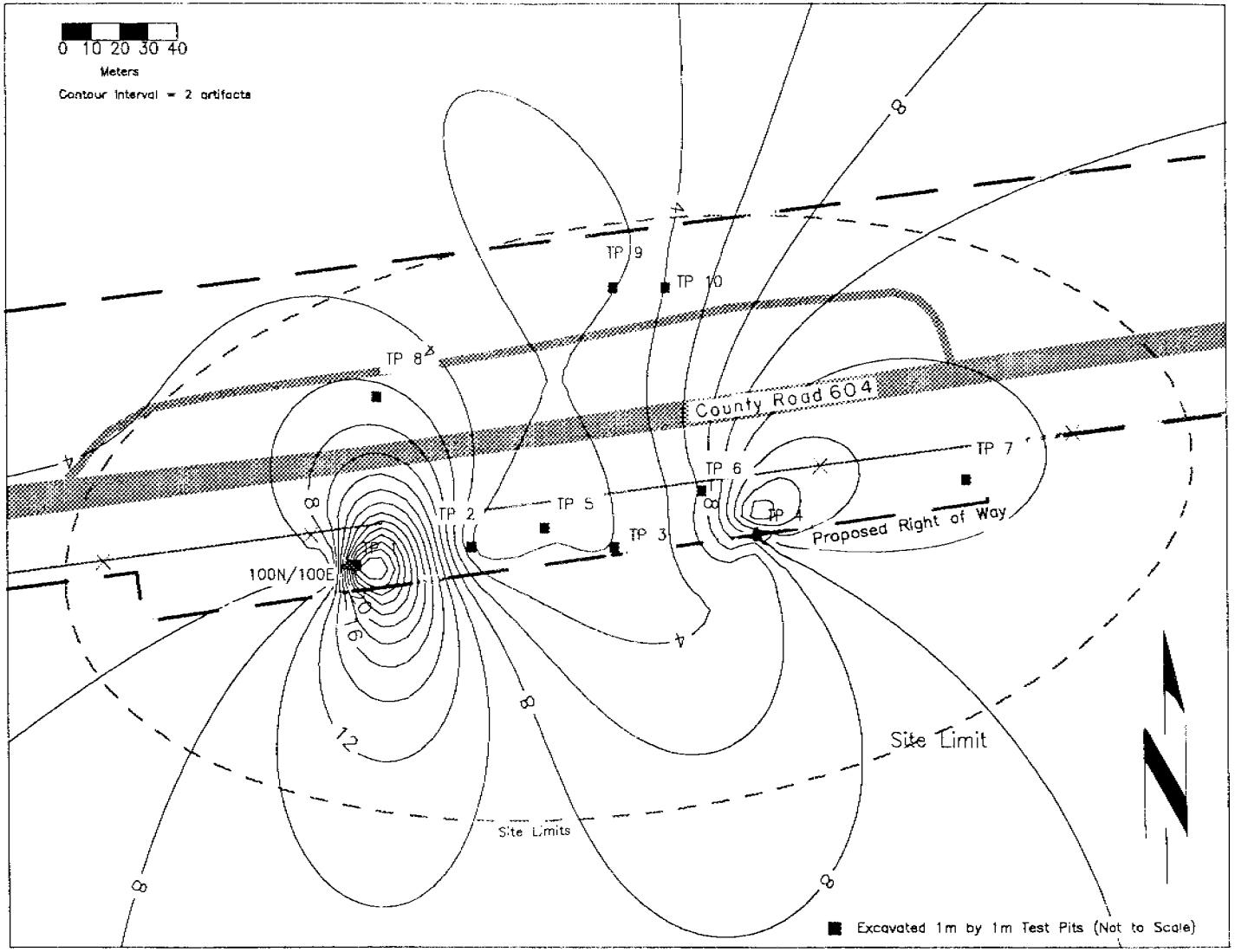

Figure 3. LA 29362, Trojan Hill, artifact density map.

Table 2. Test Pit Results

Test Pit Number	Soil	Depth (cm)	Artifacts
T 1	Sand 5YR 5.2, Reddish gray	0-4 surface strip	31 lithic artifacts
	Sand 5YR 6/2, Pinkish gray	4-14	9 lithic artifacts
	Sand with rock 5YR 6/3, Light reddish brown	14-20	no artifacts
T 2	Sand with rock, 5YR 6/3, Light reddish brown	0-3 surface strip	1 lithic artifact
	Sand with rock, bedrock reached, 5YR 6/3, Light reddish brown	3-13	no artifacts
T 3	Sand with rock, 5YR 6/3, Light reddish brown	0-4 surface strip	no artifacts
	Sand with rock, bedrock reached, 5YR 6/3, Light reddish brown	4-14	no artifacts
T 4	Sand with rock, 5YR 6/3, Light reddish brown	0-4 surface strip	10 lithic artifacts
	Limestone cobbles little sand 5YR 6/2, Pinkish gray	4-14	12 lithic artifacts
	Bedrock	14-20	no artifacts
T 5	Sand 5YR 6/3, Light reddish brown	0-2 surface strip	1 lithic artifact
	Sand with rock 5YR 6/3, Light reddish brown	2-12	1 lithic artifact
	Sand and bedrock 5YR 6/3, Light reddish brown	12-15	no artifacts
T 6	Sand with gravel 5YR 6/3, Light reddish brown	0-3 surface strip	2 lithic artifacts
	Sand with rock 5YR 6/2, Light reddish brown	3-13	4 lithic artifacts
	Sand with large rock, and bedrock 5YR 6/2, Light reddish brown	13-22	no artifacts
T 7	Gravelly sand 5YR 6/3, Light reddish brown	0-3 surface strip	no artifacts
	Gravelly sand to bedrock 5YR 6/3, Light reddish brown	3-12	no artifacts
T 8	Gravelly sand 5YR 6/3, Light reddish brown	0-2 surface strip	no artifacts
	Gravelly sand and bedrock 5YR 6/3, Light reddish brown	2-9	no artifacts
T 9	Sand with gravel 5YR 5/2, Reddish gray	0-3 surface strip	2 lithic artifacts
	Sand and rock to bedrock 5YR 5/2, Reddish gray	3-12	no artifacts
T 10	Sand with gravel 5YR 5/2, Reddish gray	0-3 surface strip	4 lithic artifacts
	Sand with rock and bedrock 10YR 6/2, Pinkish gray	3-13	no artifacts

Table 3. Lithic Artifacts from Trojan Hill

Cells: Count Row Percent	Artifact Morphology						Row Total
Material Type	Angular Debris	Core Flake	Biface Flake	Tested Cobble	Unidirectional Core	Multidirectional Core	
Chert	11 30.6	18 43.9		1 100.0		1 100.0	31 38.3
Chalcedony	1 2.8						1 1.2
Rhyolite		1 2.4					1 1.2
Limestone		3 7.3	1 100.0				4 4.9
Quartzite	24 66.7	19 46.3			1 100.0		44 54.3
TOTAL	36 44.4	41 50.6	1 1.2	1 1.2	1 1.2	1 1.2	81 100.0

LA 78119

Site Type: Lithic scatter.

Cultural Association: Unknown.

Land Status: Private with BLM mineral rights.

Description: This site is located on both sides of the North Loop Road (County Road 604) measuring 70 m north-south by 117 m east-west (Fig. 4). The site consists of six fire-cracked rock concentrations, but few lithic artifacts, scattered in an environment that contains creosote, allthorn, and various grasses. The fire-cracked rock is clustered around the south side of a small hill with one flake near them. To the west there are two dirt roads leading to a borrow pit (which is now filled with recent trash). Only one lithic artifact was present on the site. The initial survey report (Haskell 1981) recorded 20 to 30 flakes, a biface, and a mano; however, after resurveying the area the artifacts were not found. It is possible that the biface and the mano were picked up by people dumping their trash.

During the initial survey (Haskell 1981), six fire-cracked rock concentrations were located; however, only four were drawn on the original map. A total of six 1-by-1-m test units were excavated at LA 78119. Four of the fire-cracked rock concentrations were tested along with two other test pits that were placed in an area near the single observed artifact. A fifth fire-cracked rock

Table 4. Test Pit Results at LA 78119

Test Pit	Soil	Depth (cm)	Artifacts
T 1	Compact sand 5YR 6/4 Light reddish brown	0-2 surface strip	no artifacts
	Hard compact sand 5YR 5/6 Light reddish brown	2-12	no artifacts
T 2	Sand with cobbles and caliche 5YR 6/4 Light reddish brown	0-3 surface strip	1 lithic artifact
	Sand with clay and caliche pockets 5YR 5/4 Reddish brown	3-13	no artifacts
T 2 (auger)	Dry loose sand with clay and caliche 5YR 5/4 Reddish brown	80 caliche	no artifacts
T 3	Sand 5YR 4/6 Yellowish red	0-3 surface strip	no artifacts
	Sand with some gravel 5YR 4/6 Yellowish red	3-13	no artifacts
	Sand with gravel 5YR 4/6 Yellowish red	13-23	no artifacts
T 4	Sand with organic material 5YR 4/6 Yellowish red	0-8 bedrock	no artifacts
T 5	FCR concentration sandy soil 5YR 5/6 Yellowish red	0-10	no artifacts
	Sand and caliche 5YR 5/6 Yellowish red	10-20	no artifacts
T 6	FCR concentration 5YR 6/3 Light reddish brown	0-10	no artifacts
	Sand with limestone bedrock 5YR 6/3 Light reddish brown	10-12	no artifacts

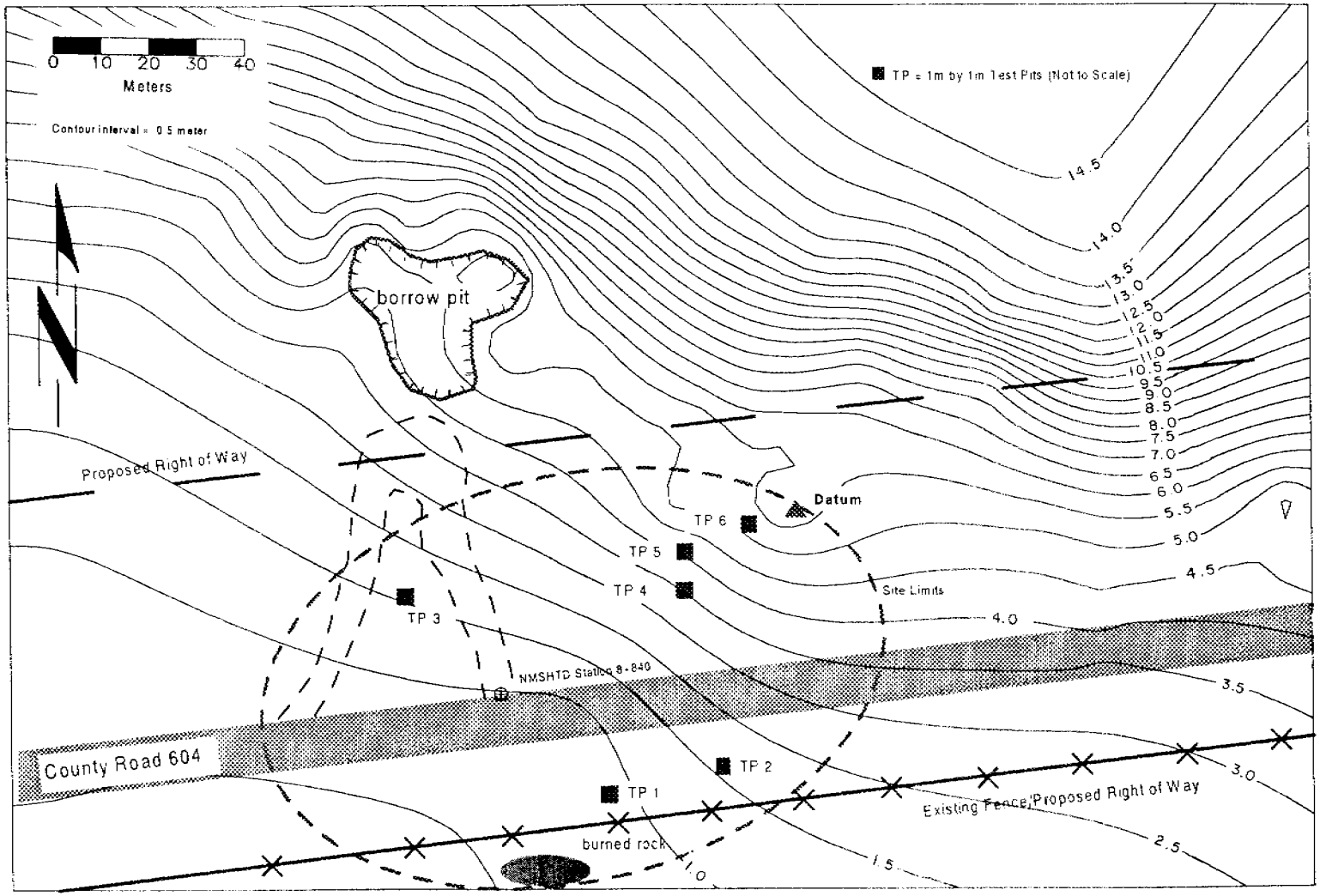

Figure 4. LA 78119, site plan.

Figure 5. LA 78119, fire-cracked rock concentration, facing north.

concentration was located outside of the proposed right-of-way; the sixth fire-cracked rock scatter was not relocated. A plan view was drawn and a photograph was taken of the fire-cracked rock areas before excavation began (Fig. 5). The test pits did not reveal any subsurface cultural materials (Table 4). The depth of the units ranged from 8 to 23 cm. In most cases caliche was reached at depths above 23 cm, except for one grid on the south side of the road in an area where silt had collected; here an auger test was taken down 40 cm to the caliche.

One artifact was recovered from LA 78119. The artifact was a core flake made of chert.

Evaluation: No subsurface cultural material or features are present within the proposed right-of-way. One other fire-cracked rock concentration exists outside the right-of-way, but is not likely to yield any further information on the prehistory of the region. No further work is recommended.

LA 29363 and LA 79978 (Macho Dunes)

Site Type: Possible pit structure and multiple thermal features.

Cultural Association: Globe phase, A.D. 800 to A.D. 1200.

Land Status: Bureau of Land Management.

Description: These two sites were given separate LA numbers during two separate surveys done by J. Loring Haskell in 1981 (LA 29363) and in 1990 (LA 79978). However, after examining the sites, we concluded that they are one continuous site (337 m north-south by 213 m east-west) that lies on both sides of the proposed right-of-way (Figs. 6, 7). It will now be addressed as LA 29363 (giving it the earlier LA number). The site is in the sand dunes approximately 1.24 km (2 miles) north of NM 62/180. Lithic artifacts, ground stone, and a few ceramics are on the surface in the dunal blowouts.

A total of 12 test pits were excavated on the site. Table 5 presents the data recovered from the test units. The testing revealed two possible pit structures in Test Pits 2 and 3 and in the cross section taken along the highway slope (Fig. 8). Burned-rock scatters were recorded near Test Pits 7 and 12 (Fig. 9). Both were in blowouts, and test excavations revealed no subsurface depth. Several other thermal features were observed outside of the right-of-way. A possible roasting pit

Figure 6. Environment at LA 29363, facing east.

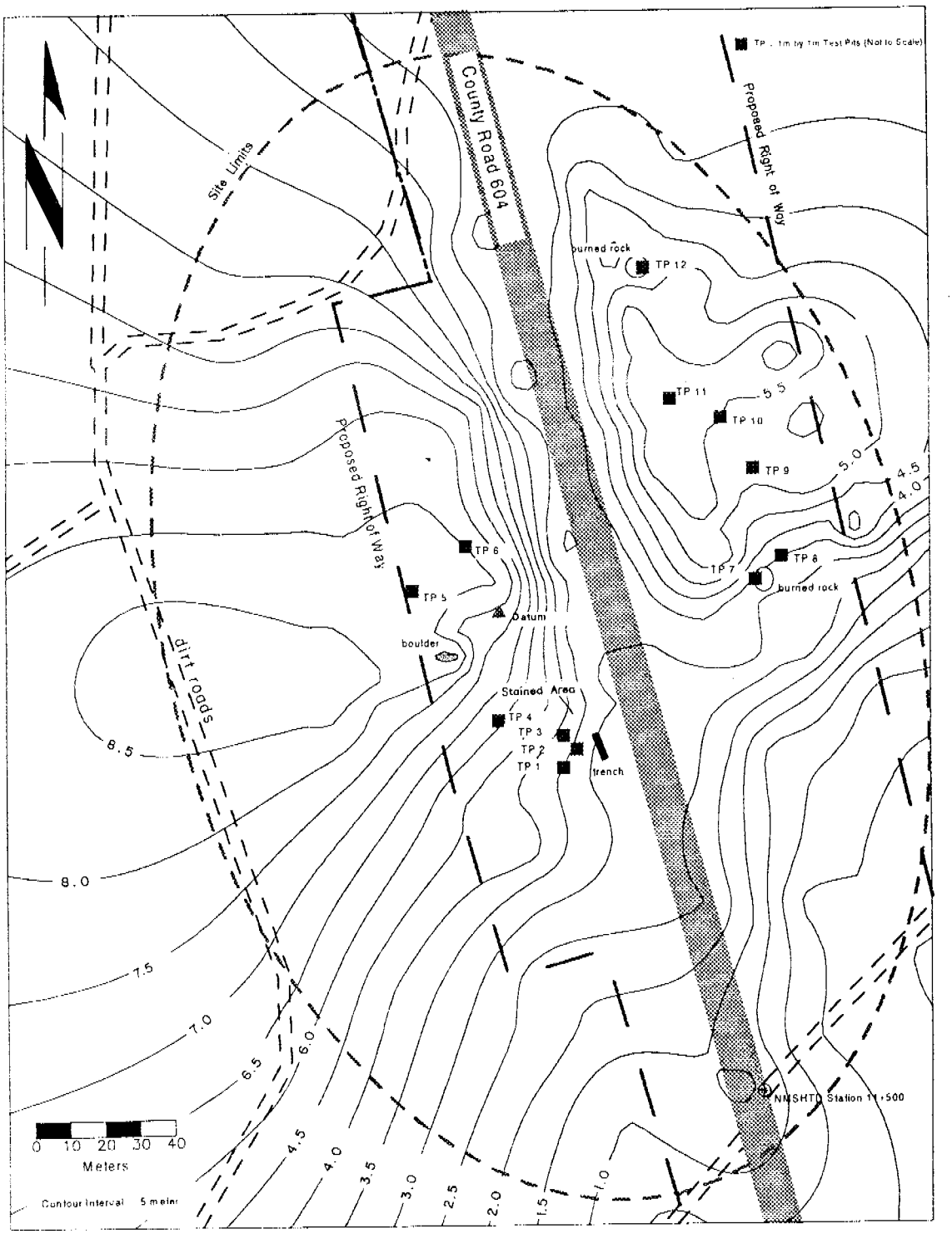

Figure 7. LA 29363, site plan.

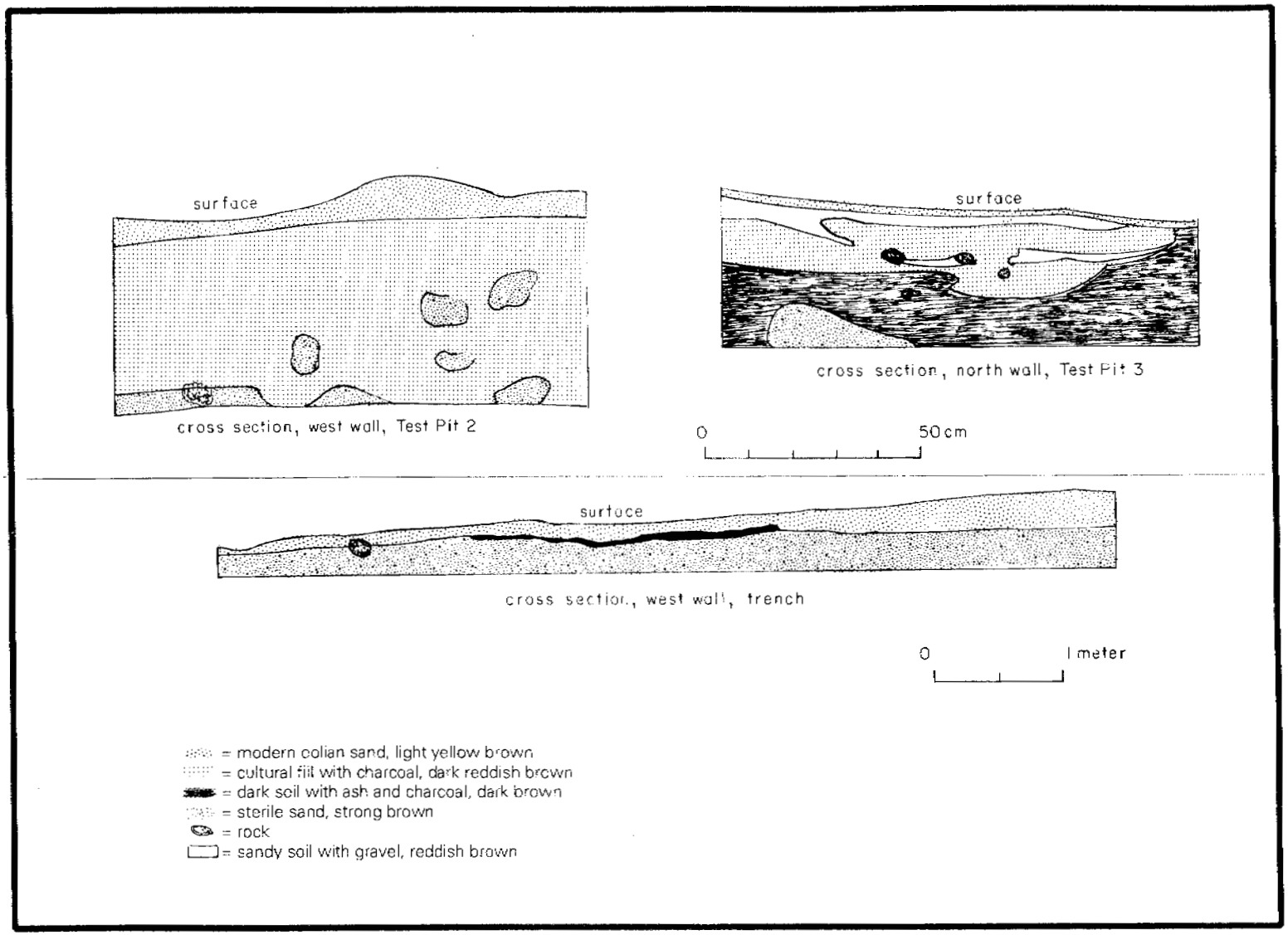

Figure 8. Location of possible pit structures: (a) Test Pit 2 with cultural fill and charcoal; (b) Test Pit 3 with burned soil and ash, possible pit structure; (c) cross section of slope cut just east of Test Pit 2 showing lens of dark soil with ash.

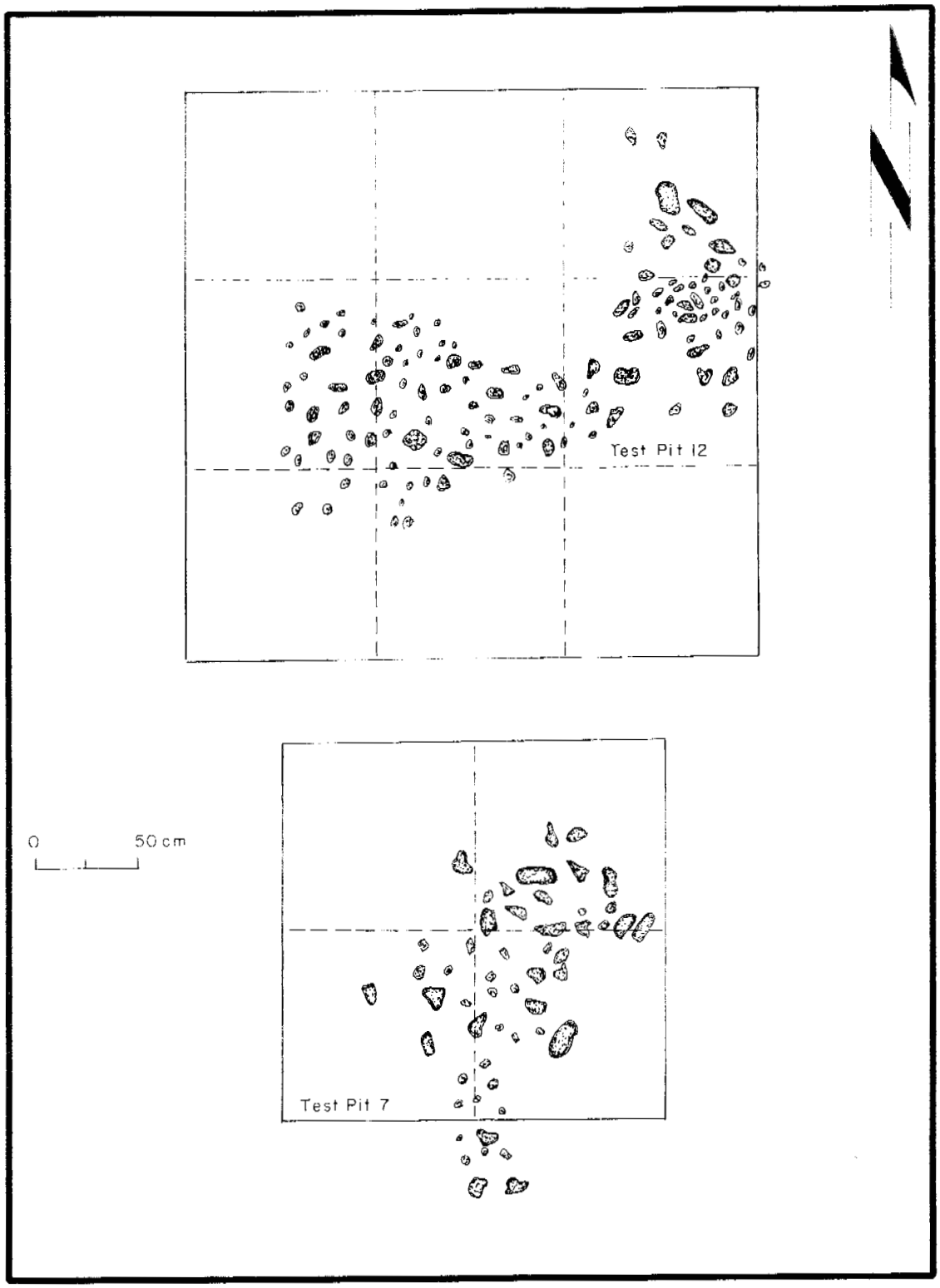

Figure 9. Plan view of burned rock scatters: (a) area of Test Pit 7; (b) area of Test Pit 12.

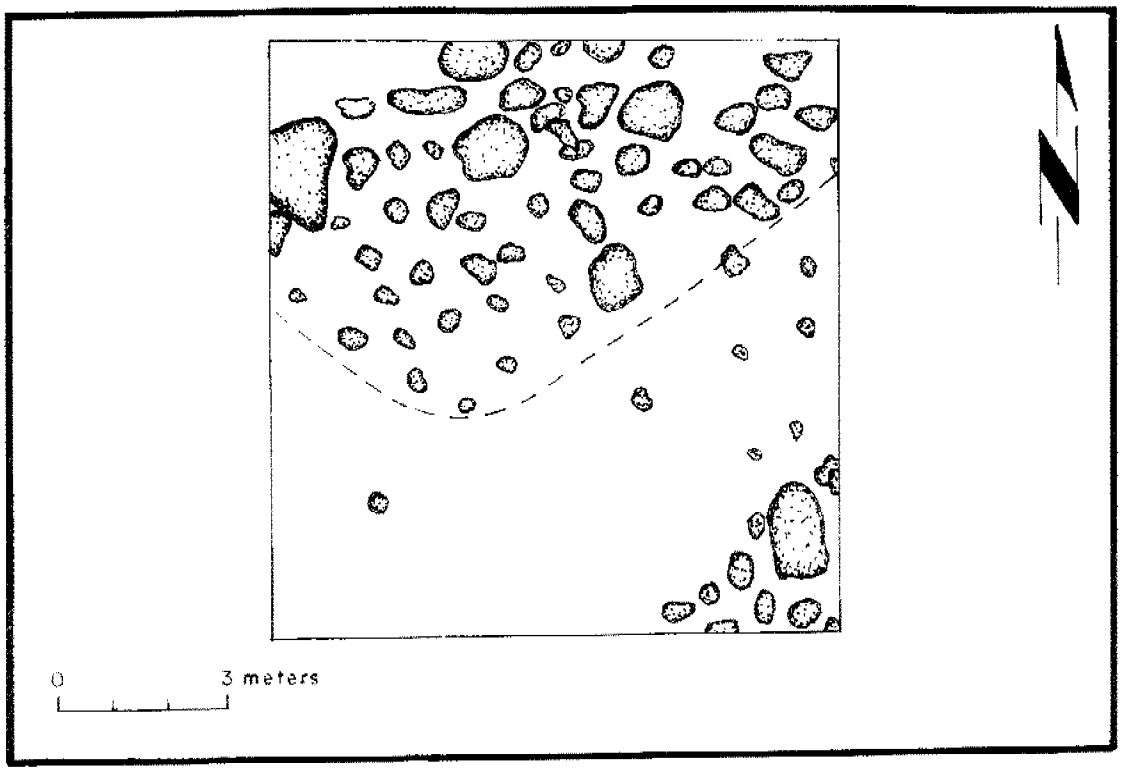

Figure 10. Plan view of Test Pit 6 showing fire-cracked rock of hearth or roasting pit, at 20 cm.

Figure 11. Possible hearth or roasting pit, looking west.

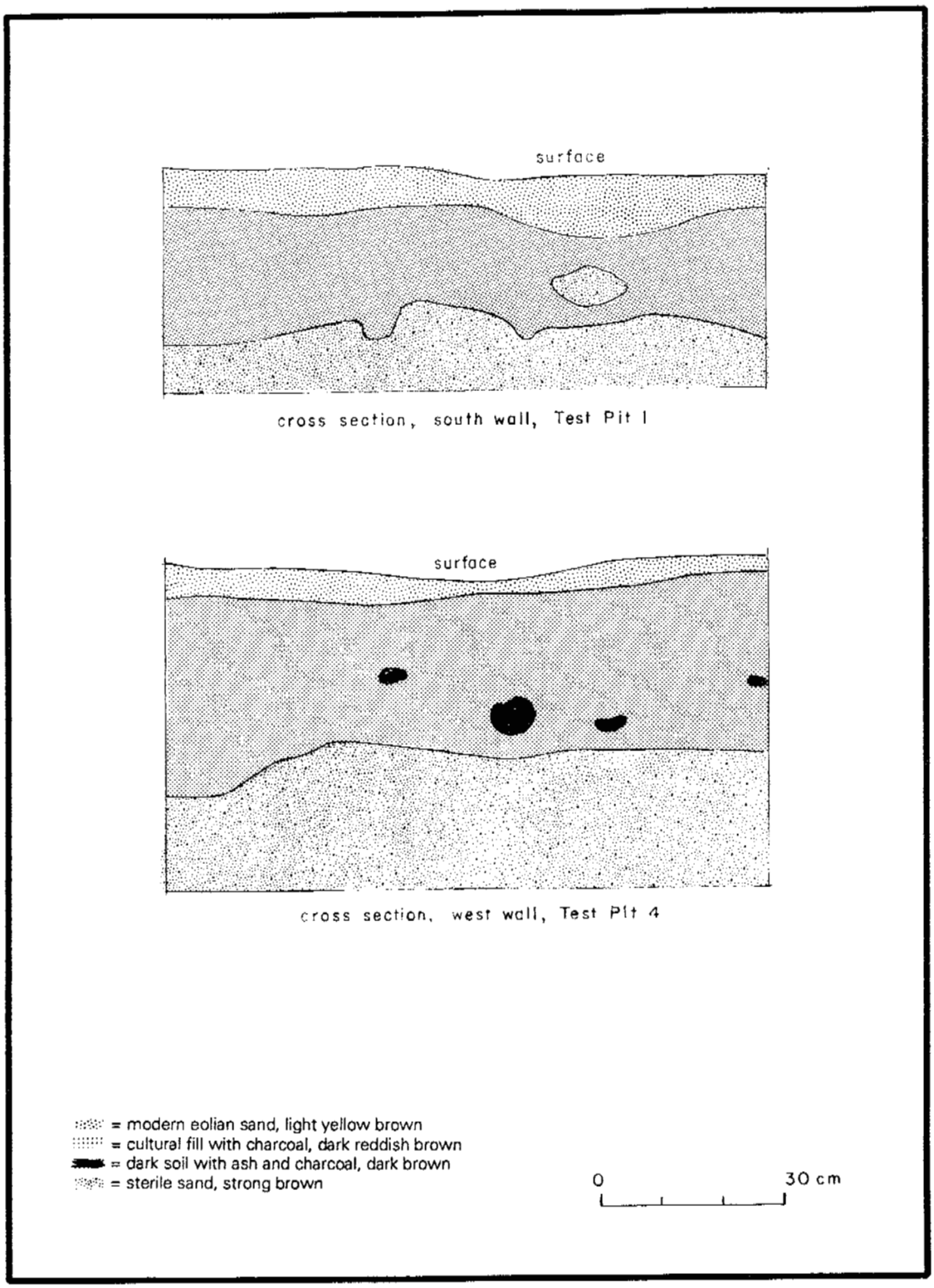

Figure 12. Test pit cross sections.

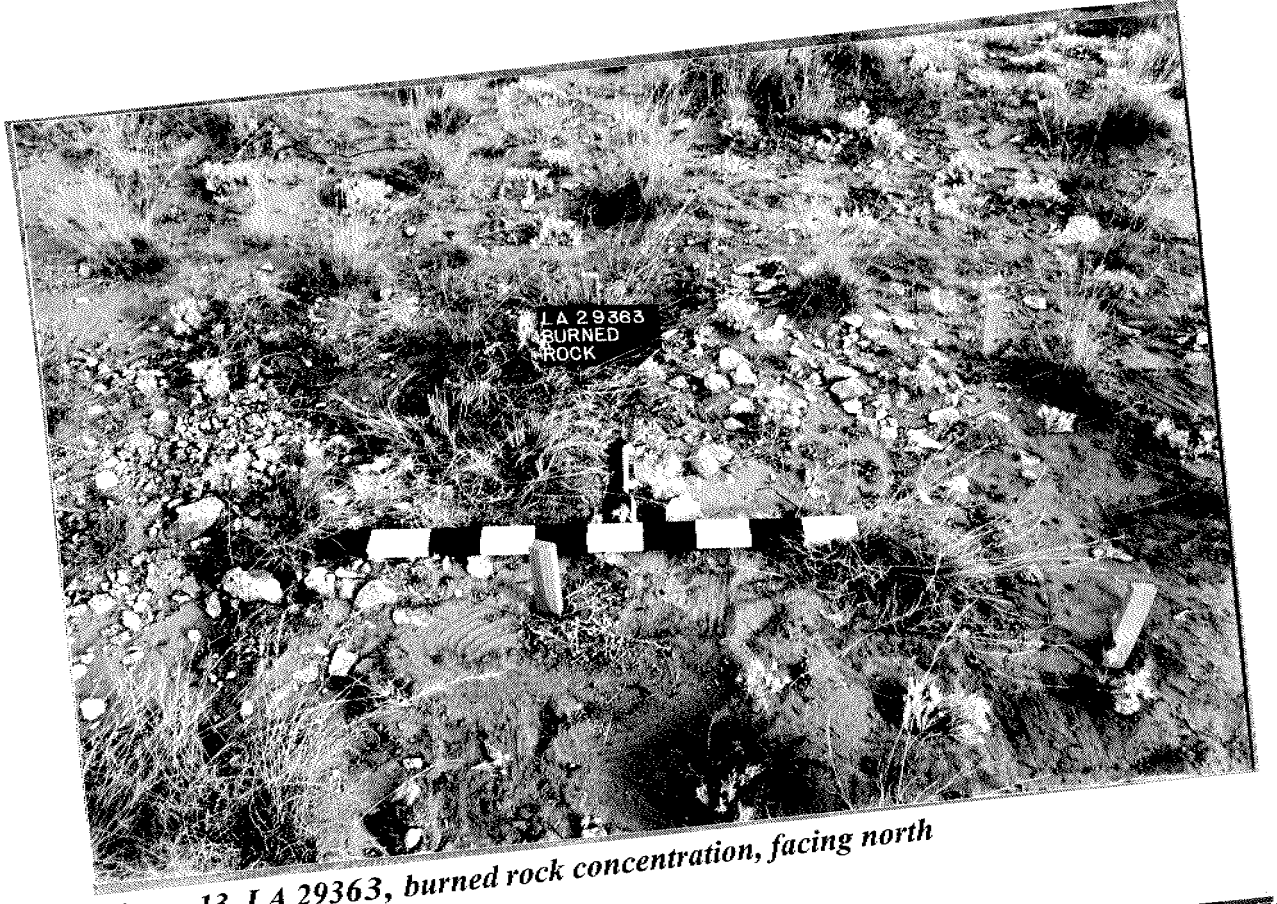

Figure 13. LA 29363, burned rock concentration, facing north

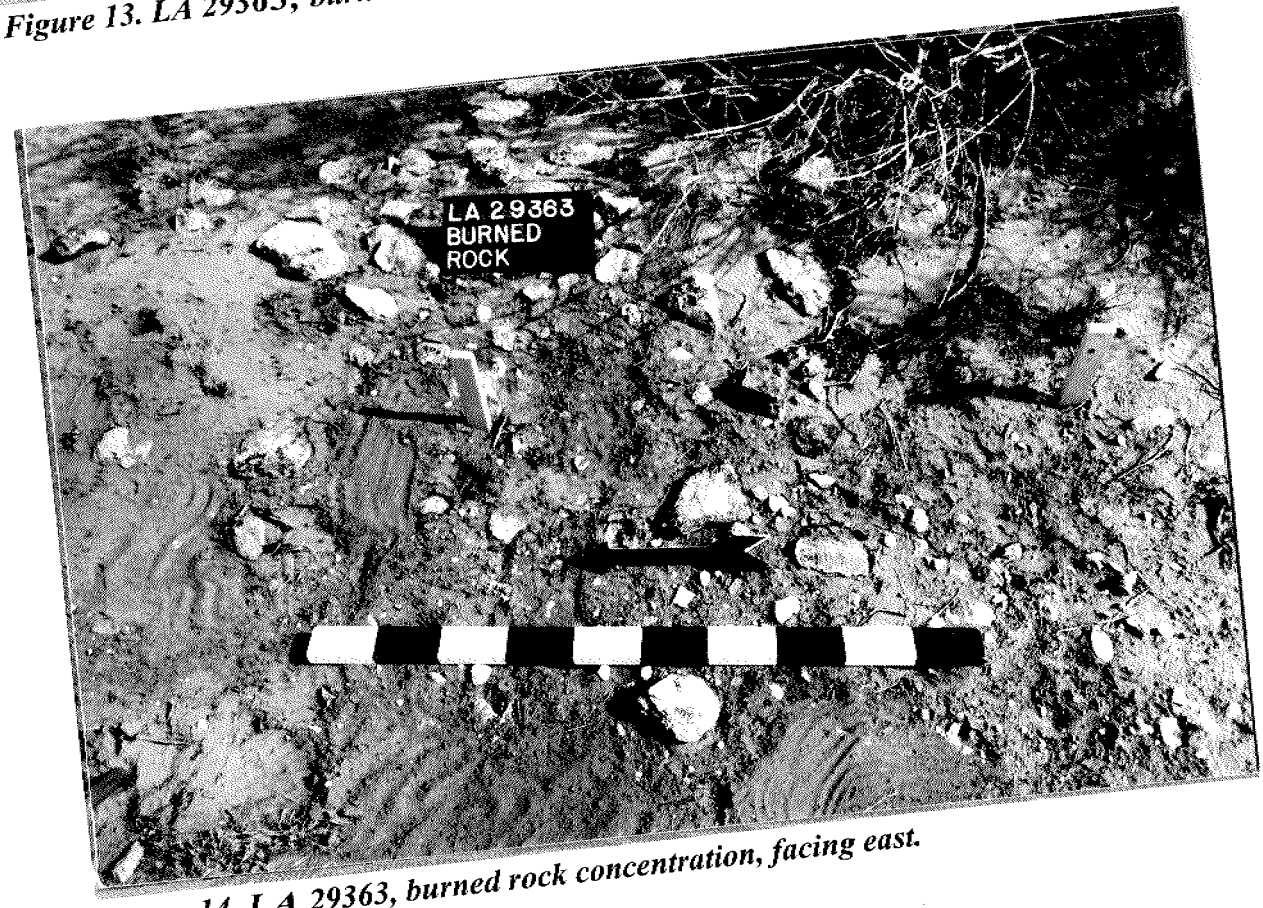

Figure 14. LA 29363, burned rock concentration, facing east.

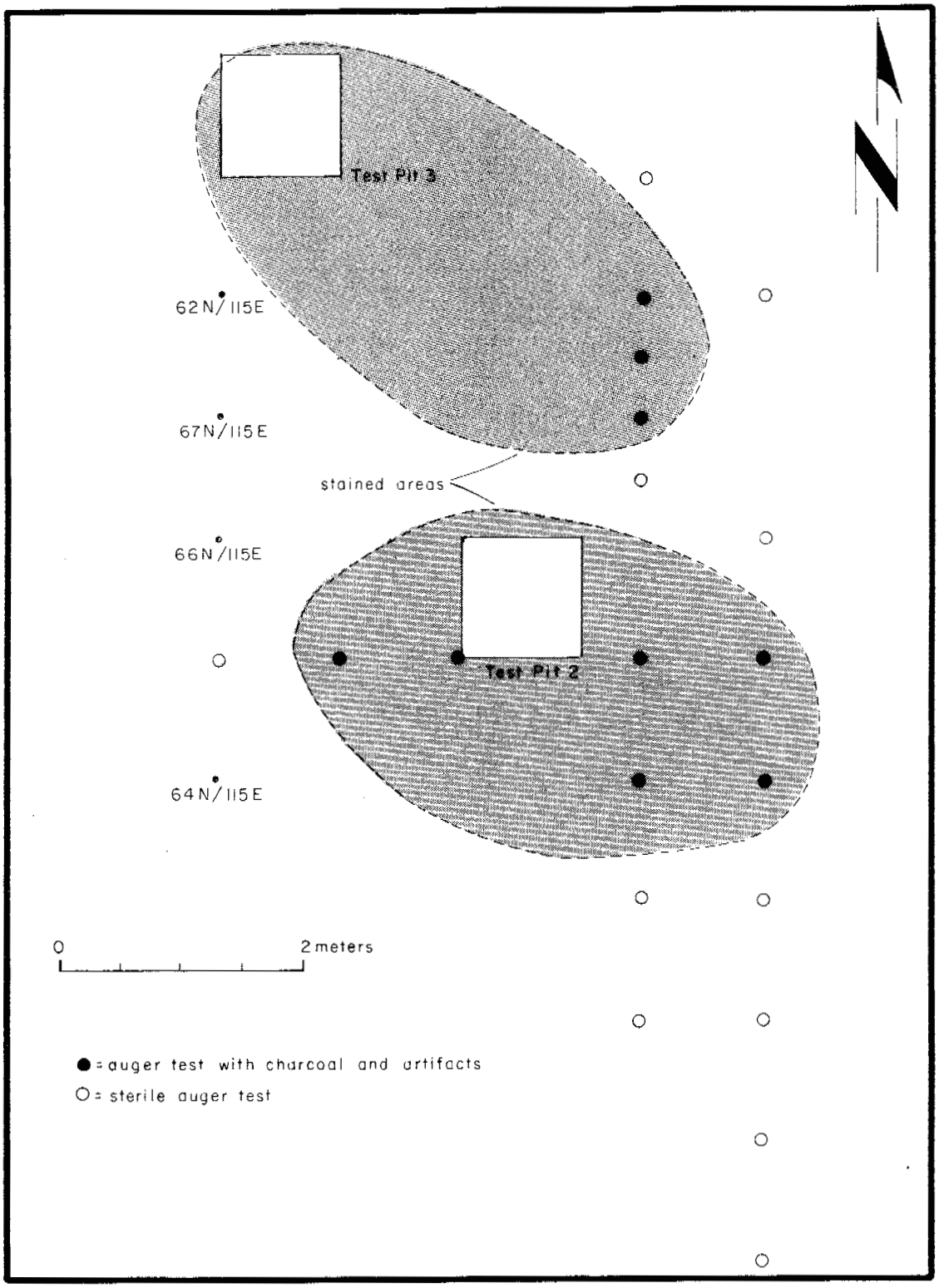

Figure 15. Location of two possible pit structures.

Table 5. Test Pit Results at LA 29363

Test Pit	Soil	Depth (cm)	Artifacts
T 1	Sand 5YR 4/4 Reddish brown	0-8 surface strip	no artifacts
	Sand with charcoal 5YR 6/8 Yellowish Red	8-18	1 C-14
	Sand with charcoal 5YR 6/6 Reddish yellow	18-28	1 C-14
	Sand with charcoal 5YR 6/6 Reddish yellow	28-38	1 C-14
T 1 (auger)	Compact sand 5YR 6/6 Reddish yellow	115 bedrock	no artifacts
T 2	Charcoal stained sand (possible burned structure) 5YR 3/4 Dark reddish brown	0-3 surface strip	2 South Pecos Brown Wares, 1 lithic artifact
	Charcoal stained sand 5YR 3/4 Dark reddish brown	3-13	no artifacts
	Charcoal stained and oxidized sand 5YR 3/4 Dark reddish brown	13-23	no artifacts
	Oxidized sand with charcoal flecks 5YR 3/4 Dark reddish brown	23-33	1 lithic artifact
	Compact oxidized sand with charcoal (possible surface). 7.5YR 5/6 Strong brown	33-43	1 C-14
T 3	Sand 5YR 4/4 Reddish brown	0-3 surface strip	no artifacts
	Sand and sparse charcoal 5YR 3/4 Dark reddish brown	3-13	1 C-14
	Sand and sparse charcoal 5YR 4/4 Reddish brown	13-23	1 C-14
	Sand and sparse charcoal 5YR 4/4 Reddish brown	23-33	1 C-14
T 3 (auger)	Sand 5YR 4/4 Reddish brown	98 bedrock	no artifacts.
T 4	Sand 5YR 6/6 Yellowish red	0-3 surface strip	no artifacts
	Sand 5YR 6/6 Yellowish red	3-13	no artifacts
	Sand and charcoal 5YR 6/6 Yellowish red	13-23	1 El Paso Brown ware, 2 lithic artifacts
	Sand with charcoal flecks 5YR 6/6 Yellowish red	23-33	no artifacts
	Compact sand with some charcoal 7.5YR 6/6 Strong brown	33-43	no artifacts
	Compact sand with minute charcoal 7.5YR 6/6 Strong brown	43-53	no artifacts
T 4 (auger)	Compact sand with caliche 7.5YR 6/6 Strong brown	85 bedrock	no artifacts
T 5	Sand 7.5Y 5/6 Strong brown	0-3 surface strip	1 metate fragment
	Sand 7.5YR 5/6 Strong brown	3-10	3 lithic artifacts
	Sand with rock 7.5YR 4/4 Dark brown	10-19 bedrock	no artifacts
T 6	Sand 7.5YR 5/6 Strong brown	0-3 surface strip	1 lithic artifact
	Sand with charcoal flecking and small cobbles. 7.5YR 4/4 dark brown	3-13	no artifacts
	Sand with FCR and flecks of charcoal (possible hearth). 7.5YR 5/4 brown	13-20	2 lithic artifacts

Test Pit	Soil	Depth (cm)	Artifacts
T 7	Sand and surface FCR 7.5YR 5/6 Strong brown	0-3 surface strip	1 lithic artifact
	Sand 7.5YR 5/6 Strong brown	3-13	no artifacts
	Sand with organic material. 5YR 4/6 Yellowish red	13-23	no artifacts
T 7 (auger)	Sand 5YR 4/6 Yellowish red	100 bedrock	no artifacts
T 8	Sand 7.5YR Strong brown	0-3	1 metate fragment
	Sand with charcoal, 7.5YR Strong brown	3-13	1 C-14
	Compact sand with charcoal flecks 7.5YR 6/6 Strong brown	13-23	2 lithic artifacts
	Compact sand 7.5YR 5/6 Strong brown	23-33	no artifacts
T 8 (auger)	Compact sand 5YR 4/6 Yellowish red	93 bedrock	no artifacts
T 9	Sand 10YR 5/4 Yellowish brown	0-3	no artifacts
	Sand 10YR 5/6 Yellowish brown	3-10	1 El Paso Brown ware
	Sand with large limestone cobbles (bedrock), 10YR 5/6 Yellowish brown	10-20	no artifacts
T 10	Thin layer of sand on top of bedrock, 10YR 5/4 yellowish brown	0-3 surface strip	1 lithic artifact
T 11	Sand 5YR 4/4 Reddish brown	0-3 surface strip	no artifacts
	Sand with root 7.5YR 5/4 Brown	2-13	no artifacts
	Sand with root 7.5YR 5/4 Brown	13-23	no artifacts
T 11 (auger)	Sand 7.5YR 5/4 Brown	123 bedrock	no artifacts
T 12	Sand with FCR on surface 7.5YR 5/6 Strong brown	0-3 surface strip	no artifacts
	Sand and bedrock 7.5YR 5/6 Strong brown	3-7	no artifacts

Table 6. Lithic Artifacts from Macho Dunes

Cells: Count Row Percent	Artifact Morphology		Row Total
Material Type	**Angular Debris**	**Core Flake**	
Chert		8 57.1	8 47.1
Chalcedony		1 7.1	1 5.9
Limestone		1 7.1	1 5.9
Quartzite	2 66.7	3 21.4	5 29.4
Quartzitic Sandstone	1 33.3	1 7.1	2 11.8
Total	3 17.6	14 82.4	17 100.0

was uncovered at 20 cm depth in Test Pit 6 (Figs. 10, 11). The east side of the site had one area of potential depth (Test Pit 8); however, on the west side, charcoal-flecked soil and artifacts were present in several test units even though no features were found (Figs. 12-14). There is the possibility of cultural features existing beneath the surface in this area of the site.

One possible pit structure in Test Pit 2 (Fig. 15) measures approximately 2.75-by-4.25 m with a potential depth of 43 cm where a hard-packed surface was encountered. Another possible structure encountered in Test Pit 3 (Fig. 15) measures approximately 2.50-by-4.75 m. Soil was charcoal-stained and ashy in both test pits. No fire-cracked rock was present. Two South Pecos Brown Ware sherds and a lithic artifact were recovered on the surface in Test Pit 2.

Test Pit 8 was placed within the same blow-out where Haskell (1981) recorded a mano, a sherd, and several lithic artifacts, including a biface. OAS excavations reached depth of 33 cm before encountering sterile soil. Several lithic artifacts and a metate fragment were recovered.

The site has a depth ranging from 8 cm to 43 cm. Most of the artifacts are from 13 to 33 cm below the ground surface. The burned-rock areas did not produce any artifacts below the surface stripping.

A total of 17 lithic artifacts, 4 brown ware ceramics, and 2 ground stone artifacts were recovered from LA 29363. The majority of the lithic artifacts consisted of core flakes and the predominant material type was chert (Table 6). The ceramics consisted of South Pecos Brown (n = 2), El Paso Brown (n = 2), and an indeterminate polished brown ware. Two ground stone fragments of sandstone were also collected. These two artifacts are slab metate fragments, which were both located in areas where there are possible hearths.

Evaluation: The five brown ware sherds (no painted wares) collected from testing pits at Macho Dunes suggest an A.D. 800 to A.D. 1200 date for at least some portions of the extensive site. This would temporally place the site within the Globe phase. However, the many discrete blow-outs may

actually reveal a pattern of continuous use over time. Because of the several pit structures and thermal features, this site has the potential to yield important information on the prehistory of the region. Further archaeological work is recommended. Excavation should concentrate on those areas of the site where there is cultural depth or potential features are present.

RECOMMENDATIONS

Four prehistoric sites were tested by the Office of Archaeological Studies for NMSHTD WIPP-7615(8), in Eddy County, New Mexico. Two, LA 29362 and LA 29363 (includes 79987), are likely to yield important information on the prehistory of the region. LA 29362 is an extensive, undisturbed Archaic lithic artifact scatter that has the potential to inform on little-known Archaic adaptations in the Carlsbad area. LA 29363 has undisturbed, subsurface materials that include thermal features and possibly pit structures. It is a Jornada Mogollon site probably dating post-A.D. 800. It has the potential to increase our information and understanding about Jornada subsistence strategies in this area. Excavations within the proposed right-of-way are recommended for these two sites. One site, LA 78119, was found to not have cultural remains and no further work is recommended.

The following section presents a data recovery plan for the two sites that are recommended for excavation

DATA RECOVERY PLAN FOR LA 29362 AND LA 3926

(Portions adapted from Wiseman 1996)

Theoretical Perspective

Prehistoric occupation of southeastern New Mexico has been documented from the Paleoindian period through the presence of the Mescalero Apache, a period of over 13,000 years. Earlier research goals in the region were geared mainly to defining the culture history of the region (Lehmer 1948) and its specific cultural attributes (Mera 1943). Interest in refining cultural manifestations, principally ceramics, has continued up to the present with the work of Greer (1965), Runyon and Hedrick (1973), Brook (1975), and Leslie (1979). However, today professional research goals have taken on broader, more regional aspects with primary interests in differentiating sedentary phases (Whalen 1977; Katz and Katz 1985a), determining site functions (O'Laughlin 1980; Wiseman 1996), assessing subsistence bases (Basehart 1974; Oakes 1985), and correlating site locations with environmental parameters (Oakes 1985; Katz and Katz 1993). While explanation of the settlement-subsistence dynamics of southeastern New Mexico is still tenuous at best, the potential for systemic explication now and in the future is extremely promising.

Several general statements about the environment and the sites may be made. The desertic condition of unproductive soils, frequent lack of potable water, undependable precipitation, and surficial nature of the cultural remains would seem to preclude use of the sites as sedentary habitation units. We suggest that the sites were temporary campsites or specialized activity locales used by foragers or collectors of differing chronological periods.

We are basing our proposed research upon an environmental frame of reference which states that culture is adaptively organized to solve specific problems posed by the environment. One primary problem for regional groups is the acquisition of subsistence items. Thus variability in a culture's systemic organization is responsive to the variability in availability of food. Some adaptive responses could include collecting, foraging, hunting, storage, trade, sedentism, mobility, and so forth, or any combination thereof. We believe there were specific environmental variables in the Carlsbad region which conditioned the selection of particular food procurement strategies such as (1) seasonality of availability, (2) quantity of biomass, (3) accessibility of resources, and (4) density of participating population. We believe the generalized strategy of wild food gathering would have been the best adaptive response to the local environment.

Background Considerations

Katz and Katz (1985a) provide an excellent outline of prehistoric cultural developments in the Guadalupe Mountains-Carlsbad region. But the Katzes would be the first to admit that this sequence, which covers Paleoindian through early historic Native American periods, requires verification and elaboration. The last two periods--Globe (A.D. 750-1150) and Oriental (A.D. 1150-1450)--are not as well known as earlier ones, largely because aboriginal use of the greater Carlsbad area had decreased markedly in favor of the Guadalupe Mountains and their foothills west of the Pecos River. The two project sites likely represent the Brantley (terminal Archaic) and Globe (Formative period) phases and lie east of the foothills of the Guadalupe Mountains. In the

nearby areas, the Querecho phase represents the same cultural adaptation as the Globe phase. They provide an excellent opportunity to examine prehistoric adaptations during these phases and of verifying or modifying the shift in subsistence emphasis posited by the Katzes.

As discussed in more detail below, horticulture evidently was not practiced prehistorically in the Guadalupe-Carlsbad region. This fact, plus other characteristics, have led Robert Mallouf (1985) to suggest that the prehistoric remains of the southern Guadalupe Mountains are more closely associated with the Trans-Pecos culture area of west Texas (the western "arm" of the state, except El Paso County) than with the Jornada-Mogollon to the west and north. We concur with Mallouf. Drawing on the Katzes work at Brantley, we suggest that the same applies to the Carlsbad area as well, including the sites being considered for the present project. However, a formal line of demarcation between the Trans-Pecos (including the Guadalupe-Brantley region) and the Jornada-Mogollon remains to be defined.

There are several implications to the assignment of the Guadalupe-Carlsbad region to the Trans-Pecos. First, as far as can be ascertained at present, the peoples inhabiting the Trans-Pecos--with the exception of those at La Junta de los Rios on the Rio Grande (present-day Presidio, Texas)--lived an Archaiclike, hunter-gatherer lifestyle throughout the prehistoric and historic periods. Many late prehistoric sites in the Trans-Pecos produce small amounts of pottery, but all of it was probably traded in from nearby regions. Most or all of the pottery on Guadalupe-Brantley sites came from the Sierra Blanca and El Paso regions to the northwest and west, respectively.

Hunter-Gatherer Subsistence Systems

Past research in the Guadalupe-Carlsbad region, as in the Trans-Pecos in general, indicates that baked succulents such as lechuguilla and sotol were a fundamental aspect of pottery period (Late Prehistoric) subsistence (Greer 1965, 1967, 1968; Roney 1985; Katz and Katz 1985a). Archaeological remains of baking ovens usually take the form of midden rings or circles of burned rock surrounding central pits, though burned-rock mounds of other shapes are also known (S. Katz, pers. comm. 1996; R. Phippen, pers. comm. 1996). Midden circles date as early as the Middle Archaic period in Texas but are more common in later time periods. Most dated ovens in the eastern Trans-Pecos, including the Guadalupe Mountains, belong to the post-A.D. 500 pottery period (Roney 1985:144). Since these succulents provide a reliable, year-round source of carbohydrates, they were understandably important to prehistoric and historic diets and probably obviated the value of, or need for, many other carbohydrate sources including corn (Sebastian and Larralde 1989; Roney 1985).

W. H. Wills (1988:54-55) points out that succulents are usually scattered across the landscape rather than clumped, which probably affected humans in yet another way. He posits that the scattered nature and year-round availability of these resources in the Trans-Pecos led to the retention of a more nomadic, "forager" pattern, rather than a less nomadic, logistically organized pattern (Binford 1980). In simplest terms, foragers move to the food, and collectors move the food to the people. Collectors do this by means of task groups that are sent out to obtain specific resources and return them to the group, a behavior warranted by resources that occur in clumped or patchlike distributions. The primary differences between collector and forager lifestyles are the degrees and ways in which people plan, organize, and conduct their food-quest in response to resource distributions and seasons of availability.

In theory, forager and collector sites should have fairly distinctive attributes. These might be summarized as follows:

> **Forager** sites should be similar, and their archaeological visibility should be subtle, perhaps even inconspicuous, because people are moved to the resources, the sites are inhabited for shorter periods of time, have smaller accumulations of trash, and similar ranges of artifact types. They are occupied for relatively short periods of time (days or few weeks), relatively few items (manufacturing debris, broken artifacts, etc.) should be left behind.
>
> **Collectors**send out work parties to set up temporary special-activity sites, collect the target resource(s), and take the food back to long-term base camps. The characteristics of both should be as follows:
>
> *Base camps* are generally quite visible archaeologically because they are used for a wide range of daily activities, resulting in the accumulation of a wide range of artifact types, activity areas, and refuse deposits. Some form of structure, whether ephemeral or more substantial in construction, is usually present, as are pits for the storage of food and other items. Base camps are generally used over long periods of time (several months) each year for several years, sometimes in sequential years and sometimes in staggered years or sets of years. A logistically organized group generally has only one or two base camps that it uses during a given year.
>
> *Special activity sites,* on the other hand, are created during collecting expeditions, might be used only once, and are almost invisible archaeologically because they are used for only short periods, have little or no accumulation of nonperishable debris and broken artifacts, and have limited artifact inventories that reflect comparatively few activities.

While we generally agree with Wills's proposition, we, like Sebastian and Larralde (1989) and Collins (1991:8), emphasize the view that these strategies--foragers and collectors--are two ends of a continuum, not a dichotomy. In a given year or over a series of years, some groups may actually employ both strategies because of factors relating to season, climatic regimen, economic success, demography, competition, and other factors (see Boyd et al. 1993 for a recent discussion). Sebastian and Larralde present an example of a "mixed" forager/collector strategy in the concept of "serial foraging." Using the Archaic peoples of southeastern New Mexico as an example, they define serial foraging as follows (Sebastian and Larralde 1989:55-56):

> A strategy of **serial foraging** involves a small residential group that moves into the general vicinity of an abundant resource and camps there, uses the target resource and other hunted and gathered resources encountered in the general area until the target resource is gone, or until another desired resource is known to be available, and then moves on to the next scheduled procurement area. Such a strategy could be expected to create a great deal of redundancy in the archaeological record, an endless series of small, residential camps from which daily hunting-and-gathering parties move out over the surrounding terrain, returning to process and consume the acquired foods each evening. If the resources were randomly distributed, all the sites would look generally the same. But since many of the resources appear in the same place year after year or in some other cyclical pattern, some sites tend to be reoccupied.

Reoccupied sites, then, would be a clustering of small, single-event, serial-foraging sites. But, Sebastian and Larralde (1989:56) envisage a complicating factor:

> The only exception to the rule of basically redundant but sometimes overlapping small campsites would be the winter camps. Given the relatively brief winters of the Roswell District, many of the sites would, on the surface, be no different in appearance from reoccupied short-term camps. Excavation of such sites might recover resources indicating a winter seasonal occupation or features indicative of storage, however. If we were able to differentiate single, large-group occupations from multiple, small-group occupations, we might find that winter sites differ from warm season camps in that they were occupied by larger groups.

In the above scenario, the settlement types of serial foragers should then start taking on the appearance of collectors' sites. While this introduces some difficulty in archaeological studies, it probably approximates reality to a greater degree and certainly seems to make better sense with respect to the archaeological record of southeastern New Mexico as we become increasingly familiar with it.

In addition to feature and artifact content of sites, Collins (1991:7-8) suggests biological correlates of forager and collector sites, particularly those involving burned rock middens. He suggests that the difference between the two might be signaled by whether the plant species processed are r-selected or not. That is, collectors would focus on r-selected species that are available in large numbers/amounts during short periods of time, requiring some form of preparation and storage for long-term benefit to humans. Foragers, on the other hand, would rely mostly on those plant species that are available throughout the year, precluding the need for storage but usually requiring greater mobility because their distribution across the landscape is general, not patchy. Collins suggests that animal species might also be conducive to this type of analysis, but because animals are mobile, they are not particularly useful in this regard.

In regards to subsistence strategies, it is appropriate to touch on the subjects of gardening-farming and food storage. The evidence for prehistoric horticulture in the Guadalupe-Carlsbad region is minimal at present. Roney (1985:44) states that corn was recovered from only three sites, all of them caves in the Guadalupe Mountains, but in each case, few remains were found. The Pratt Cave example (now published as Schroeder 1983:67) involves one or more corn kernels recovered from the vicinity of a hearth. Since two chile seeds were recovered from a lower level in the same test, it seems likely that the corn was introduced during the historic period by Apaches, rather than during Archaic times as suggested by Roney. According to Roney, the proveniences and temporal associations of the other two reports of corn are also uncertain. This leads us to conclude that horticulture either was not practiced by many of the prehistoric inhabitants of the Guadalupes or was practiced on only a very limited scale. Degree of dependency on corn in the Carlsbad area is an unresolved issue and will be addressed with the subsistence data obtained from the two sites to be excavated.

Storage, usually in the form of pits, is believed to be a key signal as to the existence and identification of base camps and habitation sites. The storage of quantities of foodstuffs is a characteristic of logistically organized subsistence systems. Generally speaking, storage implies a location that is easily protected or otherwise secure from theft. Sebastian and Larralde (1989:86) advance the interesting hypothesis that, because some resource patches are spread over the landscape and create a logistical problem for exploitation, some people may actually have cached foods in the collection areas and then moved their families from cache to cache as needed

throughout the winter season. This constitutes yet another variation on the forager theme. But while it may actually reflect the situation in southeastern New Mexico, it also has the strong potential for confusing the interpretation of archaeological remains.

So how does one come to grips with this problem? Collins (1991:7-8), in discussing research on burned-rock middens in Texas, provides us with a test for determining whether a forager system or a collector system prevailed during the occupation of a specific site or set of sites. He posits:

> Therefore, complex components associated with burned rock middens which evidence quantities of remains of any one or more r-selected resources to the near exclusion of other kinds of resources imply, at least to some degree, the adaptive characteristics listed above and would favor an interpretation that burned rock middens were specialized food preparation features. Mesquite beans, prickly pear tunas, all deciduous nuts such as pecans and acorns, and psoralea are examples of r-selected plant foods. The geographic distribution of burned rock middens [in Texas] does not encompass the range of any notable r-selected animal species, however, seasonal availability of some animals, such as bison or migratory waterfowl could sometimes trigger behavior similar to that of r-selected resource exploitation, but the availability of such resources is not sufficiently reliable to result in the establishment of the same adaptive pattern.
>
> In contrast, plant and animal foods that are edible and available for all or much of the year (sotol, prickly pear pads, lechuguilla, antelope, rabbits, deer, bison in some areas, fish, mussels, turkey, and others) can be exploited in the more generalized foraging strategy and have different behavioral correlates. Evidence that foods of this kind provided the principal staples of groups responsible for burned rock middens would be evidence that these were not specialized food processing facilities, and that those responsible may have been foragers.

Data Recovery Questions

The investigations proposed for the project sites will be directed towards answering basic questions about settlement and subsistence behavior in the north end of the Trans-Pecos culture area. The main thrust will focus on documenting and validating the culture sequence recently formulated and outlined by Paul and Susanna Katz (1985a), expressed as follows.

Judging by surface manifestations, LA 29362 is Archaic and LA 29363 is early in the Late Prehistoric or Formative period. Feature types tentatively identified include possible hearths, baking features, a pit structure, burned-rock scatters, and artifact scatters. The proposed data recovery project will investigate these features. Part of the effort will also focus on finding and excavating any pits or other features currently masked by the dunes and artifact concentrations. Every effort will be made to recover and record information pertinent to the research outlined below and the specific questions that follow.

(1) Evaluate (verify or modify) our perception of the cultural content of the Brantley and Globe phases, and where possible, augment the criteria by which the phases can be

distinguished. These phases span the terminal Archaic through the early Late Prehistoric periods in the regional sequence (Katz and Katz 1985a).

(2) Evaluate (substantiate, refute, or modify) the subsistence trend outlined by the Katzes (1985a) for the Carlsbad area. The Katzes believe that a major subsistence shift took place during the prehistoric sequence. Riverine resources such as mussels were important foods during the Avalon, McMillan, and Brantley phases (Middle Archaic through terminal Archaic), and nonriverine resources were largely supplemental. But starting in the Brantley phase, and continuing throughout the Globe, Oriental, and Phenix phases (the entire Late Prehistoric period), upland resources became more important and riverine resources less important. While this is better conceived as a change in emphasis, rather than a sharp change from one set of resources to another, it led to a markedly reduced human presence along the Pecos River.

Although the Katzes' reconstruction of the settlement and subsistence patterns appears justified by their data, we believe that the number of sites and components investigated by them are relatively few in number and, being concentrated near the Pecos River channel, do not fully represent the river valley occupation. Our project sites, being closer to the river, should permit us to fine-tune our perceptions of the entire riverine settlement.

(3) Determine whether the inhabitants of the Guadalupe-Carlsbad region farmed and if so, determine how prominently cultigens figured in the diet relative to wild foods. Given their proximity to horticultural peoples of the Southwest, it is surprising that prehistoric peoples in the Guadalupe-Brantley region did not farm. But, assuming that they did not farm, we then need to determine whether the reasons are cultural, demographic, climatic, or some combination of these. Could it be that the increased utilization of succulent baking precluded the need for, or usefulness of, the adoption of farming, as has been suggested?

1. Are the prehistoric components of the project sites foraging or collecting, base camps/habitation sites, special activity sites, or some combination?

If LA 29362 functioned as a foraging locus, the following characteristics are expected:

(1) Evidence of repeated short-term occupations (numerous redundant features scattered over the landscape). Attributes that should not occur include long-term storage features, residential structures, formal midden deposits. Attributes that may be present may include ephemeral structures, sheet trash deposits, and a wide variety of manufacturing maintenance and food procurement activities (Moore, in press).

(2) Formal interior heating should be absent.

(3) Evidence for a wide range of floral and faunal resources in the diet. Cultigens would likely be rare. Only local food remains should be found.

If LA 29363 was used by ceramic period logistical task groups, the following characteristic could be expected:

(1) Evidence of relatively longer period of occupation than at LA 29362. Storage facilities may be present and there may be specific trash disposal and activity areas.

(2) Structures should be shallow and reflect warm-season use, although interior hearths could be present.

(3) Evidence for a wide range of floral and faunal resources in the diet. Cultigens may occur. Foods from nonlocal sources may be found.

(4) Structures and thermal features should be present and may evidence signs of reuse. Or there may be evidence of redundant or related features representing repeated use over time.

(5) A variety of food containers (ceramics) should be present, although they may be limited in number.

It may be difficult to distinguish between these patterns of use in some cases, particularly if curation of tools occurred at either site. However, the compilation of data should allow us to assess the assemblages and determine the patterns of use.

LA 29363 (Macho Dunes) contains a possible pit structure and a baking pit, and several burned-rock areas. But are storage pits, other kinds of pits (for processing foods), and other types of thermal features also present on this and LA 29362? It is virtually guaranteed that the two sites were occupied more than once during the prehistoric period. Assuming so, we need to discover not only what kinds of features are present, but also which ones were contemporaneous and which were not. Were the activities or site function during each component the same or different?

At this stage in the investigations we have few observational data and facts by which to judge the answers to these questions. More intensive work will probably greatly modify our perceptions and interpretations of the prehistoric components at the project sites. The minimal data available suggest that two or more components are present at LA 29363 and probably represent two or more phases in the Katzes' sequence. The validity of this expectation requires confirmation. To do this, we will need to discover, isolate, and study features and artifacts belonging to separate occupations (components).

Once individual components are defined, we can then proceed to document the activities that took place at each. The cultural features (storage pits, other types of pits, hearths, baking pits, etc.), associated artifactual materials, and the patterning of these remains are critical in defining site types through an analysis of the activities represented. Important subsidiary studies will assist in determining site type, as well as overall subsistence patterns, and include floral, faunal, and artifactual data, as discussed below.

2. What artifact assemblages are present at the project sites? What types of tools and manufacture debris are present. What are the relative abundances of the various types? On the basis of the artifacts, what types of activities were performed at the sites? How do these assemblages compare with those from other sites in the region?

Both sites have produced lithic artifacts. LA 29363 has also produced pottery and ground stone. Intensive surface investigation and excavation may produce other artifact types (projectile points, bifaces, ornaments, etc.) as well.

The types of artifacts at a site help define the kinds of activities that took place at each

specific location (component). Manos and metates imply grinding plant foods, projectile points imply hunting, and scrapers imply hide dressing. Multipurpose tools such as hammerstones, awls, and drills, and manufacture debris such as chipped lithic debris, shell fragments, and some types of fragmentary artifacts, imply a host of generalized activities involving the manufacture or maintenance of items associated with day-to-day living. A wide range of artifact and debris types imply a base camp/habitation situation, and fewer artifact and debris types imply special activity sites. The percentages of each category will provide a *very rough* index to the relative frequency of occurrence of each activity at the site.

Caution is required in interpreting the data in this manner because of the effects of tool use-life on artifact assemblage composition (Schlanger 1990). This line of interpretation makes several assumptions about the data and the activities they represent, and the technique greatly simplifies a number of complex variables and conditions.

We will compare the project sites with other sites in the Guadalupe-Carlsbad region. Sites to be used in this comparison include cave, shelter, and open sites investigated by the Katzes (1985a) and Southern Methodist University (Henderson 1976; Gallagher and Bearden 1980; Roney 1985; Applegarth 1976).

3. What plants and animals were being processed or consumed at the project sites? What biotic communities were being exploited? Were the inhabitants of the sites exploiting all available biotic communities or only selected ones? Were cultigens being grown and consumed? During which season or seasons were the sites occupied?

The project sites have the potential of producing burned plant remains and possibly some animal bone. Cooking activities probably took place at both sites, as attested by the probable hearths, baking pit, burned-rock concentrations, and quantities of burned rocks on LA 29363 and by the extensive lithic scatter at LA 29362.

Plant and animal remains recovered at archaeological sites provide first line evidence for reconstructing various aspects of the human food quest. Animal bones and the pollen and charred remnants of plants will be studied to identify the species present and the biotic zones exploited, characterize the diet and food preparation techniques, and provide insights into the effects of taphonomic processes on the archaeological record. Floral and faunal data also have the potential to provide information on season of the year that they were collected or hunted. Although only certain plant and animal remains provide seasonal data, they are very useful in helping define the time of the year the sites were occupied. Since it is unlikely that the data from the project sites constitute a total view of the diet throughout the year or through time, it will be necessary to compare these results with those of other projects in the region to gain a better understanding of the total subsistence system.

As mentioned in an earlier section of this document, it is imperative that we establish whether or not domestic plants were grown in the Guadalupe-Carlsbad region. Leslie's (1979) assessment of the structural sites in the vicinity of Hobbs in far southeastern New Mexico, though without benefit of flotation and pollen recovery techniques, suggests that corn was not being grown east of the Pecos River within New Mexico. The WIPP Project (Lord and Reynolds 1985), located between Leslie's sites and the Pecos River, excavated three nonstructural sites but failed to find evidence of cultigens in flotation and pollen samples. On the other hand, corn was clearly being grown within the Pecos Valley at Roswell (Kelley 1984, Appendix 6; Rocek and Speth 1986;

Wiseman 1985) and probably near Fort Sumner as well (Jelinek 1967). Thus, if cultigens are documented for the project sites, then the relative quantities may help us determine if the site occupants were farmers or full-time hunter-gatherers. Relatively large numbers of domestic remains would indicate that the people were farmers. Small amounts of cultigens would be less clear, for hunter-gatherers could have obtained them in trade from farmers.

4. What exotic materials or items at the sites indicate exchange or mobility?

Intensive surface investigation and excavation at the two sites may produce examples of imported materials. At the present time, some scholars also believe that all pottery is intrusive to the Seven Rivers region in that it was produced in the Sierra Blanca and traded into Seven Rivers. Since exotic or trade materials are by their very nature generally few in number in any site, concerted effort will be made to recover them.

Materials and artifacts not naturally available in a region are indicative of either exchange relationships with other people or a mobility pattern that permits a group to acquire these items during their yearly round. Judging which situation is applicable to the project sites is difficult and will require careful comparison with data from the Roswell region. If we can determine whether the site occupants acquired the goods through trade or by direct access, we will gain perspective on the territory they used and therefore on the identity of the people themselves.

The absence of exotic materials is another matter entirely. In small sites and sites of short occupation, the absence of exotics can be misleading simply because such items may not have had time to find their way into the archaeological record. Or, perhaps the occupants simply did not acquire exotic materials. But this is precisely where comparisons with other assemblages in the region and the long-term accumulation of excavation data from numerous sites, both large and small and of all types, is necessary for acquiring perspective and, eventually, resolving the problem.

5. What are the dates of occupation at the various project sites?

Since it is likely that the sites were occupied on one or more occasions during the prehistoric period, dating individual features and components is crucial. At the individual feature level, we need to determine which are contemporaneous (or approximately so) and which are not. This will enable us to define the dates of each component and the activities performed at the different time periods at the sites. This in turn will permit documentation of site and region use through time, whether or not these uses changed through time, and if they did change, the directions, intensity, and, hopefully, the reasons for those changes. Dating information will also permit us to assess the Katzes' chronology, phase sequence, and postulated cultural changes for the Guadalupe-Carlsbad region.

The dating situation is critical in southeastern New Mexico where dendrochronology, the most accurate and preferred dating technique, works poorly or not at all (W. Robinson, pers. comm. 1975). Few absolute dates derived by other techniques are currently available (Sebastian and Larralde 1989). Recent advances in radiocarbon dating make it the most viable technique for southeastern New Mexico at the present time. Obsidian hydration and thermoluminescence have been tried in the region, but because these techniques have many problems and are not generally reliable, they will not be used in this study.

During excavation, charcoal will be recovered from as many features and cultural situations as possible. Because of the importance of dating the project sites, we will submit both very small samples (for accelerator mass spectrometry analysis) and bulk samples (carbon-stained sands) for dating if necessary.

SITE-SPECIFIC DATA RECOVERY QUESTIONS

Yvonne R. Oakes

LA 29362

Trojan Hill consists of an extensive lithic artifact concentration focused in two areas on the south side of the proposed highway construction. It is believed to be Archaic. However, contemporaneity of the two concentrations needs to be established through absolute dating methods or by the presence of diagnostic artifacts. Excavation procedures will concentrate on the denser artifact clusters in search of hearths or pits that may contain charcoal for dating. Flotation and pollen samples will aid in determining the subsistence items utilized on the site and the season of site use.

The presence of a large number of lithic artifacts will help in determining the activities performed at the site and provide a functional site classification. If the site is Archaic, a large proportion of the lithic assemblage may be biface flakes. Efforts to carefully retrieve such flakes will be made through the use of smaller-sized screens, if necessary. No sherds should be associated with any Archaic features.

We also need to determine if the site is characterized by a single use episode or is a result of multiple occupations. If the site represents a palimpsest of Archaic activities over time, any retrieved dates may exhibit a relatively wide rather than narrow time frame. Our understanding of Archaic mobility patterns are almost unknown for the region. If Archaic peoples are fully mobile, we would expect expedient investment of labor in hearths, storage facilities, and dwellings. The presence or absence of exotic materials will tell us considerably about Archaic mobility and exchange networks. Domestication of cultigens would not be likely. If site occupants maintained a seasonal round between the riverine environment of the Pecos River and the Guadalupe Mountains, only seasonal subsistence resources should be present in the archaeological record. In addition, a highly mobile group would not be expected to produce long-term storage facilities (as stated above); however, temporary facilities for the gathering and holding of specific food items while awaiting processing might be present.

LA 29362 may represent a foraging locale probably used repeatedly over time by Archaic populations. Hearths should be extramural and exhibit expedient preparation, although many may be scattered over the site. These could also be evidence of some specialized activity at the site, such as rock quarrying, gathering of specific wild food, or hunting for game. The numerous lithic artifacts and lack of subsurface materials spread along the ridge would suggest repeated encampment of a very short term by the same or similar cultural group.

Broad areas of the site will be surface stripped to the former prehistoric surface in order to recover any hearth or pit areas. Any soil found in these features will be retrieved for macrobotanical and palynological analyses. Dating of features is a priority. In the absence of datable materials, the lithic artifacts will be examined for known Archaic attributes, e.g. high frequencies of biface thinning flakes. Screen measuring ⅛-inch will be used in order to retrieve any small lithic items.

Given that pits and thermal features are present at LA 29363, we propose that the area served as a locale for the temporary collecting of subsistence items. The presence of ground stone indicates that processing of materials occurred on the site.

Macho Dunes has many discrete blow-outs containing cultural material within the dunal topography. While ceramics post-dating A.D. 800 were recovered from several of them, not all locales contained sherds. This could indicate an earlier and repeated use over a long period of time for this site. Determining temporality for the many cultural proveniences within the proposed right-of-way is important for understanding periods of site use and various site functions. The patterning of cultural features within the dunes is also critical to understanding cultural associations of the various blow-out locales.

The presence of possible residential pit structures is very important because such features are rare in the Carlsbad area and would provide a major step toward understanding residential mobility patterns during the Globe phase. The roasting pit in another provenience could provide much needed subsistence data and information on seasonality of use of the area. Surfaces around these and all excavated features will be carefully traced in order to recover all associated components.

While it is assumed that all ceramics are intrusive to the Carlsbad region, petrographic analysis of all, or a sample of, the recovered sherds should determine the presence of local or exotic tempers and help to resolve the issue of whether all ceramics are intrusive. Because this issue has not been definitively decided, an OAS ceramic expert will visit the site region in search of potential clay and tempering resources. Recovered ceramics will also be used to evaluate the validity of placing the site within the Globe phase (or Formative period; Katz and Katz 1993).

Ground stone in several discrete locations on the site indicates the processing of subsistence items, possibly mesquite products, or grasses. It is also possible that corn was grown nearby and processed on the site. Pollen washes from ground stone and soil samples may inform on the potential use of domesticates.

If LA 29363 is a ceramic period collecting area, used possibly as a temporary campsite, then pits, hearths, grinding stones, and food containers should be present. The presence of possible temporary residential pit structures would probably indicate a base camp area. Interior hearths within structures would suggest a winter occupation period.

Every attempt will be make to locate all cultural features and retrieve macrobotanical and palynological samples from these. Datable materials will also be recovered, if possible. Spatial plotting of artifacts around features will assist in determining function of the feature and in assigning a time frame to the feature.

FIELD AND ANALYSIS METHODS

Yvonne R. Oakes

The following standard field and analysis techniques will be used to extrapolate the specific structural and temporal data required by the research design. These include an accurate chronometric ordering of the sites through radiocarbon analysis and possibly archaeomagnetic sampling or dendrochronology. Determination of time frames for each site is important for dating the time of use of site resources, possibly including cultigens, by site occupants. The data recovery plan also commits us to examine site structure in terms of expedient versus reuse or long-term use. We plan on collecting sufficient macrobotanical and palynological samples to assess subsistence adaptations. These will be taken from the fill and floors of structural units. The chronometric data will be taken from burned structural material, hearths, and pit fill, if possible. Ceramic artifacts will also be used to assign the dates of sites and to assist in assessing site function.

Field Methods

Datums set during the testing program will be reestablished and north-south and east-west baselines will be run from these. These will provide the coordinates for a 1-by-1-m grid system to be imposed over each site. Elevations will be taken from the northwestern corner of each plotted grid with a transit and stadia rod in order to maintain horizontal control. Surface collections and excavation units will be made from within this grid system. Hand tools such as trowels, shovels, picks, brushes, and dental picks will be used for the excavation of cultural material and features. Mechanical equipment will be used at LA 29363 only after hand excavations have uncovered all possible cultural features or prehistoric use surfaces. Dunal overburden will be removed in increments from those portions of the site adjacent to extant cultural features or surfaces. The work will be performed by a qualified backhoe operator, Alley Cat, who specifically deals in archaeological excavations throughout New Mexico and Arizona.

Excavation units will first be placed within known cultural features. They will be dug in 10-cm arbitrary levels unless natural or cultural stratigraphic breaks are evident. If natural breaks are defined, excavations will continue in levels determined by the depth of the strata. The excavation units will be expanded out from the exploratory grids to determine the nature and extent of any cultural deposits and features that are encountered. Surface stripping will be used to ensure that all subsurface features will be found.

Soil recovered from all excavation and surface stripping procedures will be screened through ¼-inch mesh hardware cloth at LA 29362, and all artifacts will be bagged by level. If, at LA 29363, ⅛-inch mesh does not recover any small biface flakes in the early excavation stages, screening will switch to ¼-inch mesh. Artifacts recovered from use surfaces or floors will be mapped in place and bagged separately. Pollen and flotation samples will be collected from all middens, floors, cultural fill, or other use surfaces.

Soil augers will be used to investigate areas of the sites where artifact densities are very low. Any artifacts collected in this manner will bagged by depth and saved for later analysis. Subsurface cultural deposits encountered in any auger tests will be further examined through grid excavations or trenched mechanically to determine their extent.

We will attempt to locate all site features through the above methods. Individual field forms will be filled out for each level excavated, detailing depth of level, type and amount of artifacts recovered, and soil type and color based on the Munsell scale.

All stratigraphic levels and feature cross sections will be drawn along with plan views of each feature. Features will be photographed before and after excavation. The site, including all cultural features, locations of excavation units, and topographic changes will be mapped with a transit and stadia rod.

If human remains (including any associated burial goods) are encountered, excavations of the area will cease and their disposition will be based on consultations with the Mescalero Apache Tribe carried out in accordance with the Native American Graves Protection and Repatriation Act of 1980 (NAGPRA) through cooperation with the Bureau of Land Management. The Museum of New Mexico Rule 11 as amended April 2, 1991 ("Collection, Display, and Repatriation of Culturally Sensitive Materials") will also be followed. No disposition of the remains will be completed until the wishes of the Mescalero Apache Tribe are known. Unless an alternative disposition is established through the consultation process, the remains will be submitted to the Museum of New Mexico Archeological Repository for physical storage at the Department of Anthropology, University of New Mexico. Remaining artifacts will be submitted to the Archeological Repository for physical storage.

Laboratory Analysis

Laboratory analysis will be conducted by the staff of the Office of Archaeological Studies and specialized professional consultants. When brought in from the field, artifacts will first be washed, sorted, and catalogued. Any remains that do not appear to be stable will be treated in consultation with the Museum's conservation department.

Ceramic Artifacts

To assign dates, function, and cultural affinity to the ceramic artifacts, a detailed analysis of morphological attributes will be undertaken. Artifacts will be identified by existing type name, vessel and rim form, vessel diameter, paste texture and color, temper material, surface color and finish, slip, design style, thickness, presumed function, and presence of attributes such as burning, smudging, mending, or reworking. A binocular microscope will be used to facilitate the analysis. Depending on assemblage size, a sample of sherds of each type will be submitted for petrographic analysis to determine the origin of the sherds. Clay and temper sources for pottery production will be sought during the field excavations and matched with sherd samples in the laboratory to determine the locus of production for ceramics because of the likelihood of them being produced in other regions. Ceramics from dated sites in the nearby region will be compared with recovered ceramics from this project to gain a finer resolution of dates for ceramics produced during the Formative period.

Lithic Artifacts

Lithic artifacts may vary considerably between the two time periods represented by the sites. In

order to separate and define difference, lithic artifacts will be analyzed for material type and texture, artifact type, breakage patterns, use, and presence of thermal treatment. Attributes to be monitored with the formal and informal tools include edge angle and shape, type of modification and/or wear. A binocular microscope will be used to identify retouch and wear patterns. Because there may be differences between the sites in the way local materials were reduced, debitage will be examined for evidence of reduction strategy, reduction stage, platform type, percentage of dorsal cortex, platform lipping, artifact portion, direction of dorsal scarring, and size. These studies should allow an evaluation of reduction technology, tool production and use, and raw material procurement strategies. For example, a curated reduction strategy should be evident in the Archaic assemblage, while an expedient strategy should characterize the Formative site. Material type and percentage of cortex are of particular importance in determining whether the lithic materials on the sites were locally obtained or represent movement of goods or people to or from nonlocal resource areas. For LA 29362, determining the degree of mobility by site occupants is critical to our general understanding of Archaic adaptations in this region. The frequency and type of tools present on the sites will inform on technologies used (expedient or curated) and allow for some additional assessment of mobility. Specific tasks often require specialized tools; however, in the presence of greater mobility, multifunctional tools may be expected. A specialized analysis will involve the study of biface manufacture for evidence of differential use during the two cultural periods.

Comparison of lithic artifact data with other recently excavated sites in the project vicinity may assist in the identification of specific manufacturing techniques and use patterns that may inform on varying subsistence strategies of differing cultural groups. If these sites are limited duration field camps for the gathering and processing of specific resources, then the lithic assemblage should reflect usage of limited but specific tool types.

Ground stone will be analyzed for material type, morphology, size, manufacture, breakage patterns, evidence of reuse, and evidence of specific processing activities. Grinding implements may indicate, through analysis, whether they were used for wild seed, nut, or fibrous plant processing or used to process corn. Size of the artifacts and material types used may assist in determining mobility patterns of the groups and what resources were exploited.

Faunal Remains

The faunal analysis will focus on the identification of species, age, and bone elements to assist in determining species used as food resources and portions used by the occupants of the two sites. Season of death for faunal remains will be determined for young species, if possible. Butchering and processing methods will be examined. We will also investigate the use of faunal materials as tools. Information from the faunal analysis will be used to aid in the determination of season of occupation on the sites, hunting patterns and dependency, and subsistence strategies pursued.

If these sites are of limited duration, faunal resources sought by site occupants should be focused on specific species available in the region, which should be reflected in the recovered assemblage. Comparisons with faunal material from nearby sites should provide information on types of species available in the region prehistorically and assist in determining patterns of species utilization over time.

Floral Remains

We are seeking to determine which floral resources were utilized by occupants of the two sites, with a particular emphasis on cultigen use. The use of cultigens in southeastern New Mexico has been poorly understood with very little data produced through past archaeological endeavors. One focus will be on obtaining and processing samples that may aid in assessing the role of cultigens in prehistoric dietary regimens in this region.

Floral remains will be identified by specific species when possible and compared with plant data from other sites to determine floral resources used by the various groups. It will also be used to help determine the season of use and subsistence strategy employed at each site. Plant types will identify whether domestication of cultigens was practiced.

Macrobotanical samples will be taken from each level within all excavated features and several nonfeature control samples will also be obtained. A pollen column will be taken from any structures of facilities encountered. Both macrobotanical and palynological samples will be analyzed by specialists. They will specifically look for the presence of cultigen remains within the samples. Pollen analysis will employ Intensive Systematic Microscopy (ISM) developed by Dean (n.d.) to look for possibly rare marker grains of corn pollen.

Human Remains

The main goal of the skeletal analysis, if any, will be a nondestructive study of remains to add to the sparse data base on prehistoric populations from southeastern New Mexico. The analysis will include standard metric studies, aging and sexing of the remains, and documentation of pathologies, particularly those related to food stress. If bone tissue samples are present, these will be submitted for carbon isotope studies to determine the relative proportion of maize in the diet of site populations.

Report Preparation

The final data recovery and analysis report will be published in the Museum of New Mexico's Office of Archaeological Studies *Archaeology Notes*. The report will present the results of the excavations, analysis, and interpretation of the data. It will include photographs, site and feature maps, and data summaries. Field notes and maps, analytic data sheets, and photographs will be deposited with the Archeological Records Management Section of the State Historic Preservation Division, located at the Laboratory of Anthropology in Santa Fe.

REFERENCES CITED

Applegarth, Susan R.
1976 *Prehistoric Utilization of the Environment of the Guadalupe Mountains.* Ph.D. dissertation, Department of Anthropology, University of Wisconsin at Madison.

Aylward, Charles A., and J. Loring Haskell
1981 *Archeological Clearance Report for Eddy County, New Mexico: Proposed Carlsbad Highway Bypass.* New Mexico Archaeological Services, Inc., Carlsbad.

Basehart, Harry W.
1974 Mescalero Apache Subsistence Patterns and Socio-political Organization. *Apache Indians XII.* Garland Publishing Co., New York.

Binford, Lewis R.
1980 Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45:4-20.

Boyd, Douglas E., Jay Peck, and Karl W. Kibler
1993 *Data Recovery at Justiceburg Reservoir (Lake Alan Henry), Garza and Kent Counties, Texas: Phase III, Season 2.* Reports of Investigations No. 88, Prewitt and Associates, Inc., Austin.

Brook, Vernon Ralph
1975 Development of Prehistoric House Types in the Jornada Branch. *Awanyu* 3(4).

Collins, Michael B.
1991 Thoughts on Future Excavation of Burned Rock Middens. In *The Burned Rock Middens of Texas: An Archeological Symposium,* edited by Thomas R. Hester, pp. 1-24. Studies in Archeology 13, Texas Archeological Research Laboratory, University of Texas at Austin.

Dane, Carle H., and George O. Bachman
1965 *Geologic Map of New Mexico.* U.S. Geological Survey, Washington, D.C.

Dean, Glenna
n.d. Finding a Needle in the Palynological Haystack: A Comparison of Methods. In *Proceedings of the 27th Annual Meeting of the American Association of Stratigraphic Palynologists.* Texas A&M University, College Station.

Ferdon, Edwin N., Jr.
1946 *An Excavation of Hermit's Cave, New Mexico.* School of American Research Monograph No. 10, Santa Fe.

Gallagher, Joseph G., and Susan Bearden
1980 *Evaluation of Cultural Resources at Brantley Reservoir, Eddy County, New Mexico.* Southern Methodist University, Archaeology Research Program, Research Report 120.

Greer, John W.
1965 A Typology of Midden Circles and Mescal Pits. *Southwestern Lore* 31(3):41-55. Colorado Archaeological Society, Boulder.

1967 *Notes on Excavated Ring Midden Sites, 1963-1968.* Bulletin of the Texas Archaeological Society, vol. 38, pp. 39-44, Austin.

1968 *Excavations at a Midden Circle Site in El Paso County, Texas.* Bulletin of the Texas Archaeological Society, vol. 39, pp. 111-131, Austin.

Haskell, J. Loring
1981 *Archaeological Clearance Report for Eddy County, New Mexico Proposed Carlsbad Highway Bypass.* New Mexico Archaeological Services, Inc., Carlsbad.

Henderson, Mark
1976 *An Archaeological Inventory of Brantley Reservoir, New Mexico.* Archaeology Research Program Contributions in Anthropology No. 18, Department of Anthropology, Southern Methodist University, Dallas.

Hickerson, Nancy Parrott
1994 *The Jumanos, Hunters and Traders of the South Plains.* University of Texas Press, Austin.

Higgins, Howard C.
1990 *A Site Assessment for Cultural Resource Sites Located Along the Carlsbad Bypass Right of Way.* Mariah Associates, Inc., Albuquerque.

Hokanson, Jeffery H.
1996 *Archaeological Survey Along North Loop Road, Carlsbad, Eddy County, New Mexico.* Lone Mountain Archaeological Services, Inc., Albuquerque.

Howard, Edgar B.
1930 Archaeological Research in the Guadalupe Mountains. *Museum Journal* 21:188-213, University of Pennsylvania.

1932 Caves along the Slopes of the Guadalupe Mountains. *Bulletin of the Texas Archaeological and Paleontological Society* 4:7-19, Austin.

1935 Evidence of Early Man in North America. *Museum Journal* 24(2-3):53-171, University of Pennsylvania.

Jelinek, Arthur J.
1967 *A Prehistoric Sequence in the Middle Pecos Valley, New Mexico.* Anthropological Papers of the Museum of Anthropology no. 31, University of Michigan, Ann Arbor.

Katz, Susana R., and Paul Katz
1985a *The Prehistory of the Carlsbad Basin, Southeastern New Mexico: Technical Report of Prehistoric Archaeological Investigations in the Brantley Project Locality.* Bureau of Reclamation, Southwest Regional Office, Amarillo, Texas.

1985b *The History of the Carlsbad Basin, Southeastern New Mexico: Technical Report of Historic*

Archaeological Investigations in the Brantley Project Locality. Bureau of Reclamation, Southwest Regional Office, Amarillo, Texas.

1993 *An Archaeological Overview of Southeastern New Mexico*. Prepared for New Mexico Historic Preservation Division, Santa Fe [Draft].

Kelley, Jane H.
1984 *The Archaeology of the Sierra Blanca Region of Southeastern New Mexico*. Anthropological Papers of the Museum of Anthropology no. 74, University of Michigan, Ann Arbor.

Lehmer, Donald J.
1948 *The Jornada Branch of the Mogollon*. University of Arizona Bulletin 19(2).

Leslie, Robert A.
1979 The Eastern Jornada Mogollon, Extreme Southeastern New Mexico. In *Jornada Mogollon Archaeology: Proceedings of the First Jornada Conference*, edited by P. H. Beckett and R. N. Wiseman, pp. 179-199. Cultural Resource Management Division, New Mexico State University and the Historic Preservation Bureau, Department of Finance & Administration, Las Cruces and Santa Fe.

Lord, Kenneth J., and William E. Reynolds
1985 *Archaeological Investigations of Three Sites within the WIPP Core Area, Eddy County, New Mexico*. Chambers Consultants and Planners, Albuquerque. Submitted to the U.S. Army Corps of Engineers, Contract No. DACW47-83-D-0069.

Maker, H. J., H. E. Dregne, V. G. Link, and J. U. Anderson
1974 *Soils of New Mexico*. Agricultural Experiment Station Research Report 285, New Mexico State University, Las Cruces.

Mallouf, Robert J.
1985 A Synthesis of Eastern Trans-Pecos Prehistory. Master's thesis, Department of Anthropology, University of Texas at Austin.

Medellin-Leal, Fernando
1982 The Chihuahuan Desert. In *Reference Handbook of the Deserts of North America*, Gordon Bender, editor, pp. 321-381. Greenwood Press, Westport, Connecticut.

Mera, H. P.
1938 *Reconnaissance and Excavation in Southeastern New Mexico*. Memoir no. 51, American Anthropological Association.

1943 *An Outline of Ceramic Developments in Southern and Southeastern New Mexico*. Laboratory of Anthropology, Technical Series 11, Santa Fe.

Moore, James L.
in press *Archaeological Investigation in the Southern Mesilla Bolson: Data Recovery at the Santa Teresa Port-of-Entry Facility*. Archaeology Notes 188, Museum of New Mexico, Santa Fe.

Oakes, Yvonne R.
1985 *An Assessment of Gathering Sites Near Hackberry Lake, Eddy County, New Mexico.* Laboratory of Anthropology Notes No. 305, Museum of New Mexico, Santa Fe.

O'Laughlin, Thomas C.
1980 *The Keystone Dam Site, and Other Archaic and Formative Sites in Northwest El Paso, Texas.* El Paso Centennial Museum, Publications in Anthropology No. 8. University of Texas at El Paso.

Phippen, G. Robert, Jr.
1990 *A Class III Cultural Resource Survey of 11.5 Miles of Proposed Highway Right of Way and Interchanges Located on Private, State, and Bureau of Land Management Lands, Eddy County, New Mexico.* Mariah Associates, Inc., Albuquerque.

Riches, Susan M.
1968 Archaeological Survey of the Eastern Guadalupe Mountains, New Mexico. Master's thesis, Department of Anthropology, University of Wisconsin, Madison.

Rocek, Thomas R., and John D. Speth
1984 *The Henderson Site Burials: Glimpses of a Late Prehistoric Population in the Pecos Valley.* Museum of Anthropology Technical Reports no. 18, University of Michigan, Ann Arbor.

Roney, John
1985 Prehistory of the Guadalupe Mountains. Master's thesis, Department of Anthropology, Eastern New Mexico University, Portales.

Runyon, John W., and John A. Hedrick
1973 *Jornada Pottery Types and Some Intrusives.* Southwest Federation of Archaeological Societies Publication, El Paso.

Schlanger, Sarah H.
1990 Artifact Assemblage Composition and Site Occupation Duration. In *Perspectives on Southwestern Prehistory,* edited by Paul E. Minnis and Charles L. Redman, pp. 103-121. Westview Press, Boulder, Colorado.

Schroeder, Albert H. (Assembler)
1983 The Pratt Cave Studies. *The Artifact* 21(1-4), El Paso Archaeological Society.

Schroeder, Albert H., and Dan S. Matson
1965 *A Colony on the Move: Gaspar Castano de Sosa's Journal, 1590-1591.* School of American Research, Santa Fe.

Sebastian, Lynn, and Signa Larralde
1989 *Living on the Land: 11,000 Years of Human Adaptation in Southeastern New Mexico.* Cultural Resources Series no. 6, New Mexico State Office, Bureau of Land Management, Santa Fe.

Stuart, David E., and Rory P. Gauthier
1981 *Prehistoric New Mexico: Background for Survey.* Historic Preservation Bureau, Department of Finance and Administration, Santa Fe.

Tuan, Yi-Fu, C. E. Everard, J. G. Widdison, and I. Bennett
1973 *Climate of New Mexico,* Revised Edition. New Mexico State Planning Office, Santa Fe.

U.S. Department of Commerce, Weather Bureau
1965 Climatic Summary of the United States Supplement for 1951 through 1960: New Mexico. *Climatography of the United States* no. 86-25, Washington, D.C.

Whalen, Michael E.
1977 *Settlement Patterns of the Eastern Hueco Bolson.* El Paso Centennial Museum, Anthropological Paper 4. University of Texas at El Paso.

Wills, W. H.
1988 *Early Prehistoric Agriculture in the American Southwest.* School of American Research Press, Santa Fe.

Wiseman, Regge N.
1985 Bison, Fish, and Sedentary Occupation: Startling Data from Rocky Arroyo (LA 25277), Chaves County, New Mexico. In *Views of the Jornada Mogollon,* edited by Colleen M. Beck, pp. 30-32. Eastern New Mexico University Contributions in Anthropology vol. 12, Portales.

1996 *U.S. 285 Seven Rivers Project: Plan for Data Recovery at Four Archaeological Sites along South Seven Rivers, Central Eddy County, New Mexico.* Office of Archaeological Studies, Museum of New Mexico, Archaeology Notes 190, Santa Fe.

APPENDIX 2. POLICY ON COLLECTION, DISPLAY AND PREPARATION OF CULTURALLY SENSITIVE MATERIALS

Office of Cultural Affairs
Museum Division
(Museum of New Mexico)
P.O. Box 2087, 113 Lincoln Ave.
Santa Fe, New Mexico 87504

Rule No. 11 POLICY ON COLLECTION, DISPLAY AND REPATRIATION OF CULTURALLY SENSITIVE MATERIALS Adopted: 01/17/91

I. INTRODUCTION

The policy of the Museum of New Mexico is to collect, care for, and interpret materials in a manner that respects the diversity of human cultures and religions.

Culturally sensitive materials include material culture as well as the broader ethical issues which surround their use, care, and interpretation by the Museum. The Museum's responsibility and obligation are to recognize and respond to ethical concerns.

II. DEFINITIONS;

A. "Culturally sensitive materials" are objects or materials whose treatment or use is a matter of profound concern to living peoples; they may include, but are not limited to:

1. "Human remains and their associated funerary objects" shall mean objects that, as a part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later;

2. "Sacred objects" shall mean specific items which are needed by traditional religious leaders for the practice of an ongoing religion by present-day adherents;

3. Photographs, art works, and other depictions of human remains or religious objects, and sacred or religious events; and

4. Museum records, including notes, books, drawings, and photographic and other images relating to such culturally sensitive materials, objects, and remains.

B. "Concerned party" is a museum-recognized representative of a tribe, community, or an organization linked to culturally sensitive materials by ties of culture, descent, and/or geography. In the case of a federally recognized indian tribe, the representative shall be tribally-authorized.

C. "Repatriation" is the return of culturally sensitive materials to concerned parties. Repatriation is a collaborative process that empowers people and removes the stigma of cultural paternalism which hinders museums in their attempts to interpret people and cultures with respect, dignity, and accuracy. Repatriation is a partnership created through dialogue based upon cooperation and mutual trust between the Museum and the concerned party.

D. The Museum of New Mexico's Committee on Sensitive Materials is the committee, appointed by the Director of the Museum of New Mexico, that shall serve as the Museum of New Mexico's advisory body on issues relating to the care and treatment of sensitive materials.

III. IDENTIFICATION OF CONCERNED PARTIES

A. The Museum shall initiate action to identify potentially concerned parties who may have an interest in culturally sensitive material in the museum's collections.

B. The Museum encourages concerned parties to identify themselves and shall seek out those individuals or groups whom the Museum believes to be concerned parties.

C. The Museum's sensitive materials committee shall review all disputed individual claims of concerned-party status in consultation with the tribe, community, or organization which the individual(s) claims to represent. The Museum's sensitive materials committee shall assist, when necessary, in designating concerned parties who have an interest in culturally sensitive materials contained in the collections of the Museum of New Mexico.

D. The Museum shall provide an inventory of pertinent culturally sensitive materials to recognized concerned parties.

E. The Museum shall work with concerned parties to determine the appropriate use, care and procedures for culturally sensitive materials which best balance the needs of all parties involved.

IV. IDENTIFICATION AND TREATMENT OF CULTURALLY SENSITIVE MATERIALS

A. Within five years of the date of adoption of this policy, each Museum unit shall survey to the extent possible (in consultation with concerned parties, if appropriate) its collections to determine items or material which may be culturally sensitive materials. The Museum unit shall submit to the Director of the Museum of New Mexico an inventory of all potentially culturally sensitive materials. The inventory shall include to the extent possible the object's name, date and type of accession, catalogue number, and cultural identification. Within six months of submission of its inventory to the Director of the Museum of New Mexico, each Museum unit shall then develop and submit, a plan to establish a dialogue with concerned parties to determine appropriate treatment of culturally sensitive items or materials held by the unit.

B. As part of its treatment plans for culturally sensitive materials, the Museum reserves the right to restrict access to, or use of, those materials to the general public. The Museum staff shall allow identified concerned parties access to culturally sensitive materials.

C. Conservation treatment shall not be performed on identified culturally sensitive materials without consulting concerned parties.

D. The Museum shall not place human remains on exhibition. The Museum may continue to retain culturally sensitive materials. If culturally sensitive materials, other than human remains, are exhibited, then a good-faith effort to obtain the advice and counsel of the proper concerned party shall be made.

E. All human skeletal remains held by the Museum shall be treated as human remains and are de facto sensitive materials. The Museum shall discourage the further collection of human remains; however, it will accept human remains as part of its mandated responsibilities as the State Archaeological Repository. At its own initiation or at the request of a concerned party, the Museum may accept human remains to retrieve them from the private sector and furthermore, may accept human remains with the explicit purpose of returning them to a concerned party.

IV. REPATRIATION OF CULTURALLY SENSITIVE MATERIALS

A. On a case-by-case basis, the Museum shall seek guidance from recognized, concerned parties regarding the identification, proper care, and possible disposition of culturally sensitive materials.

B. Negotiations concerning culturally sensitive materials shall be conducted with professional discretion. Collaboration and openness with concerned parties are the goals of these dialogues, not publicity. If concerned parties desire publicity, then it will be carried out in collaboration with them.

C. The Museum shall have the final responsibility of making a determination of culturally sensitive materials subject to the appeal process as outlined under section VII A.

D. The Museum of New Mexico accepts repatriation as one of several appropriate actions for culturally sensitive materials only if such a course of action results from consultation with designated concerned parties as described in Section III of this policy.

E. The Museum may accept or hold culturally sensitive materials for inclusion in its permanent collections.

F. The Museum may temporarily accept culturally sensitive materials to assist efforts to repatriate them to the proper concerned party.

G. To initiate repatriation of culturally sensitive materials, the Museum of New Mexico's current deaccession policy shall be followed. The curator working with the concerned party shall complete all preparations for deaccession through the Museum Collections Committee and Director before negotiations begin.

H. Repatriation negotiations may also result in, but are not limited to, the retention of objects with no restrictions on use, care, and/or exhibition; the retention of objects with restrictions on use, care and/or exhibition; the lending of objects either permanently or temporarily for use to a community; and the holding in trust of culturally sensitive materials for the concerned party.

I. When repatriation of culturally sensitive materials occurs, the Museum reserves the right to retain associated museum records but shall consider each request for such records on an individual basis.

VI. ONGOING RECOVERY OR ACCEPTANCE OF ARCHAEOLOGICAL MATERIALS

A. In providing sponsored archaeological research or repository functions, the Museum shall work with agencies that regulate the inventory, scientific study, collection, curation, and/or disposition of archaeological materials to ensure, to the extent possible under the law, that these mandated functions are provided in a manner that respects the religious and cultural beliefs of concerned parties.

B. When entering into agreements for the acceptance of, or continued care for, archaeological repository collections, the Museum may issue such stipulations as are necessary to ensure that the collection, treatment, and disposition of the collections include adequate consultation with concerned parties and are otherwise consistent with this Policy.

C. In addition to the mandated treatment of research sites and remains and in those actions where treatment is not mandated, defined, or regulated by laws, regulations, or permit stipulations, the Museum shall use the following independent guidelines in recovering or accepting archaeological materials:

1. Prior to undertaking any archaeological studies at sites with an apparent relationship to concerned parties, the Museum shall ensure that proper consultation with the concerned parties has taken place.

2. When so requested by concerned parties, the Museum shall include an observer, chosen by the concerned party, in the crew of an archaeological study.

3. The Museum shall not remove human remains and their associated funerary objects or materials from their original context nor conduct any destructive studies on such remains, objects, and materials, except as part of procedures determined to be appropriate through consultation with concerned parties, if any.

4. The Museum reserves the right to restrict general public viewing of in situ human remains and associated funerary objects or items of a sacred nature and further shall not allow the public to take or prepare images or records of such objects, materials, or items, except as part of procedures determined to be appropriate through consultation with concerned parties. Photographic and other images of human remains shall be created and used for scientific records only.

5. The Museum reserves the absolute right to limit or deny access to archaeological remains being excavated, analyzed, or curated if access to these remains would violate religious practices.