MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

U.S. 84 SUNSHINE VALLEY: THE TESTING OF THREE SITES SOUTHEAST OF SANTA ROSA, NEW MEXICO

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ADMINISTRATIVE SUMMARY

Between October 30 and November 10, 1994, the Office of Archaeological Studies, Museum of New Mexico, conducted limited archaeological testing at three sites on U.S. 84 southeast of Santa Rosa, Guadalupe County, New Mexico. Limited testing at LA 105817, LA 57152, and LA 103315 was conducted at the request of the New Mexico State Highway and Transportation Department (NMSHTD), to determine the extent and importance of cultural resources present as part of the proposed improvements along a 12.8-km (8 miles) stretch of U.S. 84 southeast of Santa Rosa, New Mexico (Levine 1994). LA 103315 is on private and NMSHTD-aquired land. The other two sites (LA 105817 and LA 57152) are on State Trust Land.

All three sites are surface lithic artifact scatters, and probably represent temporary or seasonal camping locations. No intact features were found on any of the sites associated with site occupation or use. In all three cases the data potential of the portions of the sites within the project area was determined to be minimal beyond that already documented, and no further investigations are recommended.

MNM Project 41.589
NMSHTD Project No. NH-084-1(10)18
CPRC Archaeological Survey Permit No. SP-146
New Mexico State Land Office Survey Permit No. 93/027
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INTRODUCTION

At the request of William L. Taylor, Environmental Program Manager, New Mexico State Highway and Transportation Department (NMSHTD), a limited testing program was conducted at three sites (LA 105817, LA 57152, and LA 103315), located on U.S. 84 near Santa Rosa, New Mexico (Fig. 1). LA 103315 is on private land and state land administered by the NMSHTD. The other two sites are located on State Trust Land. Limited testing was conducted under CPRC Archaeological survey permit No. SP-146, and New Mexico State Land Office Survey Permit No. 93/027. Field work was carried out between October 30 and November 10, 1994, conducted by Peter Y. Bullock, assisted by Joy Beasley, Heather Bixler, and Jennifer Noble. Sherry Butler served as a volunteer. Timothy D. Maxwell acted as principal investigator. Figures and artifacts were drafted by Robert Turner, the report was edited by Robin Gould, and photographs were printed by Nancy Warren.

Limited testing was conducted at LA 105817, LA 57152, and LA 103315 to determine the extent and importance of the portion of the sites within the proposed project limits. The testing was restricted to the proposed project corridor of planned improvements to U.S. 84, southeast of Santa Rosa, Guadalupe County, New Mexico. Exact site location information is contained in Appendix 1 (removed from copies in general circulation).

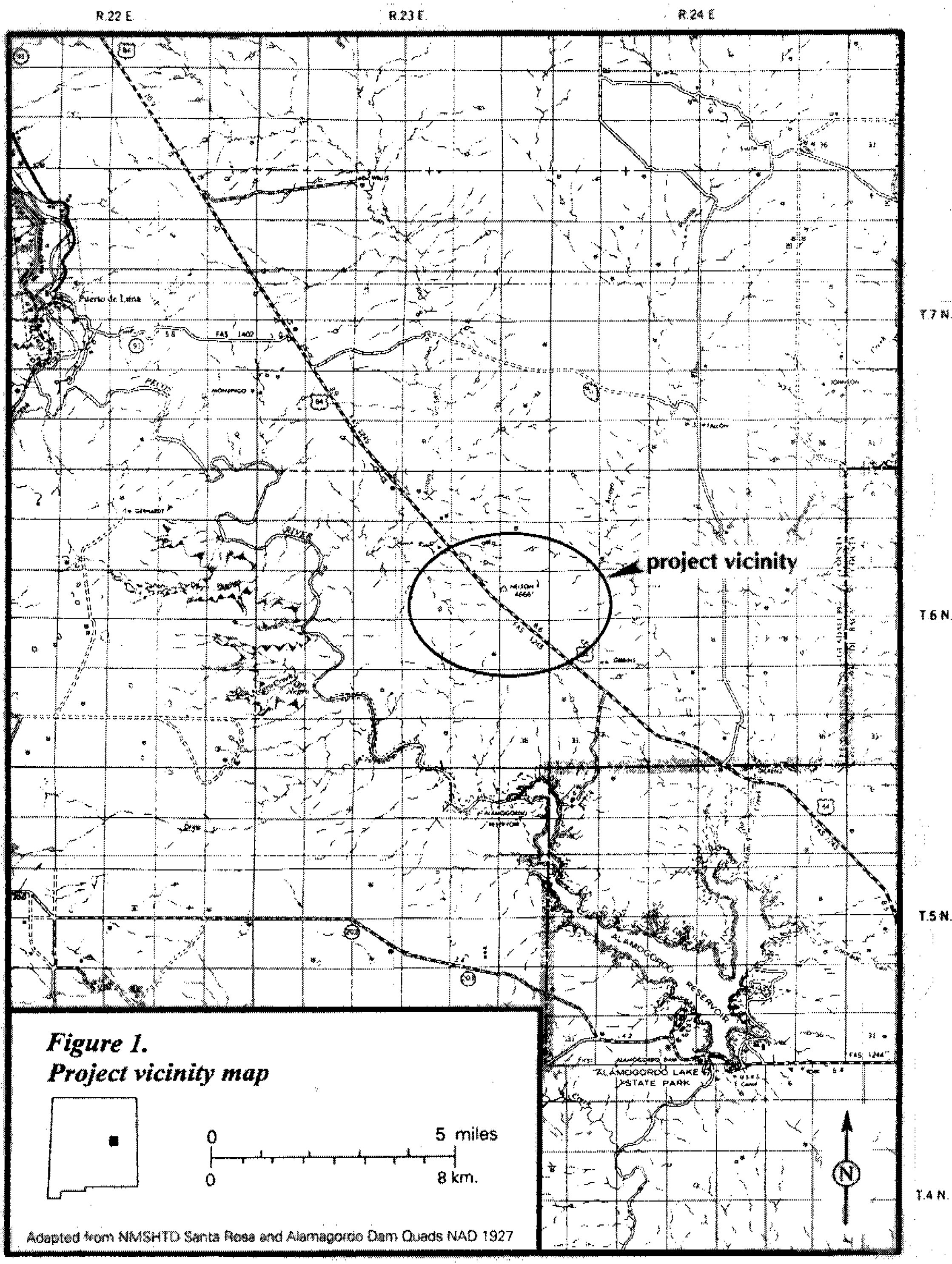

Figure 1.
Project vicinity map

Adapted from NMSHTD Santa Rosa and Alamagordo Dam Quads NAD 1927

ENVIRONMENT

The project locale is in an area bounded by the Pecos River on the west. The northern three-quarters of the project area is bounded on the east by San Juan de Díos Arroyo, which then crosses the project area. The northern portion of the project area is located within the San Juan de Díos Arroyo drainage area. Elevation within the project area ranges from 1,414.1 m (4,670 ft) in the north to 1,348.7 m (4,454 ft) in the south. This area south of Santa Rosa is primarily rolling mixed grassland. Occasional outcrops of exposed sandstone and shale occur, principally on the tops of ridges. This exposed bedrock forms an area of breaks along the edge of the San Juan de Díos Arroyo drainage. The area supports a cover of mixed grasses, with juniper-parkland present in rocky areas and slopes. Common invasive species include mesquite, cholla, and narrow leaf yucca.

Geology

Guadalupe County forms part of the Great Plains physiographic province (Jelinek 1967:35). The terrain is characterized by broad plains dipping gradually eastward. In this region of the southern plains, this eastward dip ends where it comes into contact with the caprock of the Llano Estacado.

The Pecos River is approximately 1.6 km (1.0 miles) to the west of U.S. 84. This is a two-tiered canyon system comprising the oldest portion of the Pecos River Valley, predating the major course shift to the south of the middle Pecos River in the late Pleistocene (Jelinek 1967:5). This portion of the river valley varies in width and is lined for most of its length by broken cliffs of the second river terrace, formed of sandstone from the Santa Rosa and Chinle Formations (Lucas et al. 1985:172-173). Away from the cliff edges, these Triassic sandstones are buried in most places by Pleistocene sands and gravels (Kues et al. 1985:64).

Processes of solution have promoted a karst topography along the Pecos Valley. Water acts on underlying beds of gypsum and limestone, causing the collapse of the surface sandstones and shales of the Santa Rosa Formation (Lucas et al. 1985:172). The resulting sinkholes feed surface runoff into the Pecos River and numerous springs and seeps present along the Pecos River terraces (Levine and Mobley 1976:11).

Soils within the project area are characteristic of the Haplargids-Torriorthents-Calcirorthids Association (Maker et al. 1974:67-68). Widely distributed, this association is dominated by gently rolling or undulating topography with widely spaced small steep escarpments, buttes, and rocky outcrops. This soil association is characterized by a thin brown to reddish brown noncalcareous fine loam topsoil, usually underlain by a light reddish brown or pink limey loam. Soils are deep, and formed of generally medium to fine alluvial and eolian sediments. These soils tend to be susceptible to erosion where vegetation cover is depleted or removed, with gullies and arroyo cutting frequently taking place. Areas of this soil association are usually utilized as rangeland, primarily supporting mixed grasses and mesquite (Maker et al. 1974:67-68).

Soils of the Camborthids-Calciorthids Association dominate the southern portion of the project area located within the San Juan de Díos Arroyo drainage. The topography of this association is varied, ranging from level or gently sloping broad valley areas, to steep escarpments and breaks. Soils are characterized by moderate to deep alluvial deposits. Topsoils are generally light brown to light reddish brown fine sandy loan. Subsoils are a reddish brown calcareous sandy loam containing a weak lime zone. These soils are moderately to highly susceptible to erosion. Gullies are common within valley bottoms. This association is used as rangeland, with variable vegetation coverage (primarily mixed grasses) resulting in a highly variable use capability (Maker et al. 1974:70-71).

Climate

The climate of the project area is typical of eastern New Mexico. This climate is characterized as steppe or desert grassland (Castetter 1956:256, fig. 1). The project area is mixed juniper parkland-mixed grassland. During the Pleistocene, this area is likely to have been mixed deciduous-pine woodland (Brunswig 1992:11-13). Although the amount of available moisture appears to have fluctuated repeatedly through the Archaic period, the overall trend for the region as been toward an overall dryer regime with a summer dominated rain pattern (Sebastian and Larralde 1989:16, fig. 1.9). In this area of New Mexico most precipitation occurs in the form of summer showers, with winter snow providing lesser amounts of precipitation (Tuan et al. 1973:24, fig. 6). Annual precipitation in Santa Rosa averages 35 cm (13.8 inches) (Gabin and Lesperance 1977:148-149; Tuan et al. 1973:18, fig. 2). The average number of frost free days totals 200 (Tuan et al. 1973:87, fig. 38). South to southwesterly winds averaging 10 miles an hour are prevalent throughout the year (Maker et al. 1974:6-7).

Flora and Fauna

The close presence of the Pecos River Valley puts the project area within the Woodland Biome (Castetter 1956:256, fig. 1). In reality the project area is in an ecotone of mixing between the Woodland Biome and the Mixed Grass Biome. Vegetation differences in this area are conditioned by soil and geological type of formation rather than climatic variation. Within the project area, juniper parkland is present in areas of rocky and gravelly knolls, rough broken areas, and north-facing slopes where grasses are poorly developed. The Mixed Grassland Biome exhibits a uniform physiography and vegetative character, with differences in relative vegetation composition resulting from climatic, topographic, and soil variation (Castetter 1956:266). Grassland is present in areas of medium to fine soils penetrable by grass root systems (Castetter 1956:271). In this area the Mixed Grassland Biome is dominated by short grass prairie climax vegetation (Levine and Mobley 1976:3). Grasses common to the project area include little bluestem, blue grama, sideoats grama, and sand dropseed. Snakeweed, cholla, and mesquite are common shrubs (Maker et al. 1974:67).

Faunal populations vary according to their habitats and local climatic and geological variations. These habitats tend to correspond with local plant communities. The number of plant communities in proximity to the project area suggests a range of faunal occurrence greater than that characteristic for any single specific vegetation zone. Faunal species characteristic of the project area include jackrabbit, cottontail rabbit, prairie dog, and assorted small rodents such as mice, ground squirrels, and gophers. Larger faunal species common to the area include antelope, badger, and coyote. Deer and bobcat are also characteristic, but are less common species occurring in the area. Historically, bison were also common in the southern plains adjacent to the Pecos River Valley (Levine and Mobley 1976:16-17).

CULTURAL RESOURCES OVERVIEW

A detailed reconstruction of the cultural history of east-central New Mexico is beyond the scope of this report. Regional summaries are available for the area (Harlan et al. 1986; Levine and Mobley 1975).

Paleoindian Period

The Paleoindian period (10,000-5500 B.C.) was first recognized in 1926 at the Folsom site in northeastern New Mexico (Wormington 1947:20). A series of Paleoindian traditions have since been defined, beginning with Clovis and continuing through Plano (Stuart and Gauthier 1981:294-300). Originally defined on the plains of eastern New Mexico, the Paleoindian cultural area has since been expanded to include virtually all of North America. Although originally believed to be dependent on big-game hunting, the importance of plant-gathering and small animal hunting to Paleoindian subsistence is now recognized (McGregor 1965:120; Willey 1966:38; Jennings 1968:78-79; Wilmsen 1974:115; Cordell 1979:19-21; Stuart and Gauthier 1981:31-33).

Paleoindian sites of any period are rare, but Paleoindian sites are recorded in the region, including the Clovis type site of Blackwater Draw, Locality No. 1, and Blackwater Draw, El Llano. Few sites have been recorded in the general Santa Rosa area. Distinctly shaped Paleoindian projectile points have been found, but usually as isolated finds. One isolated Clovis projectile point base has been recorded for the Pecos River Valley, just to the northwest of the project area (Bullock 1995). Other Paleoindian sites are probably present, buried under alluvial or eolian deposits (Cordell 1982).

Archaic Period

The Archaic occupation of the upper Pecos River Valley appears to have lasted quite late. Levine and Mobley (1976) define the Archaic occupation of northeastern New Mexico as lasting from 5000 B.C. until about A.D. 1000, but a local chronology has not been developed for this area. Projectile points in eastern New Mexico have been identified under a number of different schemes, including those of the Oshara Tradition (Irwin-Williams 1984), and chronologies used in central and western Texas (Johnson 1967).

The Archaic period is best defined in western New Mexico where it is generally referred to as the Oshara Tradition (Irwin-Williams 1973). This period is distinguished by distinctive projectile points and lithic artifact scatters, including grinding implements, fire-cracked rock, and a lack of ceramics. Archaic subsistence adaptations are based on a highly mobile broad based economy characterized by a combination of seasonally scheduled hunting and gathering activities. The Oshara Tradition is divided into five phases: Jay (5500-4800 B.C.), Bajada (4800-3200 B.C.), San Jose (3200-1800 B.C.), Armijo (1800-800 B.C.), and En Medio (800 B.C.-A.D. 400)(Irwin-Williams 1973). Although centered in the northwestern area of New Mexico, Oshara Tradition projectile points do occur as isolated finds as far east as the project area.

A sequence of projectile points for central and western Texas was developed by Johnson

(1967) based on stratified sites yielding radiocarbon dates. This sequence is divided into five overlapping periods: Period I (8350-4800 B.C.) characterized by Luna and Plainview projectile points; Period II (6810-1315 B.C.) characterized by Early Barbed, Pandale, Nolan, Travis, and Bulverde projectile points; Period III (4850 B.C.-A.D. 110) characterized by Shumla, Almagre, Langtry, Pedernales, and Montell projectile points; Period IV (350 B.C.-A.D. 1245) characterized by Ensor, Frio, Darl, Figuero, and Godley projectile points; and Period V (A.D. 50-1710) characterized by Scallorn, Livermore, Bonham, and Perdiz projectile points. In a number of cases the same projectile point morphologies have been given different names based on location. Additional chronologies, including a localized sequence for the lower Pecos River Valley, have also recently been developed (Regge Wiseman, pers. comm.1993).

Pueblo Period

Evidence of Puebloan use of the Santa Rosa area is abundant, although no Pueblo sites with residential architecture have been recorded. The closest recorded pueblos to the Santa Rosa area are located at Pintada Canyon, approximately 32 km (20 miles) to the west. The Puebloan sites at Pintada appear to date from A.D. 1200 to 1400. Ceramic assemblages are dominated by Chupadero Black-on-white and brown utilitarian wares (Stuart and Gauthier 1981). Pueblo ceramics are found in association with open air sites, lithic artifact scatters, and rockshelters along the Pecos River, side canyons, and along some main arroyos. The occasional occurrence of other ceramic types indicates both regional trade, and possible use of the area by Pueblo groups from the Glorieta Mesa and Galisteo Basin areas. Sites associated with Puebloan use of the Pecos River Valley have been recorded for the western side of the Pecos River, opposite the project area (Hannaford 1976), and from the Los Esteros Lake area (Levine and Mobley 1976).

Jornada Mogollon ceramics also occur in the Santa Rosa area, with a number of possible Jornada Mogollon sites recorded (Harlan et al. 1986:42; Levine and Mobley 1974). None of the sites recorded for the Santa Rosa area are known to have structures present, although they are recorded to the south (Corley 1965), in the area of Ft. Sumner (Jelinek 1967:119-124).

A local Pueblo traditional sequence is documented for the middle Pecos River Valley by Jelinek (1967). This tradition seems to develop in the late A.D. 800s out of the Jornada Mogollon. Anasazi, or Anasazi-derived, ceramics appear in the middle Pecos River Valley after A.D. 900 with the development of the Mesita Negra phase (Jelinek 1967:64-65). The presence of these structural sites suggests the gradual spread of sedentary subsistence based on maize agriculture east from the centers of both the Mogollon and Anasazi traditions. The eastern limits of this probably marginal area appear to have been the Pecos Valley (Jelinek 1967:145-147). These developmental sequences continue until the termination of Crosby phase in the lower middle Pecos Valley between A.D. 1250 and 1300, and the termination of the Late McKenzie phase in the upper middle Pecos Valley about A.D. 1300 (Jelinek 1967:65-67).

Plains Indian Occupation

Both Kiowa and southern Athapaskan groups appear to have moved into the eastern portion of New Mexico during the late protohistoric period. Apachean sites are scattered throughout southeastern New Mexico as well as the central plains, and may date anywhere from the late 1400s to the late 1800s (Harlan et al. 1986:52).

Shoshonean-speaking Comanches moved in the southern plains about 1700-1715. Most other Native American groups were driven from the area by these horse-mounted buffalo hunters, except for the closely politically allied Kiowas. Extermination of the buffalo herds combined with American military campaigns removed the Comanches, Kiowas, and other "Plains Indian" groups from the southern plains by 1875 (Schemer 1981). Sites identified as possibly Apache, Comanche, or other "Plains Indian" have been identified north of the project area at Los Esteros Lake (Levine and Mobley 1975).

Hispanic Occupation

The Hispanic presence on the eastern plains of New Mexico was minor prior to the American era. The presence of mobile and potentially hostile Apache, and later Comanche and Kiowa Indians prevented Hispanic settlement along the upper Pecos until after the arrival of American control in the 1850s. By 1860, 16 Hispanic settlements had been built on Pecos River land grants (Harlan et al. 1986:58), primarily from the Anton Chico Land Grant north. The Agua Negra Land Grant was formalized in 1865 by Don Celso Baca, with the ranch settlement of Agua Negra Chiquita later becoming the settlement of Santa Rosa. By the 1880s Hispanic settlements were well established at Pintada on Pintada Arroyo, and at Puerto de Luna on the Pecos River. Farming was concentrated along the Pecos River and major drainages, but the main economic thrust of the Hispanic population was sheep raising. Sheep raising in the area of Santa Rosa was dominated by two major sheep ranches, the Agua Verde and the Juan de Díos, until the collapse of sheep prices in the 1920s ruined most of the sheep raisers (Harlan et al. 1986:58).

Anglo-American Occupation

An American presence became established in the eastern part of New Mexico with the construction of Forts Union, Sumner, and Stanton in the early 1860s (Levine and Mobley 1976:31). However, Anglo-American settlement in the eastern plains of New Mexico did not occur to any great extent until after the American Civil War.

Texas cattle ranchers began moving into the area in the mid-1860s. Some of the first to arrive were Charles Goodnight and Oliver Loving who brought a herd of cattle to Ft. Sumner in 1866. The Loving-Goodnight Trail eventually ran from Cheyenne, Wyoming, south through eastern New Mexico to Belknap, Texas (Harlan et al. 1986:59). A second herd of cattle was brought to Ft. Sumner from Paris, Texas, by John Chisum that same year (1866). Essentially the first Anglo-American settler to the middle Pecos Valley, Chisum eventually controlled a ranch 100 miles wide, stretching for 150 miles along the Pecos River (Broster 1983:13-14).

In time, a number of dispersed ranches were established, despite the hostile relations between the settlers and the resident Plains Indians. The occurrence of regional "vernacular" architectural styles of some of these early ranch structures aids in their dating. One Texas vernacular style, the "dog trot" house, was comprised of two rows of rooms separated by a covered breezeway. Construction of Texas "dog trot" houses in the Southern plains was limited to a period from the 1860s to the early 1880s, when increased economic and political integration of the area with the rest of the United States resulted in this form being replaced by Victorian styles. A classic "dog trot" house, the Jones-Howard Ranch, has been recorded just east of the project area on San Juan De Dios Arroyo.

Anglo-American settlers tended to be cattle ranchers while the Hispanics tended to raise sheep. However, the different settlement patterns of the two groups tended to lesson any propensity for conflict. The Hispanic settlements were primarily located in the Pecos River floodplain, while the Anglo-Americans tended to settle in dispersed ranches away from the river (Harlan et al. 1986:57-58).

Settlement of the area increased rapidly after 1875, with the final defeat of the Comanches and Kiowas and their removal to Oklahoma. This increase in settlement saw increased friction between the Anglo-American and Hispanic populations. A combination of drought and severe winters in 1887 and 1889, with declining cattle prices, ultimately destroyed the great cattle empires of the plains (Harlan et al. 1986:57-58).

The El Paso and Northwestern railroad joined the Rock Island and Pacific railway at Santa Rosa in 1902, linking the plains to both Albuquerque and to cities in the midwest. Homesteading farmers followed the railroad into the area. In Guadalupe County, the county seat was moved from Puerto de Luna to the bustling railroad town of Santa Rosa in 1912. New Mexico law stated that a county seat could only move if a new county was formed. The county was therefore renamed Lenard Wood County (after the Spanish-American War hero) for two years until the new county seat was established. The county name was then changed back to Guadalupe (Anonymous 1942). Santa Rosa, Portales, and Clovis were all eastern New Mexico railroad towns that prospered as shipping points for livestock and produce (Harlan et al. 1986:59).

Many of the farms in the area continued until the "dustbowl" days of the 1930s. Drought, combined with the economic slump of the Great Depression, forced many of the small landowners to sell their land (Harlan et al. 1986:60). Most of the area around Santa Rosa reverted back to cattle ranching in the 1940s, an activity that continues today. Cattle raised around Santa Rosa is now shipped by truck to Clovis where they are loaded onto trains, or are shipped by truck directly to Amarillo.

TESTING RESULTS

A limited testing program was designed for three archaeological sites located along U.S. 84 south of Santa Rosa, and implemented in consultation with the New Mexico State Historic Preservation Division. One site was located on both private land and state land administered by the New Mexico State Highway and Transportation Department. Two sites were on State Trust Land.

The sites of LA 105817, LA 57152, and LA 103315 are lithic artifact scatters varying in size located east of the Pecos River (Levine 1994). All three sites were tested as part of the proposed improvements along a 12.0-km (7.5 miles) stretch of U.S. 84 southeast of Santa Rosa, New Mexico. The purpose of the limited testing program was to determine the extent and importance of the portion of the sites located within the proposed project limits.

Field Methods

A main datum and baseline were established for each site. Surface artifacts were pinflagged to locate artifact clusters and to assist in recording and mapping site limits. A map of each site was produced using a transit, a stadia rod, and a 50-m tape, and the locations of all test units and cultural features were plotted. The location of surface artifacts was plotted with the use of a 50-m tape.

All surface artifacts were piece plotted, analyzed in the field, and left in place. Artifacts were collected only when they were recovered in a test unit, were diagnostic of cultural or temporal affiliation, or were in an area of the site that would be transformed by test unit excavation.

Test units, measuring 1-by-1-m in size, were hand-excavated within the portion of each site located within the project area. These test units were located either within or adjacent to areas of heavy surface artifact concentration, or in other areas of possible prehistoric activity indicated by discolored soil. Existing soil integrity was an added consideration in the placement of test units. All of the excavated dirt was screened through ¼-inch wire mesh and the artifacts collected. Test units were dug in 10-cm levels until either 20 cm of culturally sterile soil, or bedrock, was reached. The number of test units excavated per site varied, depending on surface artifact occurrence, remaining soil integrity, and site size. The number of test units excavated did not exceed eight per site.

Profiles were drawn for each test unit, and both test unit and general site photographs were taken. Test units were backfilled when excavation was completed. Cultural material recovered through these investigations will be curated in the Archaeological Research Collections at the Laboratory of Anthropology, Museum of New Mexico. Field and analysis records will be on file at the Historic Preservation Division, Archeological Records Management Section. The sites are discussed in the order in which they occur within the project area.

LA 105817

LA 105817 is a sparse lithic artifact scatter measuring 274-by-130 m (Figs. 2, 3). The site is on the west side of U.S. 84, at an elevation of 1,408.17 m (4,620 ft). A total of 64 lithic artifacts was recorded at LA 105817. Fifty-five surface artifacts were piece-plotted at the site. An additional nine artifacts were recovered from test units.

The site area slopes downward toward the northwest. Heavy alluvial erosion has removed most of the site topsoil, redepositing most surface artifacts on culturally sterile clay. The southwestern portion of the site area has also experienced some arroyo cutting. A dirt track is present in the northern portion of the site. The presence of livestock has also contributed to site degradation. Two test units were hand excavated at LA 105817.

Test Unit Descriptions

Test Unit 1. Test Unit 1 was dug in the southern portion of the site, in an area of possibly intact topsoil. The test unit was west of U.S. 84 within the existing right-of-way. Surface vegetation was limited to a 40 percent coverage of mixed grasses prior to excavation of the test unit. Four lithic artifacts were collected from the surface of Test Trench 1 prior to excavation.

Excavation ended 20 cm below the modern ground surface in culturally sterile soil. Two strata of material were revealed. Stratum 1 was a thin surface silty duff deposit. Stratum 2 was a fine clay containing caliche. Rodent burrows were present in Stratum 2. Three lithic artifacts were recovered from Stratum 1.

Test Unit 2. Test Unit 2 was dug in an area of possible intact topsoil, in the southern portion of the site. This test unit was within the previously existing right-of-way. Surface vegetation of the test unit prior to excavation was a 30 percent coverage of mixed grasses.

Excavation ended 30 cm below the modern ground surface in culturally sterile soil. Rodent burrows were present throughout the test unit. Two strata of material were found. Stratum 1 was a fine silty surface duff layer. Stratum 2 was a dense brown clay containing small amounts of caliche. Two lithic artifacts were recovered from Stratum 1.

Cultural Features

No intact cultural features or deposits were found within the portion of LA 105817 within the proposed project area.

LA 57152

LA 57152 is a lithic artifact scatter measuring 180-by-390 m (Figs. 4, 5), located on both sides of U.S. 84. Site elevation is 1,402.0 m (4,600 ft). The site slopes downward toward the east. A total of 529 artifacts were piece-plotted on the surface of LA 57152. An additional 264 lithic

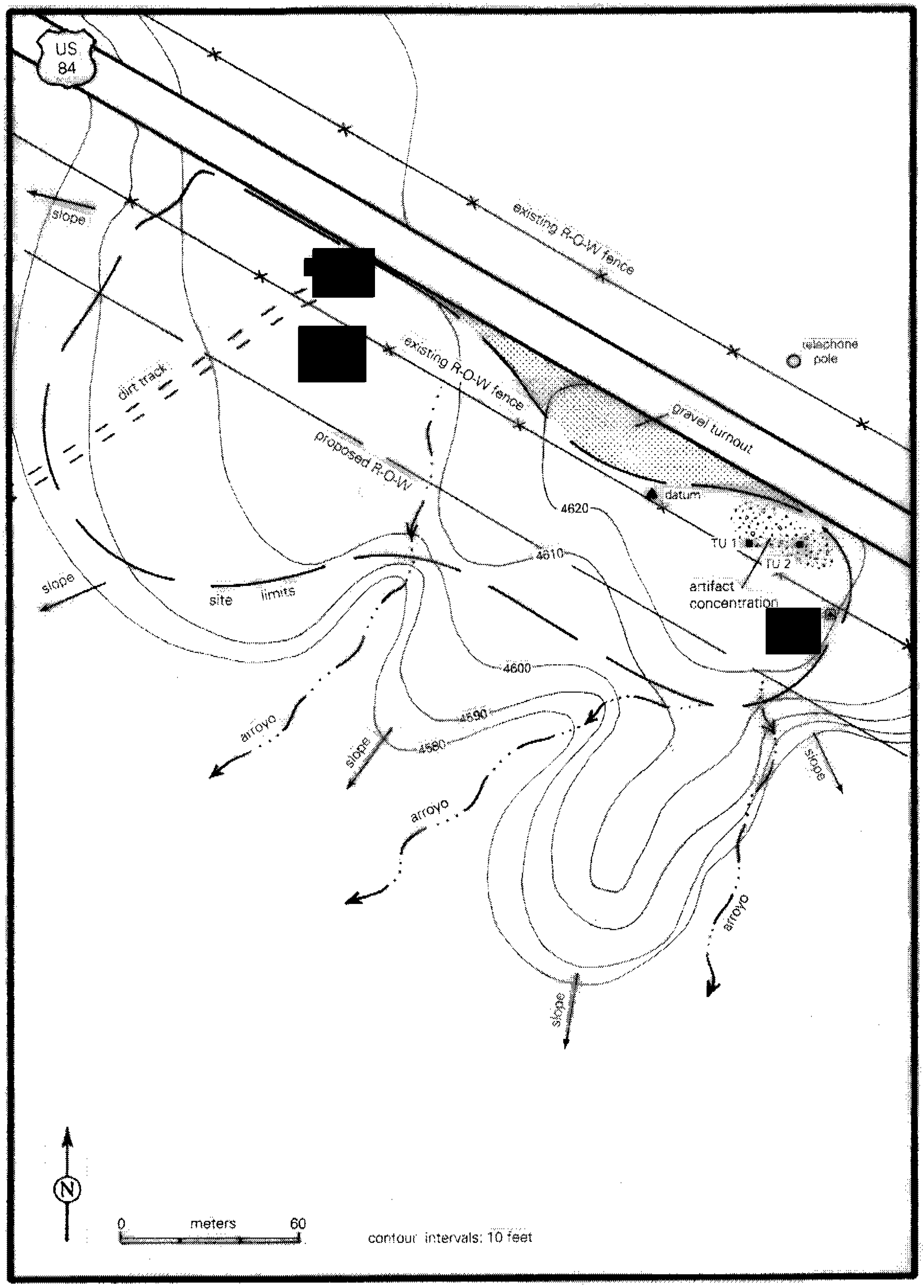

Figure 2. LA 105817 site map.

Figure 3. LA 105817 site overview, looking northwest.

artifacts were recovered from test units. These surface artifacts included a Martindale-style projectile point (6000 B.C.-2500 B.C.), and a burned one-hand mano fragment.

U.S. 84 crosses LA 57152 within a roadcut that averages 2.4 m (8 ft) in depth. The site is deflated and most of the surface artifacts have been redeposited. Two dirt tracks, one on each side of U.S. 84, run the length of the site parallel to the highway. Drainage ditches also parallel U.S. 84. Arroyo cutting is present east of the highway, within the proposed project area. Extensive rodent burrows are present within the site area, and the presence of livestock has also contributed to site degradation. Eight test units were hand-excavated at LA 57152.

Test Unit Descriptions

Test Unit 1. Test Unit 1 was dug within the project area, east of U.S. 84, and adjacent to a surface artifact cluster. Surface vegetation of the test unit area was a 40 percent coverage of mixed grasses. Four lithic artifacts were collected from the surface of Test Trench 1 prior to excavation.

Excavation ended 40 cm below the modern ground surface. Rodent burrows were present throughout the unit. Two strata of material were revealed. Stratum 1 was a brown clayey loam. Stratum 2 was a dense brown clay with flecks of caliche. Thirteen artifacts were collected from Stratum 1. No artifacts were collected from Stratum 2.

Test Unit 2. Test Unit 2 was dug east of U.S. 84, within the existing right-of-way and adjacent to a surface artifact concentration. Test unit surface vegetation was limited to a 70 percent

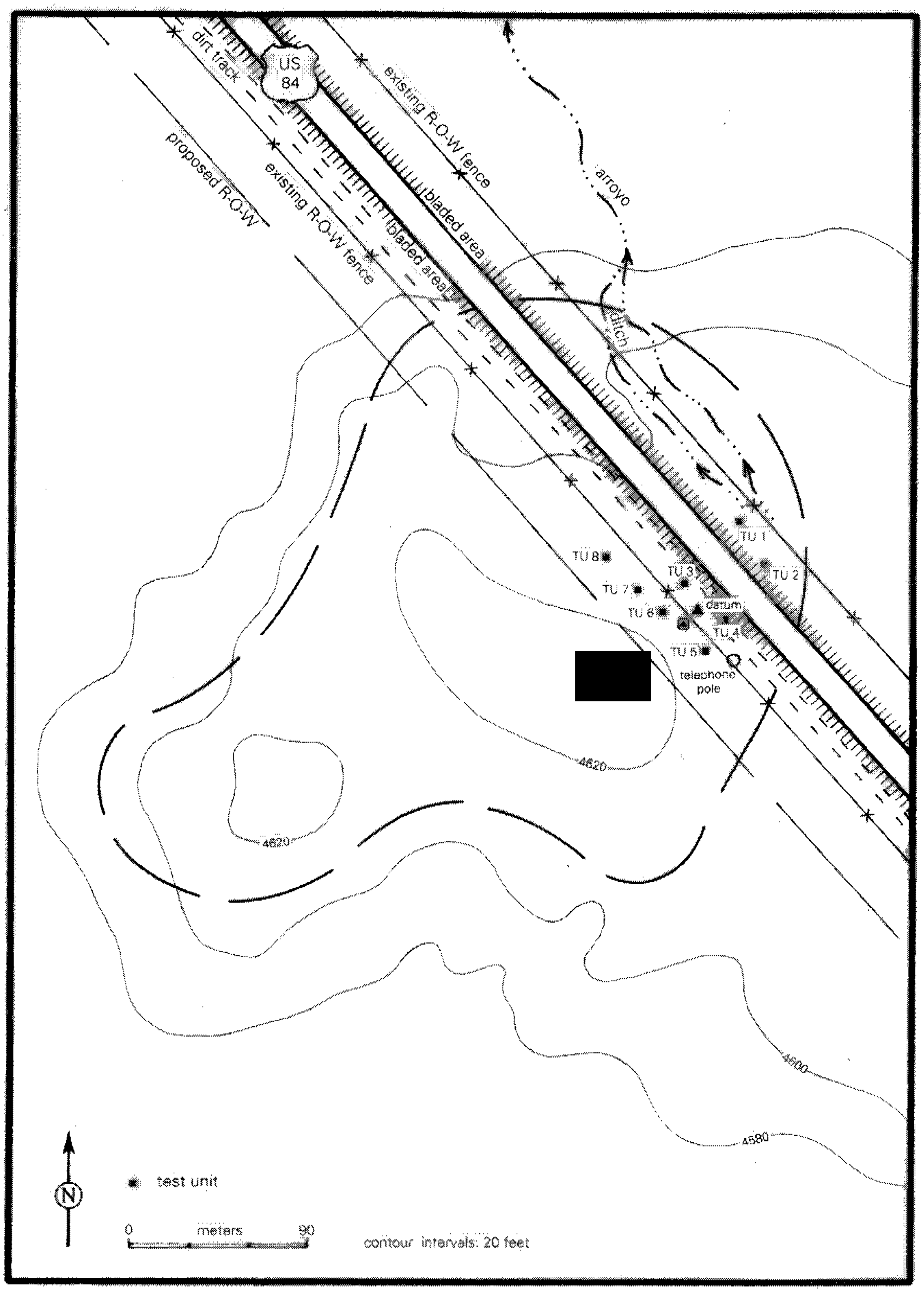

Figure 4. LA 57152 site map.

Figure 5. LA 57152 site overview, looking north.

coverage of mixed grasses prior to excavation. One lithic artifact was collected from the surface of Test Unit 2 prior to excavation.

Excavation ended 40 cm below the modern ground surface. Large numbers of rodent burrows were present in this area of the site. Three strata of material were found within Test Unit 2. Stratum 1 was a fine silty clayey loam. Stratum 2 was a reddish clay. Stratum 3 was a dense yellowish red clay. A total of 79 lithic artifacts, all of them associated with rodent burrows, were collected from Test Unit 2.

Test Unit 3. Test Unit 3 was located west of U.S. 84, but within the existing right-of-way. This test unit was near a surface artifact concentration. Forty percent of this area was covered with mixed grasses prior to excavation. One lithic artifact was collected from the surface of Test Unit 3 prior to excavation.

Excavation of Test Unit 3 ended at 30 cm below the modern ground surface in culturally sterile soil. Rodent burrows were present throughout this test unit. Two strata of material were found in Test Unit 3. Stratum 1 was a soft clayey loam. Stratum 2 was a dense clay containing some caliche. Fifteen lithic artifacts were collected from Test unit 3, but all were found in association with rodent burrows.

Test Unit 4. Test Unit 4 was excavated west of U.S. 84 in the southern portion of the site, within the existing right-of-way. The test unit was dug in a heavy surface artifact concentration. This area had a 70 percent cover of grass and snakeweed prior to excavation.

Excavation ended at 30 cm below the modern ground surface in culturally sterile soil. Rodent burrows were present throughout the test unit. One stratum of material, a fine sandy clay, was found in Test Unit 4. A total of 27 lithic artifacts were found in this test unit, but all were associated with rodent burrows.

Test Unit 5. Test Unit 5 was dug in the southern portion of the site, west of U.S. 84. This was an area of the site with a high number of surface artifacts. Surface vegetation in this area was an 80 percent coverage of mixed grasses prior to excavation. Surface gravel was also present.

Excavation ended at 30 cm below the modern ground surface. Many rodent burrows were present in the area of this test unit. Only one stratum of material was found in Test Unit 5. This was a fine silty, sandy clay. Forty-one lithic artifacts were recovered from this test unit, but all were found in the fill of rodent burrows.

Test Unit 6. Test Unit 6 was dug in the area of a small rise that appeared to be associated with a surface artifact cluster in the western area of the project area. Prior to excavation this area supported a 60 percent cover of mixed grasses and yucca.

Excavation ended at 30 cm below the modern ground surface in culturally sterile soil. Two strata of material were present in Test Unit 6. Stratum 1 was a light sandy clayish loam. Stratum 2 was a dense clay containing some gravel and cobbles. Thirty-five lithic artifacts were collected from Stratum 1. No artifacts were collected from Stratum 2.

Test Unit 7. Test Unit 7 was dug adjacent to a surface artifact concentration in the western portion of the project area. Surface vegetation in this area prior to excavation was a 60 percent coverage of mixed grasses. Surface gravel and a number of large cobbles were also present.

Excavation ended at 20 cm below the modern ground surface in culturally sterile soil. A large number of rodent burrows were present in this test unit. Two strata of material were found in Test Unit 7. Stratum 1 was a thin silty duff layer. Stratum 2 was a sandy silty clay containing gravel. Eight lithic artifacts were recovered from Test Unit 7, all of them from Stratum 1.

Test Unit 8. Test Unit 8 was dug adjacent to a surface artifact concentration in the western portion of the project area. Surface vegetation in this area prior to excavation was a 60 percent coverage of mixed grasses. Three lithic artifacts were collected from the surface of Test Unit 8 prior to excavation.

Excavation of this test unit ended at 30 cm below the modern ground surface in culturally sterile soil. Rodent burrows were present in the unit area. Test Unit 8 revealed three strata of material. Stratum 1 was a fine clayey loam. Stratum 2 was a fine yellowish clay. Stratum 3 was a dense dark brown clay containing some caliche. A total of 36 lithic artifacts was collected from Stratum 1.

Cultural Features

No intact cultural features or deposits were found in the portion of LA 57152 within the proposed project area.

LA 103315

The site of LA 103315 is a lithic artifact scatter measuring 375-by-125 m (Figs. 6, 7), located on the west side of U.S. 84. The site was originally recorded as extending to the east of U.S. 84, but a resurvey turned up no evidence of cultural activity or artifacts in this area. Site elevation is 1,371.6 m (4,500 ft). The site area is a long northwest-facing slope, containing four small rocky knolls. The portion of the site within the existing right-of-way has been mechanically scraped. LA 103315 has also experienced extensive surface erosion, with little intact topsoil remaining and most of the site area reduced to exposed clay. The presence of livestock has also contributed to site degradation. Most surface artifacts have been redeposited. Arroyo cutting has also occurred through the central portion of the site.

A total of 37 artifacts were piece-plotted on the surface of LA 103315. One additional lithic artifact was collected from the test units. Two test units were hand-excavated at LA 103315.

Test Unit Descriptions

Test Unit 1. Test Unit 1 was dug in the southern portion of the site. It was located within the existing right-of-way, in an area of possible intact topsoil. Surface vegetation in this area was limited to a sparse 20 percent coverage of mixed grass and snakeweed prior to excavation.

Excavation ended at 20 cm below the modern ground surface in culturally sterile soil. One stratum of material was revealed within the test unit. Stratum 1 was a dense clay containing both gravel and caliche. Rodent burrows were also present. No artifacts were found in Stratum 1.

Test Unit 2. Test Unit 2 was placed in an area of possibly intact topsoil. The test unit was within the project area, but outside of the existing right-of-way. Ten percent of this area was covered with little bluestem grass. One lithic artifact was collected from the surface of Test Unit 2 prior to excavation.

Excavation ended at 20 cm below the modern ground surface in culturally sterile soil. One stratum of soil was revealed in the test unit. Stratum 1 was a dense clay containing gravel and some caliche. No artifacts were found in Stratum 1.

Cultural Features

No intact cultural features or deposits were found in the portion of LA 103315 located within the proposed project area.

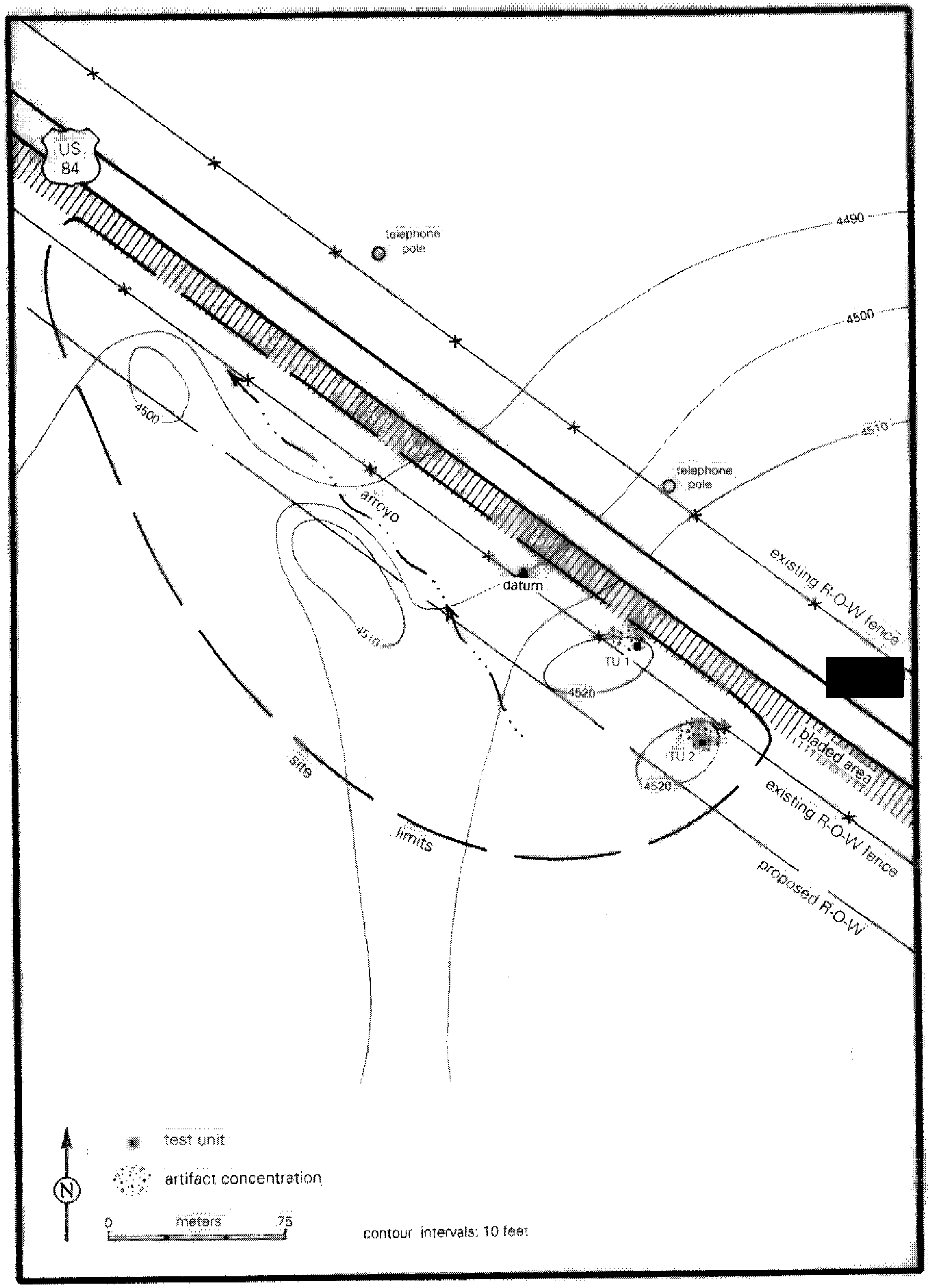

Figure 6. LA 103315 site map.

Figure 7. LA 103315 site overview, looking north.

LITHIC ARTIFACT ANALYSIS

Artifacts analyzed from three sites totaled 895. A majority of the artifacts (n = 621) were from the present ground surface and were analyzed in the field. A total of 274 artifacts were collected and analyzed in Santa Fe.

Analytical Methods

Attributes chosen for the field lithic analysis reflected the desire to achieve the greatest return of useful information within the available time constraints. The guidelines and format of the Office of Archaeological Studies *Standardized Lithic Artifact Analysis: Attributes and Variable Code Lists* (OAS Staff 1995a) were followed. Attribute definitions are included in this publication.

Microwear analysis was deemed impractical and too time consuming for field analysis. Microwear analysis is also limited in its ability to make specific interpretations concerning the worked material (Neusius 1988:211). Relative distinctions in artifact wear can be made based upon the hardness of the contact material (Neusius 1988:211), but failure to deal with the variation caused by differences in material properties (Brose 1975), including hardness, makes most analogy interpretations questionable. In areas of active environmental action, such as these site areas, weathering also confuses microwear studies (Schurrenberger and Bryan 1985:137).

The following attributes were included in analysis.

Material Type

Codes for material types are for general material groups unless the material is unquestionably from a recognized source. For example, although a wide range of chert occurs on these sites, all were classified as "chert." If a specimen was of a specifically named chert (such as Alibates chert), it was coded by the specific name.

Morphology (Artifact Type)

This is the characterization of artifacts by form.

Portion

Portion is the part of the artifact recovered. Flakes and tools can be whole or fragmentary. Angular debris and cores are whole by definition.

Dorsal Cortex

Cortex is estimated to the nearest 10 percent increment. For flakes, this is the cortex on the dorsal surface. Cortex on the platform was not included. For other morphological types, the percentage of cortex on all surfaces is estimated and added together.

Flake Platform

Flake platform is recorded for whole and proximal flakes. Either the morphology of the impact area prior to flake removal or extreme modifications of the impact area caused by the actual flake removal is coded.

Size

Artifact size is recorded in millimeters.

Edge Number

Each utilized edge on an artifact was given an edge number. Consecutive numbers were used for artifacts with more than one utilized edge. Artifacts could conceivably have one or more utilized edges. Each edge was analyzed separately for function and wear patterns.

Function

Function characterizes and describes use on all artifacts.

Wear Patterns

Artifact modification caused by human use is coded as wear.

Analytical Results

Analysis was conducted with two assumptions in mind: (1) that the environmental setting of the sites should suggest the types of activities for which the locale is suited; and (2) that stages of reduction and types of artifact use wear will indicate the range of tasks performed. We can also devise a list of expectations based on the ratio between debitage and tools and the percentages of some specific types of artifacts within each assemblage, regarding when and how the site area was used. The sites were evaluated within this context.

Large flakes tend to be core flakes from early stages of reduction and tend to exhibit unmodified platforms. In the field, a bias toward larger more easily observed flakes probably skewed our data with regard to flake size and morphology. The predominance of core flakes exhibiting cortical or single-faceted platforms in these assemblages may be the result of a sampling bias of this type, rather than from early stage lithic reduction. Few hammerstone flakes (spalls from hammerstones) were found on any of the sites. Angular debris, which occurs at all stages of flint knapping, was also present in low quantities. Low rates of angular debris to flakes are an indication of tool manufacturing. The lithic artifact data are presented by attributes to enable comparisons between the three sites.

Material Selection

The testing of material samples presumed to be useable lithic material and their subsequent discard for a variety of factors, few readily apparent, indicates the accepted suitability of lithic materials for tool manufacture or use. Thus, material use serves as an indication of human-decision making processes with regard to the suitability of materials (Young and Bonnichsen 1985:128).

Three materials dominate the artifact assemblages. These are chert, silicified wood, and a form of metamorphic sandstone commonly known in the area as graywackie or greenwackie (Banks 1990:89). Frequencies of artifacts made of these materials fluctuate from site to site (Tables 1-3), however all of these materials commonly occur in the local Pleistocene gravel and Pecos River terrace deposits. This suggests that local materials were considered adequate for lithic artifact production and use.

Material resembling Alibates chert is present on one site in the project area, LA 57152. Although this material visually resembles Alibates chert from the Canadian River Valley located to the northeast, attributing it to this source is problematic. Small pieces of similar material were visible in the local Pleistocene gravels suggesting a possible Pecos Valley origin. The identification of cherts in this area of New Mexico is proving more complicated than previously thought. Cherts from the Tecovas, Chinle, and Yeso formations occur in this general region of the Pecos Valley (Banks 1990:88). These cherts, in particular Tecovas chert because of its wide range of color and texture, are easily confused with other cherts (Banks 1990:92). Madera cherts, originating in the Sangre de Cristo Mountains, are also present in the Pecos River Valley (Banks 1990:89). The wide range of color, texture, and flaking properties of Madera cherts (Banks 1990:72) includes material visually similar to Alibates chert.

Artifact Morphology and Material

Core flakes make up the largest morphological group within each of the site assemblages. Core flakes also make up the largest morphological category within most material categories. The material classes least represented at all three sites are almost totally comprised of core flakes.

Flake Morphology and Flake Portion

The largest category of flake portion in each of the site assemblages is whole flakes (Tables 4-6). Proximal flake fragment is the second largest category at LA 57152. Lateral flake fragment is the second most common flake portion at both LA 105817 and LA 103315. Less variation in flake portion is present within other flake morphology categories. This appears to be true for both the large site assemblage (LA 57152) and the small assemblages (LA 105817 and LA 103315).

Flake portions may have been affected by the presence of both vehicular traffic and livestock on the sites. Most of the sites have experienced vehicle traffic across the site area within

Table 1. LA 105817, Artifact Morphology by Material Type

	Material Type												Total	
	Metamorphic Sandstone		Chert		Siltstone		Quartzite		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	11	78.5	33	86.8	2	66.7	3	100.0	1	50.0	3	75.0	53	82.8
Biface Thin. flake			2	5.8									2	3.0
Resharp. flake			1	2.6									1	1.5
Biface, early stage			1	2.6									1	1.5
Bidir. core	1	7.1											1	1.5
Multi. core	2	14.2	1	2.6	1	33.3					1	25.0	5	7.8
Chopper									1	50.0			1	1.5
Total	14	100.0	38	100.0	3	100.0	3	100.0	2	100.0	4	100.0	64	100.0

Table 2. LA 57152, Artifact Morphology by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	32	88.8	552	89.9	5	71.4	6	85.7	12	93.3	9	64.2	6	66.6	85	91.3	707	89.1
Biface Thin. flake			15	2.4	1	14.3	1	14.3			2	14.2					19	2.3
Resharp. flake			10	1.6											1	1.0	11	1.3
Uniface			2	0.3													2	0.2
Biface, early stage			7	1.1									2	22.2			9	1.1
Biface, middle stage			12	1.9	1	14.3									5	5.3	18	2.2
Biface, late stage									1	6.7	1	7.1	1	11.1			3	0.4
Unidir. core	3	8.3	1	0.2													4	0.5
Bidir. core			1	0.2							2	14.2			2	2.1	1	0.1
Multi. core	1	2.7	12	1.9													17	2.0
Chopper			2	0.3													2	0.2
Total	36	100.0	614	100.0	7	100.0	7	100.0	13	100.0	14	100.0	9	100.0	93	100.0	793	100.0

Table 3. LA 103315, Artifact Morphology by Material Type

	Material Type								Total	
	Metamorphic Sandstone		Chert		Quartzitic		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%
Core flake	14	87.5	4	100.0			9	52.9	27	71.0
Biface Thin. flake							1	5.8	1	2.6
Biface, early stage							2	11.6	2	5.2
Unidir. core	1	6.2							1	2.6
Multi. core	1	6.2			1	100.0	4	23.5	6	16.7
Chopper							1	5.8	1	2.6
Total	16	100.0	4	100.0	1	100.0	17	100.0	38	100.0

Table 4. LA 105817, Flake Morphology by Portion and Platform Type

	Portion										Total	
	Whole		Proximal		Medial		Distal		Lateral			
	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	38	95.0	2	66.7	1	100.0	1	100.0	7	100.0	49	94.2
Biface Thin. flake	1	2.5	1	33.3							2	3.8
Resharp. flake	1	2.5									1	1.9
Total	40	100.0	3	100.0	1	100.0	1	100.0	7	100.0	52	100.0

	Platform												Total	
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	2	100.0	20	95.2	17	100.0	7	77.8	1	100.0	2	100.0	49	94.2
Biface Thin. flake			1	4.8			1	11.1					2	3.8
Resharp. flake							1	11.1					1	1.9
Total	2	100.0	21	100.0	17	100.0	9	100.0	1	100.0	2	100.0	52	100.0

Table 5. LA 57152, Flake Morphology by Portion and Platform Type

	Portion											Total	
	Whole		Proximal		Medial		Distal		Lateral				
	N	%	N	%	N	%	N	%	N	%		N	%
Core flake	517	95.9	65	91.5	43	100.0	48	98.0	34	100.0		707	95.9
Biface Thin. flake	13	2.4	5	7.0			1	2.0				19	2.6
Resharp. flake	10	1.7	1	1.4								11	1.5
Total	540	100.0	71	100.0	43	100.0	49	100.0	34	100.0		727	100.0

	Platform												Total	
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core flake	91	97.8	109	98.2	411	99.8	43	63.1	25	100.0	28	96.6	707	95.9
Biface Thin. flake	2	2.2	2	1.8	1	0.2	14	21.5					19	2.6
Resharp. flake							10	15.4			1	3.4	11	1.5
Total	93	100.0	111	100.0	412	100.0	67	100.0	25	100.0	29	100.0	737	100.0

Table 6. LA 103315, Flake Morphology by Portion and Platform Type

	Portion								Total	
	Whole		Proximal		Lateral					
	N	%	N	%	N	%			N	%
Core flake	24	96.0	1	100.0	2	100.0			27	96.4
Biface Thin. flake	1	4.0							1	3.6
Total	25	100.0	1	100.0	2	100.0			28	100.0
	Platform								Total	
	Cortical		Single		Multiple		Crushed			
	N	%	N	%	N	%	N	%	N	%
Core flake	6	100.0	17	100.0	3	75.0	1	100.0	27	96.4
Biface Thin. flake					1	25.0			1	3.6
Total	6	100.0	17	100.0	4	100.0	1	100.0	28	100.0

the project area. Cattle and horses can also easily break or modify flakes by stepping on them. All three of the sites within the project area have been heavily grazed for decades.

Dorsal Cortex and Platform Type

The amount of cortex on lithic artifacts and the predominance of core flakes exhibiting cortical or single-facet platforms can provide possible evidence of reduction strategies pursued in a particular location. Cortical and single facet platforms predominate at all three sites (Tables 4-6). Single-facet platforms are the most common form present at LA 57152 and LA 103315, with cortical platforms the second most common. The reverse is true at LA 105817, with cortical platforms the most common form, and single platforms second.

The majority in these two platform types indicates a low level of labor expenditure regarding lithic tool production. These data suggest two possibilities: (1) that only primary and secondary lithic reduction took place on these sites, or (2) that the lithic artifacts present are the result of expedient tool use, not of tool manufacturing.

Dorsal cortex is present on a majority of artifacts from LA 105817 (61.8 percent) and LA 103315 (78.9 percent), but not on a majority of the artifacts from LA 57152 (where it is present on only 41.9 percent of the assemblage). This span of cortex occurrence is indicative of material reduction. The greater the range of cortex present within a material category, the more likely it is that a range of reduction of that material took place (Tables 7-9). In this manner, evidence for the reduction of metamorphic sandstone and chert is present at LA 105817. Evidence for the reduction of metamorphic sandstone, chert, siltstone, quartzite, and silicified wood is present at LA 57152. The reduction of metamorphic sandstone and silicified wood is evident at LA 103315, with limited knapping of other materials. The limited knapping of a material type is more indicative of tool reworking and material testing.

Table 7. LA 105817, Percent of Dorsal Cortex by Material Type

	Material Type												Total	
	Metamorphic Sandstone		Chert		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	6	42.9	18	47.4	1	33.3	2	66.7					27	42.2
10	1	7.1	4	10.5									5	7.8
20	2	14.3	5	13.2									7	10.9
30	1	7.1	2	5.3							1	25.0	4	6.3
40														
50														
60			1	2.6			1	33.3			1	25.0	3	4.7
70	1	7.1			2	66.7							3	4.7
80			3	7.9					1	50.0	2	50.0	6	9.4
90	2	14.3	3	7.9					1	50.0			6	9.4
100	1	7.1	2	5.3									3	4.7
Total	14	100.0	38	100.0	3	100.0	3	100.0	2	100.0	4	100.0	64	100.0

Table 8. LA 57152, Percent of Dorsal Cortex by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood.			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	9	25.0	392	63.8	5	71.4	3	42.9	2	15.4	4	28.6	3	33.3	45	48.4	463	58.4
10	2	5.6	61	9.9			1	14.3					2	22.2	15	16.1	81	10.2
20	3	8.3	27	4.4			1	14.3	2	15.4					7	7.5	40	5.0
30	2	5.6	28	4.6					1	7.7	1	7.1			6	6.5	38	4.8
40	6	16.7	21	3.4					1	7.7	1	7.1			5	5.4	34	4.3
50	1	2.8	15	2.4	1	14.3			1	7.7	2	14.3			1	1.1	21	2.6
60	2	5.6	16	2.6					1	7.7					3	3.2	22	2.8
70	2	5.6	12	2.0							2	14.3			2	2.2	18	2.3
80	4	11.1	16	2.6	1	14.3			3	23.1	2	14.3	2	22.2	2	2.2	30	3.8
90	3	8.3	15	2.4			1	14.3			2	14.3	1	11.1	4	4.3	26	3.3
100	2	5.6	11	1.8			1	14.3	2	15.4			1	11.1	3	3.2	20	2.5
Total	36	100.0	614	100.0	7	100.0	7	100.0	13	100.0	14	100.0	9	100.0	93	100.0	793	100.0

Table 9. LA 103315, Percent of Dorsal Cortex by Material Type

	Metamorphic Sandstone		Chert		Quartzite		Silicified Wood		Total	
Cortex	N	%	N	%	N	%	N	%	N	%
0	4	25.0	1	25.0			3	17.6	8	21.1
10			1	25.0			3	17.6	4	10.5
20	2	12.5					3	17.6	5	13.2
30	2	12.5					1	5.9	3	7.9
40	1	6.3	1	25.0			3	17.6	5	13.2
50										
60							3	17.6	3	7.9
70	1	6.3							1	2.6
80	1	6.3	1	25.0	1	100.0			3	7.9
90	1	6.3					1	5.9	2	5.3
100	4	25.0							4	10.5
Total	16	100.0	4	100.0	1	100.0	17	100.0	38	100.0

Utilization by Material

Analysis of utilization is limited primarily to presence or absence, and a description of the form of utilization or wear. Bidirectional wear is traditionally considered an indication of cutting or slicing, while unidirectional wear was thought to indicate scraping. Experiments conducted by Vaughan (1985) and Moore (James L. Moore, pers. comm. 1992), indicate that wear patterns are unreliable indicators of the type of use.

Notches and denticulates are more specialized tools, and may be indicators of specific activities connected with the manufacture and maintenance of items constructed from perishable materials (Wilkie 1977:14-15). As with other tools however, they may also have been used in a variety of ways for which they were not designed. The range of recorded wear patterns from these sites show that a number of activities, involving more than just tool manufacturing and finishing, took place at these locales.

Material Quality

Single-function artifacts (artifacts with a single utilized, retouched, or retouched and utilized edge) for all three sites are made primarily of fine-grained material (Tables 9-12). At LA 105817, 62 percent of the single-function artifacts were chert and silicified wood. At LA 57152, chert and silicified wood comprise 78 percent of the single-function artifact assemblage. The situation is similar at LA 103315, where fine-grained materials (chert and silicified wood) make up 60 percent of material used. These materials also span the widest range of functional categories within sites. Metamorphic sandstone is the most utilized course-grained material at both LA 57152 and LA 103315.

Table 10. LA 105817, Artifact Function by Material Type

	Material Type										Total	
	Metamorphic Sandstone		Chert		Siltstone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%
Utilized debitage	3	37.5	7	43.8	1	50.0	1	100.0	1	50.0	13	44.8
Retouched debitage	1	12.5	1	6.3							2	6.9
Utilized/ Retouched debitage	2	25.0	4	25.0					1	50.0	7	24.1
Hammer stone	2	25.0	2	12.5	1	50.0					5	17.5
Scraper, side			2	12.5							2	6.9
Total	8	100.0	16	100.0	2	100.0	1	100.0	2	100.0	29	100.0
Second												Total
Function	N	%	N	%					N	%	N	%
Utilized debitage	2	100.0	4	50.0							6	54.5
Utilized\ Retouced debitage			1	12.5					1	100.0	2	18.2
Notch			1	12.5							1	9.1
Scraper, side			2	25.0							2	18.2
Total	2	100.0	8	100.0					1	100.0	11	100.0
Third												Total
Function	N	%	N	%							N	%
Utilized debitage	1	100.0	1	33.3							2	50.0
Sraper, side			2	66.7							2	50.0
Total	1	100.0	3	100.0							4	100.0

Table 11. LA 57152, Artifact Function by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Utilized debitage	7	46.7	49	48.0	2	66.7	1	100.0	1	25.0	4	50.0	1	33.3	9	45.0	74	47.4
Retouched debitage	1	6.7	4	3.9													5	3.2
Utilized/ Retouched debitage	1	6.7	19	18.6							3	37.5			5	25.0	28	17.9
Hammerstone			3	2.9											1	5.0	4	2.6
Chopper			3	2.9									1	33.3			4	2.6
Drill			3	2.9											1	5.0	4	2.6
Graver	1	6.7													1	5.0	2	1.3
Notch			7	6.9					1	25.0					1	5.0	9	5.8
Denticulate			1	1.0													1	0.6
Scraper, Undif.			2	2.0													2	1.3
Scraper, End	2	13.3	2	2.0							1	12.5			1	5.0	6	3.8
Scraper, Side	3	20.0	2	2.0					1	25.0							6	3.8
Knife			7	6.9	1	33.3									1	5.0	9	5.8
Projectile point									1	25.0			1	33.3			2	1.3
Total	15	100.0	102	100.0	3	100.0	1	100.0	4	100.0	8	100.0	3	100.0	20	100.0	156	100.0

Second Function																	Total	
	N	%	N	%					N	%	N	%	N	%	N	%	N	%
Utilized debitage	4	66.7	10	45.5							2	50.0			3	60.0	19	47.5
Utilized/ Retouced debitage			4	18.2							1	25.0					5	12.5
Hammerstone	1	16.7															1	2.5
Chopper			1	4.5									1	100.0			2	5.0
Graver	1	16.7															1	2.5
Notch			2	9.1					1	50.0							3	7.5
Scraper, undif.			1	4.5													1	2.5
Scraper, end																	1	2.5
Scraper, side									1	50.0	1	25.0					2	5.0
Knife			4	18.2													5	12.5
Total	6	100.0	22	100.0					2	100.0	4	100.0	1	100.0	5	100.0	40	100.0

Third Function																	Total	
	N	%	N	%					N	%	N	%					N	%
Utilized debitage	1	100.0	1	33.3													2	33.3
Utilized\ Retouched debitage			1	33.3							1	100.0					2	33.3
Hammer stone			1	33.3													1	16.7
Notch									1	100.0							1	16.7
Total	1	100.0	3	100.0					1	100.0	1	100.0					6	100.0

Fourth Function	Total

	N	%							N	%							N	%
Utilized debitage	1	100.0															1	50.0
Notch									1	100.0							1	50.0
Total	1	100.0							1	100.0							2	100.0

Table 12. LA 103315, Artifact Function by Material Type

	Metamorphic Sandstone		Chert		Quartzite		Silicified Wood		Total	
	N	%	N	%	N	%	N	%	N	%
Utilized debitage	3	60.0	1	100.0			5	62.5	9	60.0
Retouched debitage							1	12.5	1	6.7
Hammerstone					1	100.0			1	6.7
Notch	2	40.0							2	13.3
Scraper, side							1	12.5	1	6.7
Knife							1	12.5	1	6.7
Total	5	100.0	1	100.0	1	100.0	8	100.0	15	100.0
Second Function									Total	
	N	%					N	%	N	%
Utilized debitage							1	100.0	1	50.0
Notch	1	100.0							1	50.0
Total	1	100.0					1	100.0	2	100.0
Third Function									Total	
	N	%							N	%
Notch	1	100.0							1	100.0
Total	1	100.0							1	100.0

Artifacts exhibiting two functions parallel single-function artifacts with regard to material use (Tables 10-12). At LA 105817, the use of coarse-grained material drops. However, although the use of fine-grained materials remains constant at LA 57152, the use of chert remains high but the use of silicified wood drops dramatically. Material use at LA 103315 shifts with second function, with the use of both fine and course-grained material becoming equal.

Artifacts exhibiting three functions (Tables 10-12) occur in small numbers at all sites. Materials represented decrease as the number of artifacts decrease, and the number of functions increase. Materials at both 105817 and LA 57152 remain mainly fine grained by a 2 to 1 margin. At LA 103315 however, only course-grained materials exhibit three functions.

Artifacts exhibiting four functions (Table 11) are present at only at LA 57152. The number of artifacts and materials represented continue to decrease as the number of functions increase.

Single-function artifacts reflect the dominant material types of each site assemblage. Depending on the site involved, this is either chert (medium to fine grained) or silicified wood (fine grained). This pattern of material use is repeated by multiple-function artifacts. Artifact use thus appears to be determined by material availability and not material quality.

Finer-grained lithic materials (chert, silicified wood, fine-grained quartzite and siltstone) are exactly the cryptocrystalline, isotropic, highly silicious lithic materials with elastic qualities that are usually considered the most desirable for reduction (Crabtree 1972:4-5). These materials also produce the sharpest cutting edges, rather than the more durable edges produced by coarser-grained materials (Akins and Bullock 1992:26).

The material quality of both single and multiple function classes indicates selection for convenience (locally available materials) rather than for material quality. Two possibilities are suggested by this selection for convenient materials regardless of the accessibility of a variety of other lithic resources. Both are related to project area site locations near the Pecos Valley.

Use of the project area by groups unfamiliar with the region may account for preference for the immediately locally available lithic material. Kelly and Todd (1988:231-244), have suggested just such a strategy for the early Paleoindian period. A similar exploitation strategy by later Archaic, Anasazi, historic Pueblo, or even Plains groups unfamiliar with the area is possible. However, groups familiar with the area would have known that adequately chippable stone was available. This knowledge of availability could have meant less need for the transporting of nonlocal material.

The reliance on immediately available lithic resources may be related to the possible sudden need for lithic tools, presumably by successful hunting parties. The need for quick, expedient tools could result in the utilization of the immediately available lithic material of adequate quality. This utilization of available materials could be dictated by a hunting strategy designed for exploitation of the local landscape, transcending cultural affiliation.

Tools

Use of the sites as logistical or resource extraction locations should be supported by the presence of bifaces and biface resharpening flakes (Akins and Bullock 1992:27). A biface is a flake or core blank that has been reduced on both faces from two parallel but opposing axes (Kelly 1988:718). Bifaces can be used as either tools or cores without further modification, thus maximizing tool edges and providing durable long use-life tools, while minimizing the amount of lithic material transported. Bifaces have the advantage over other lithic tools of being reliable and easy to maintain.

A difference in biface occurrence should be evident between residential versus logistical sites (Kelly 1988:721-723). Biface production should result in large proportions of biface thinning flakes, low numbers of utilized biface flakes, low numbers of simple cores, and a high frequency of expedient flake tools. Bifacial tools would be produced and maintained in residential sites, but used as tools or cores on logistical sites, resulting in large numbers of utilized biface resharpening flakes. The only site within the project area that could be residential, based on this criteria, is LA 57152.

Limited numbers of bifaces and biface resharpening flakes show evidence of biface production and use, but the noncore flake tool component for most of these sites is too small to allow their evaluation through application of this model. The large numbers of cores and core flakes suggest emphasis on the use of local rather than exotic materials (Kelly 1988:719).

The debitage to tool (including utilized debitage) ratios and percentages varies from site to site (Table 13). A site's debitage:tool ratio could aid in suggesting its relative date when diagnostic artifacts are absent. The lower the debitage:tool ratio, the older the site should be. A more in-depth discussion of this material occurs later in this report.

Table 13. Site Debitage: Tool Ratios

Site Number	Debitage: Tool Ratio	Tool Percentage
LA 105817	2.2:1	45.3
LA 57152	5.0:1	93.0
LA 103315	2.5:1	39.4

The proportion of formal tool forms comprising prehistoric tool kits tend to change through time and space, reflecting the range and duration of activities pursued (Christensen 1987:77). The nature of some assemblages is such that any classification of cultural affiliation beyond a rough determination of late Paleolithic, early Archaic, or Archaic is not possible. Tool location has been determined to aid in the interpretation of site occupation (Schlanger 1991). These sites are too badly deflated and modified for this to be successfully attempted. The occurrence of utilized debitage as expedient tools may indicate that a wider range, or more intense pursuit, of activities took place than those represented by the formal tools. Utilized debitage may also represent the occurrence of an unplanned or unexpected activity (Akins and Bullock 1992:28-29).

GROUND STONE ANALYSIS

A single ground stone artifact was recovered from testing these three sites. This artifact was a partial mano found within the project area at LA 57152. This artifact was collected and analyzed in Santa Fe. No ground stone artifacts were present on the other two sites (LA 105817 and LA 103315). Attributes chosen for analysis reflected the desire to achieve the greatest return of useful information within the available time constraints. The guidelines and format of the Office of Archaeological Studies *Standardized Ground Stone Artifact Analysis: A Manual for the Office of Archaeological Studies* (OAS Staff 1994) were followed.

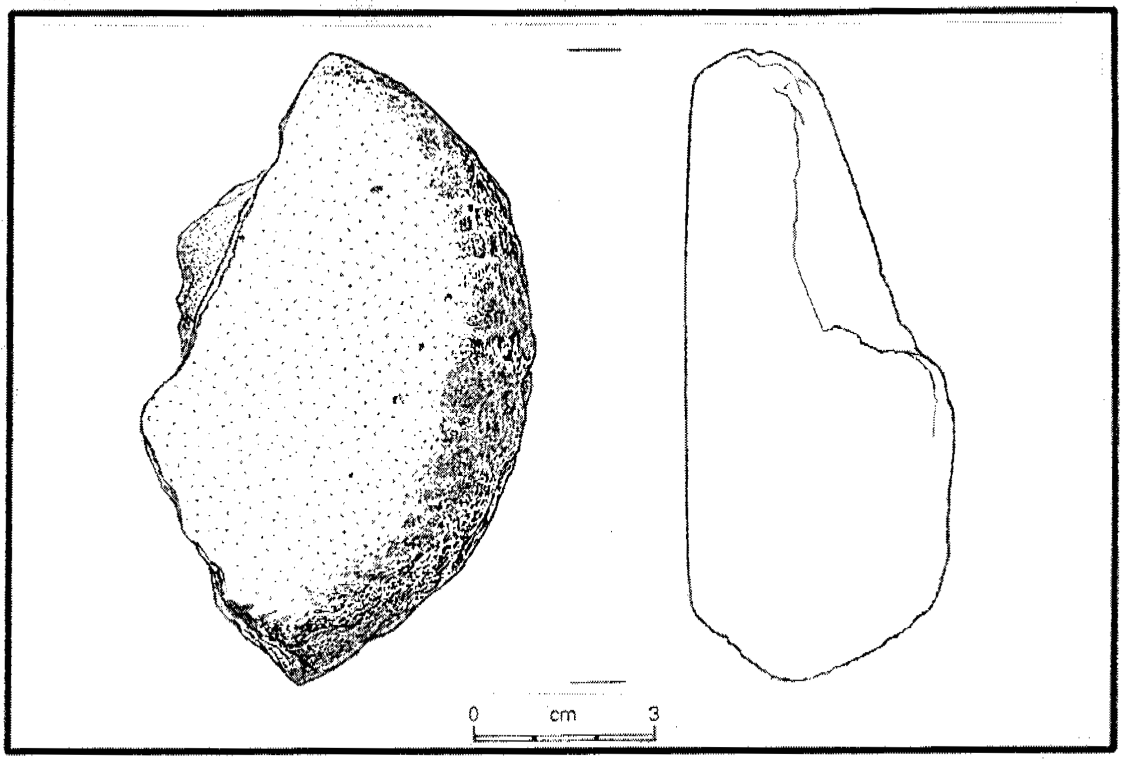

Figure 8. LA 57152 one-hand mano.

Analytical Results

Ground stone artifact analysis was accomplished with two objectives in mind. Identification of the artifact and its form of use would aid in determining site structure or function. In addition, the presence of ground stone artifacts can serve as supporting information in the determination of site period and age. A single one-hand round mano was present. This was a burned fragment representing roughly half of the whole artifact. The most important aspect of this single ground stone artifact was its presence on a site that also contained diagnostic projectile points dating to the early Archaic period.

Small one-hand circular manos occur on a large number of Archaic sites in the eastern portion of New Mexico (Sebastian 1989:48; Lintz et al. 1988:195-198; Ward et al. 1987). The presence of one mano at LA 57152 does not directly support a temporal assignment of the site to the early Archaic period. However, manos of this type do occur on early Archaic period sites (Lintz et al. 1988:160, 164, 211), making its presence consistent with other sites of that time period.

The presence of ground stone artifacts (Fig. 8) suggests that LA 57152 was a site utilized for a number of activities, including both hunting and the processing of plant material. It is possible that the site functioned as a seasonal camp associated with the harvesting of wild plant material or seeds (indicated by the presence of ground stone).

Since the collecting of wild plants has historically been a job assigned to women (White 1962:107; Smith 1974:66; Bailey and Bailey 1986:49; Ellis 1988:187), the presence of ground stone can thus be considered indicative of resource procurement structured around a family-based group limited activity area, rather than a strictly male hunting party group.

DISCUSSION AND CONCLUSIONS

A search of the New Mexico Cultural Resource Information System (NMCRIS) files at the Laboratory of Anthropology shows 50 sites with assigned cultural affiliation, within the 15 USGS quadrangles surrounding the project area. A study of these sites by topography (Table 14) shows Archaic and Anasazi sites occur in the widest variety of topographical locations. Cliff edge, cliff/bluff/scarp, and terrace are the topographic locations that have the widest range of occupations through time. These numbers are based solely on recorded sites.

All of the sites in the project area are on or adjacent to a slope affording long-distance visibility in at least one direction. The location of LA 105817 affords long-distance visibility in a number of directions. We can assume site placement is related to this long-range visibility, although the limited number of sites in this study may not reflect broad, regional patterning.

The Pecos River Valley is an area of both cultural and ecological contact and interaction. The area was utilized by most of the prehistoric cultural groups of eastern New Mexico, but there appears to have been no permanent prehistoric presence of any of these groups in the valley (Ward et al. 1987). At present, this portion of the Pecos Valley is juniper parkland, with riverine habitat present along the Pecos River and its main side canyons and arroyos (Sebastian and Larralde 1989:10, fig. 1.5). Juniper parkland is also present in localized areas of broken terrain within the grasslands east of the Pecos River Valley. These localized areas, as well as the river valley, function as ecological edge areas.

Ecological edge areas are the areas of contact between different biotic communities. They generally occur at changes of elevation, or where physical changes are present in the landscape. Ecological edge areas are "the most convenient location for proximity to the widest variety and stability of resources" (Epp 1984:332). Correlations have been demonstrated between site location and ecological edge areas for sites dating from the Archaic period to the Protohistoric in Saskatchewan, Canada (Epp 1984), and for Archaic sites in the northern San Juan Basin of New Mexico (Reher and Witter 1977:124). A similar positive correlation has been demonstrated by Thurmond (1990:13-20) for Paleoindian sites in the southern plains. Thurmond (1990:17) suggests that site concentrations along many of these biotic borderlands maximizes density as well as diversity of both faunal and floral food resources. The almost continuous utilization of the Pecos River Valley through time would seem to support the concept of the area as one of relative abundance based on increased variety of available resources.

It is likely that the three sites within the project area, although not occupied at the same time, were all connected with the utilization of this faunal and floral resource utilization. The juniper parkland and riverine areas would have provided habitat for deer, a number of smaller mammal species such as jackrabbit and cottontail rabbits, as well as a variety of bird species. Pronghorn and bison have historically been present on the open grasslands both east and west of the Pecos Valley. The overlapping distributions and adjacent habitats of these species suggests that possibly all of them may have been exploited by the inhabitants of these sites.

The lithic artifact assemblage suggests a number of activities for each of these sites. Hunters processing game, maintaining or supplementing their tool kit, or simply passing the time by flint knapping, all would contribute to a varied assemblage. The repeated utilization of specific camp or processing sites is another possibility for the composition of these artifact assemblages.

Table 14. The Cultural Affiliation of Sites by Topography in the 15 USGS Quadrangles Surrounding the Project Area

	Paleo-indian n= %	Archaic n= %	Anasazi n= %	Mogollon n= %	Historic Pueblo n= %	Plains n= %
Arroyo/wash			1/ 5.2			
Blow out		1/ 5.8	1/ 5.2			
Canyon Rim	1/ 100	5/ 29.4	4/ 21.0			2/ 28.5
Cliff/ scarp/bluff		2/ 11.7	2/ 10.5	2/ 40.0		2/ 28.5
Hill top			1/ 5.2			
Hill slope		2/ 11.7		1/ 20.0		1/ 14.2
Low rise						1/ 14.2
Mesa/butte		1/ 5.8	1/ 5.2			1/ 14.2
Open canyon			1/ 5.2			
Ridge			1/ 5.2	1/ 20.0		
Terrace		3/ 17.6	5/ 26.3			
Other (unknown)		3/ 17.6	2/ 10.5	1/ 20.0	1/ 100	
Totals	1/ 100	17/ 99.6	19/ 99.5	5/ 100	1/ 100	7/ 99.6

Knowing how the site areas may have been used may provide clues to both who used the sites, and when they were used. A model (Table 15) combining hunter-gatherer subsistence (Binford 1980), early and late Archaic subsistence (Irwin-Williams 1984), and observations of prehistoric and historic Pueblo subsistence practices has been developed (Schelberg and Akins 1987; Akins and Bullock 1992:32). This model is based on the premise that there is enough variation in how these different groups would have utilized the same resource to enable some evaluation of lithic artifact assemblages, even if diagnostic artifacts are not present.

Early Archaic groups were essentially foragers (Binford 1980:5-9; Irwin-Williams 1984:9). These groups moved their residential bases frequently and gathered food daily during short forays from these bases. Longer forays, or resource procurement trips, were made by specialized work parties, such as parties of hunters, to subcamps. These subcamps, or "extractive locations" were used for short periods of time, a fact exhibited by low rates of tool abandonment. Early Archaic tools should reflect high-cost acquisition and curation, and a wide niche exploitation based on smaller animals and unspecialized gathering. Greater mobility and dependence on hunting could be reflected in the use of nonlocal lithic resources and greater technological skill (Schelberg and Akins 1987:20; Akins and Bullock 1992:33). The longer the foray, the greater the amount and complexity of the equipment utilized (Kelly 1988:720). Lithic assemblages from early Archaic sites thus should lack cores, and the amount of cortex in the assemblage should be low, indicating that primary reduction was performed at the place of material procurement. This, combined with a

Table 15. Expected Early and Late Archaic and Anasazi Lithic Assemblages

	Late Paleoindian-Early Archaic	Late Archaic	Anasazi
Subsistence Pattern	forager	collector	collector
Degree of Mobility	high	intermediate	low
Lithic Materials	nonlocal	some nonlocal	few nonlocal
Technology	biface	biface	expedient
Archaeological Results			
Debitage/Tool ratio	low	low	high
Flake percentage	high	high	very high
Core percentage	high	present	low
Bifaces	present	present	few present

relatively high level of nonlocal materials, is consistent with the high degree of mobility suggested for the early Archaic (Akins and Bullock 1992:33).

Later Archaic groups are classified as collectors, groups who live on stored food for at least part of the year, and who gather food in logistically organized food procurement groups (Akins and Bullock 1992:33; Binford 1980:10). Middle and late Archaic groups, operating with broader economic bases and higher population densities should produce lithic artifact assemblages indicative of reduced exploitative areas, the scheduling of resource utilization, and storage (Akins and Bullock 1992:33; Irwin-Williams 1984:9-10). Resources would be exploited by task-oriented groups focused on a specific resource that could be gathered in quantity. Middle and late Archaic assemblages should therefore be dominated by nonlocal materials, and specialized tools should be present at task-oriented sites (Akins and Bullock 1992:34).

Anasazi and historic Pueblo subsistence is better understood, with postulated Anasazi subsistence based on historic Pueblo organization. Small mammals and birds were hunted both individually and opportunistically, but were also hunted in large-scale communal hunts. Larger mammals, deer, pronghorn, and bison, were hunted individually when it was possible, but were usually hunted by hunting parties. White (1974:301-302) describes these hunts as usually lasting for approximately six days at Zia. Vegetal foodstuffs were gathered in a similar manner. These were gathered individually, except when seasonally occurring plants or fruit became available in large quantities. In these cases organized communal gathering took place (White 1974:302).

Modern Pueblo activities, including hunts, were scheduled in advance around agricultural duties. Because these hunting parties had definite focus and goals, we would expect a high degree of preparation to have taken place. However, because of the lower degree of dependence on hunting than in nonagricultural societies, we would expect a lower level of technological expenditure (Akins and Bullock 1992:35). Lithic assemblages from Anasazi sites reflect an expedient lithic technology, with flakes primarily produced for use as short-term disposable tools.

Formal tools, other than projectile points, tend to be rare.

A similar pattern seems to exist for historic Plains Indian sites. Flakes are commonly present but formal tools, other than projectile points tend to be rare.

Lithic artifact attributes have been used by a number of researchers to distinguish Archaic from Anasazi artifact assemblages. Archaic assemblages tend to have more formal tools and associated small production flakes. Anasazi expedient tool production or core reduction tends to produce larger core flakes. Material preference in tool use also distinguishes the two groups. A set of expectations derived from subsistence patterns, degrees of mobility, and level of technology is presented in Table 15. This suggests that material use should help distinguish early from late Archaic sites, and that technology will help distinguish Archaic from Anasazi sites (Akins and Bullock 1992:36).

The three sites within the project area are compared with a number of sites located within the same general area of eastern New Mexico and the upper Pecos Valley (Tables 16-18). A range of time periods and site types are represented. Attributes between these sites are compared in Tables 16-18. Although differences in analysts can make some comparisons difficult, general trends can still be observed.

The sites chosen for comparison tend to be single component sites with good cultural designations based on the presence of diagnostic artifacts. LA 55693 is located approximately 3 km (2 miles) east of the project area. LA 57453 is located west of Portales, approximately 128 km (80 miles) to the southeast of the project area. LA 18674, LA 18580, LA 18472, and LA 18476, are sites located in the Los Esteros Project approximately 32 km (20 miles) to the north of the project area in the Pecos River Valley.

Main consideration is directed toward four attributes within the lithic assemblages that are believed to reflect cultural change in a time sensitive manner. These "marker" attributes are (1) the ratio between debitage and tools (including utilized debitage), (2) the percentage of flakes within the assemblage, (3) the percentage of cores within the total assemblage, and (4) the percentage of bifaces present. Two general trends should be present in a comparison of this type. One is an increase in both the debitage:tool ratio and in the percentage of flakes within the total assemblage, through time. The second trend is a corresponding decrease in the percentage of the assemblage composed of bifaces and cores. Through a comparison of these four attributes, cultural affiliation can be postulated for sites where diagnostic artifacts are not present. This is accomplished by plotting each site's position within a progression between well-dated sites (sites with diagnostic material) (Bullock 1994).

In a "perfect world" all four of our marker attributes will confirm the position of a specific site, relative to firmly dated sites within a general region. It is more likely that one or more of these four attributes will not conform as expected. Site variation, whether real or caused through sampling bias, can easily affect one or more of these percentages. However, the general trend should be sufficient to place the site within a cultural affiliation, relative to other sites, even if no finer resolution is possible (Bullock 1994).

Of the three sites within the project area, one site (LA 57152) contains diagnostic artifacts that allow it to be assigned to a specific cultural period. The lithic artifact assemblage at LA 57152 contains a Martindale-style projectile point. Two additional Martindale-style projectile points were

Table 16. Comparison of Selected Lithic Assemblage Attributes from Project Sites with Sites in the General Upper Pecos Valley

Site number	LA 55693	LA 57453	LA 57152*
Time period	Late Paleoindian-Early Archaic	Late Paleoindian-Early Archaic	Early Archaic
Site type	Lithic scatter	Lithic scatter	Lithic scatter
Number of lithics	161	80	793
Material %		debitage only	
chalcedony	7.4	11.0	
chert	53.4	24.0	77.4
siltstone	3.1		1.6
quartzite	1.2	58.0	1.7
quartzitic ss.	29.2		1.1
metamorphic ss.			4.5
other	5.6	7.0	13.4
Cortex % 0	23.6		58.4
1-30	16.9		20.0
31-60	21.7		6.9
61-90	12.3		46.4
91-100	25.5		2.5
Debitage:Tool ratio	1.9:1	1.9:1	5.0:1
%Flakes	58.3	56.0	93.0
%Cores	24.8	8.4	2.7
%Bifaces	4.3	8.4	4.3
%Ground stone		16.8	0.1

Source: LA 55693, Harlan et al. 1986; LA 57453, Lintz et al. 1988.
Sites marked with an asterisk (*) are within the U.S. 84 Sunshine Valley project.

Table 17. Comparison of Selected Lithic Assemblage Attributes from Project Sites with Sites in the General Upper Pecos Valley

Site number	LA 103315*	LA 18674	LA 105817*
Time period	Archaic	Archaic	Archaic
Site type	Lithic scatter	Rockshelter	Lithic scatter
Number of lithics	38	346	64
Material%			
chalcedony			
chert	10.5		59.3
siltstone			4.6
quartzite	2.6		4.6
quartzitic ss.			3.1
metamorphic ss.			
sil. wood.	42.1		21.8
other	44.7		6.2
Cortex % 0	21.1		42.2
1-30	31.6		25.0
31-60	21.1		4.7
61-90	15.8		23.5
91-100	10.5		4.7
Debitage/tool ratio	2.5:1	6.2:1	2.2:1
%Flakes	73.6	86.3	81.2
%Cores	18.4	6.3	9.3
%Bifaces	5.2	3.1	3.1
%Groundstone		2.6	

Source: LA 18674, Ward et al. 1987.
Sites marked with an asterisk(*) are within the U.S. 84 Sunshine Valley project.

Table 18. Comparison of Selected Lithic Assemblage Attributes of Project Sites with Sites in the General Upper Pecos Valley

Site number	LA 18580	LA 18472	LA 18476
Time period	Anasazi	Historic Pueblo	Proto/Historic Plains
Site type	Lithic scatter	Lithic scatter	Tipi settlement
Number of lithics	183	1852	3365
Material % chalcedony chert siltstone quartzite quartzitic ss. metamorphic ss. other			
Cortex % 0 1-30 31-60 61-90 91-100			
Debitage/Tool ratio	25.1:1	33.2:1	21.5:1
%Flakes	96.1	97.0	98.5
%Cores	0.5	0.1	less than .0
%Bifaces	1.6	1.0	less than .0
%Groundstone	1.0	0.4	less than .0

Source: LA 18476, Mobley et al. 1978; LA 18472 and LA 18580, Ward et al. 1987. Sites marked with an asterisk (*) are within the U.S. 84 Sunshine Valley project.

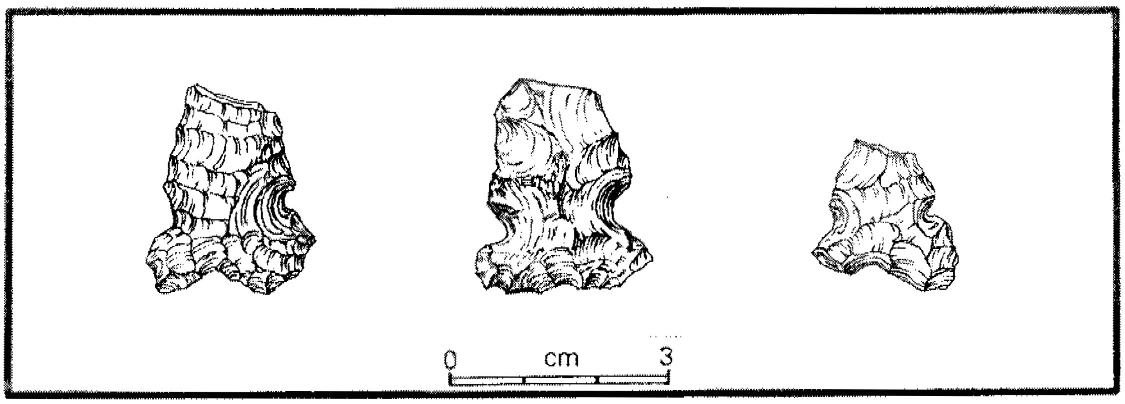

Figure 9. LA 57152 Martindale-style projectile points.

recorded on the site, but outside of the project area (Fig. 9). These projectile points date from 6000 to 2500 B.C., the early Archaic period. However, the debitage:tool ratio for this site is higher than expected for this time period.

A study of our four marker attributes is inconclusive for the sites of LA 105817 and LA 103315. Although there is some indication that LA 103315 could be an early Archaic site, the evidence is too weak to have much meaning. It is possible that conflicting site data are the result of more than one site component being present. It may also be a by-product of site modification. LA 105817 and LA 103315 have therefore been assigned to a general Archaic cultural period, finer dating resolution not being possible with the data available.

Except for LA 57152, it has been impossible to assign more than a general Arcahic designation to the sites within this project. However, the whole point of this exercise has been to do more than simply assigning a generic Archaic label if possible to lithic artifact scatters lacking diagnostic artifacts. Lithic artifact scatters contain more information than is usually believed, but it has to be looked for. Patterns are present within this data that should be time-sensitive and reflective of cultural change. The degree of resolution possible may be limited and the results may be tenuous, but lithic artifact scatters will only provide more information if approached with the expectation that the information exists.

ASSESSMENTS AND RECOMMENDATIONS

Three prehistoric archaeological sites were tested within the proposed project area of planned improvements to U.S. 84 southeast of Santa Rosa, Guadalupe County, New Mexico. One site, LA 57152, can be definitely assigned to the early Archaic period (6000 B.C.- 2500 B.C.), based on the presence of diagnostic projectile points. The other two sites, LA 105817 and LA 103315, have been assigned a general archaic date due to their lack of diagnostic artifacts.

The heavily eroded nature of the sites, and site modification caused by livestock and rodents, makes the determination of site type as habitation, limited activity area, or seasonal resource procurement area impossible to determine.

It is our opinion that no further investigations are needed at any of the three sites (LA 105817, LA 57152, and LA 103315) located within the proposed project area.

Information derived from the surface mapping, the test excavations, and the analysis of their artifact assemblages, provides insight into the functions of these three sites and aids in the interpretation of those portions of the sites existing within the proposed project area.

LA 105817

LA 105817 is an Archaic site. The small artifact assemblage, the lack of diagnostic artifacts, and the eroded nature of the site made finer dating resolution impossible. The artifact assemblage suggests that this was a camp site. The site is heavily eroded and most of the artifacts have been redeposited, making it impossible to determine the nature of any activities that may have taken place at this location. No intact features or deposits were found.

Limited archaeological testing within the proposed project limits at LA 105817 did not reveal any features or deposits likely to yield important information on the prehistory of LA 105817 or of the region. It is our opinion that no further investigations are needed.

LA 57152

LA 57152 is an early Archaic site. The site has been assigned to the early Archaic period based on the presence of three Martindale-style projectile points (6000 B.C.-2500 B.C.). The presence of one ground stone artifact (a one-hand mano fragment) suggests that LA 57152 is a seasonal residential site where at least the limited processing of plant material may have taken place. The deflated nature of the site makes it impossible to determine the range of specific activities that may have occurred at this location. No intact features or deposits were found. All artifacts were found within 10 cm of the modern ground surface, or within rodent burrows.

Archaeological testing within the proposed project limits at LA 57152 did not reveal any features or deposits likely to yield important information on the prehistory of LA 57152 or of the region. It is our opinion that no further investigations are needed.

LA 103315

LA 103315 is an Archaic period site. The small size of the artifact assemblage, coupled with the lack of diagnostic artifacts, makes any finer dating resolution impossible. The site is heavily eroded and most of the artifacts have been redeposited. No intact features or deposits were found. All of the artifacts were found on the present ground surface.

Archaeological testing within the proposed project limits at LA 103315 did not reveal any features or deposits likely to yield important information on the prehistory of LA 103315 or of the region. It is our opinion that no further investigations are needed.

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