

# MUSEUM OF NEW MEXICO

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## OFFICE OF ARCHAEOLOGICAL STUDIES

### ARCHAEOLOGICAL TESTING AND TREATMENT PLAN FOR A LATE ARCHAIC PERIOD SITE AND THREE COALITION-EARLY CLASSIC PERIOD SITES, ESTATES V AND OTHER AREAS, LAS CAMPANAS DE SANTA FE, SANTA FE COUNTY, NEW MEXICO

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## ARCHAEOLOGY NOTES 140

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## ADMINISTRATIVE SUMMARY

This report contains the results of archaeological testing of three sites, LA 84787, LA 84793, and LA 86156 in Estates V, and a data recovery plan for these sites and LA 98690, located in the southwest corner of the Las Campanas de Santa Fe property. Las Campanas de Santa Fe is a 4,400-acre resort development west of Santa Fe, New Mexico. The archaeological work was completed by the Museum of New Mexico, Office of Archaeological Studies, in compliance with Santa Fe County Ordinance 1988-8.

LA 84787 is a multicomponent lithic artifact scatter dating to the late Archaic period. Archaeological testing of artifact concentrations revealed greater or equal subsurface artifact abundance than was represented on the surface in four concentrations (Areas 1, 2, 3, and 4). Areas 5 and 6 did not yield evidence of high artifact density or diversity. It is recommended that LA 84787 be considered significant based on criteria in Santa Fe County Ordinance 1988-8.

LA 84793 is a Coalition period to early Classic period sherd and lithic artifact scatter with three artifact concentrations and a thermal feature. Two artifact concentrations, Areas 2 and 3, had limited data potential, yielding few subsurface artifacts and no associated features. Area 1 had a Santa Fe Black-on-white pottery concentration associated with a thermal feature that was partially excavated. The evidence for intense heat within the feature, combined with a sherd breakage pattern that is similar to pottery found at LA 86159 and at kiln sites in the Mesa Verde region, suggest that Area 1 was used for pottery firing. In accordance with the criteria outlined in Santa Fe County Ordinance 1988-8, LA 84793 has the potential to yield significant information on Coalition and early Classic period population use of the Las Campanas and Santa Fe areas.

LA 86159 is a Coalition to early Classic period sherd and lithic artifact scatter with two sherd concentrations associated with thermal features, a lithic artifact concentration, and an isolated thermal feature. Areas 1 and 5 have thermal features associated with Santa Fe Black-on-white pottery exhibiting breakage patterns similar to discarded pottery associated with kilns in the Mesa Verde region. Area 5 had a relatively high density lithic artifact concentration near Feature 2, a cobble-lined hearth. According to criteria outlined in Santa Fe County Ordinance 1988-8, LA 86159 has the potential to yield significant information about the Coalition to early Classic period use of the Las Campanas and Santa Fe areas.

LA 98690 is late Coalition-early Classic period site that was reoccupied numerous times for hunting and gathering. It was recorded during the final phase of archaeological survey at Las Campanas de Santa Fe. No testing was conducted at the site, but its size and spatial patterning suggest discrete activity areas, indicating that it has the potential to produce significant information. LA 98690 was recommended for data recovery according to criteria outlined in Santa Fe County Ordinance 1988-8.

A treatment plan is provided that outlines research questions, data needs, and field and laboratory methods. The treatment plan was prepared in accordance with guidelines in Santa Fe County Ordinance 1988-8.

MNM Project 41.547C; Santa Fe County Ordinance 1988-8

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## INTRODUCTION

The Office of Archaeological Studies (OAS), Museum of New Mexico, conducted archaeological testing at the request of Las Campanas de Santa Fe in compliance with Santa Fe County Ordinance 1988-8 during September and October 1993. Eleven archaeological sites were evaluated in accordance with the July 1, 1993, proposal submitted to Las Campanas de Santa Fe by OAS. Santa Fe County accepted the proposal as recommended by Mr. James O'Hara, New Mexico Historic Preservation Division (HPD). This report provides archaeological testing results, recommendations, and a treatment plan for three of the eleven sites, LA 84787, LA 84793, and LA 86159. These sites were originally identified by Southwest Archaeological Consultants, Inc. (SAC) in 1991 (Scheick and Viklund 1991 [SW Report 278]) and 1992 (Scheick and Viklund 1992 [SW Report 305]).

A fourth site, LA 98690, will be included in this study. LA 98690 was originally recorded during the final phase of the Las Campanas de Santa Fe archaeological survey by OAS (Post 1992). After the survey, OAS advised Las Campanas to place LA 98690 in a protective easement, if possible. There were no definite plans for development of the southwest corner of the property at the time. Subsequently, Las Campanas de Santa Fe has decided that the site area may be impacted by proposed construction. A treatment plan for LA 98690 is included in this report in the eventuality that Las Campanas decides to develop the area.

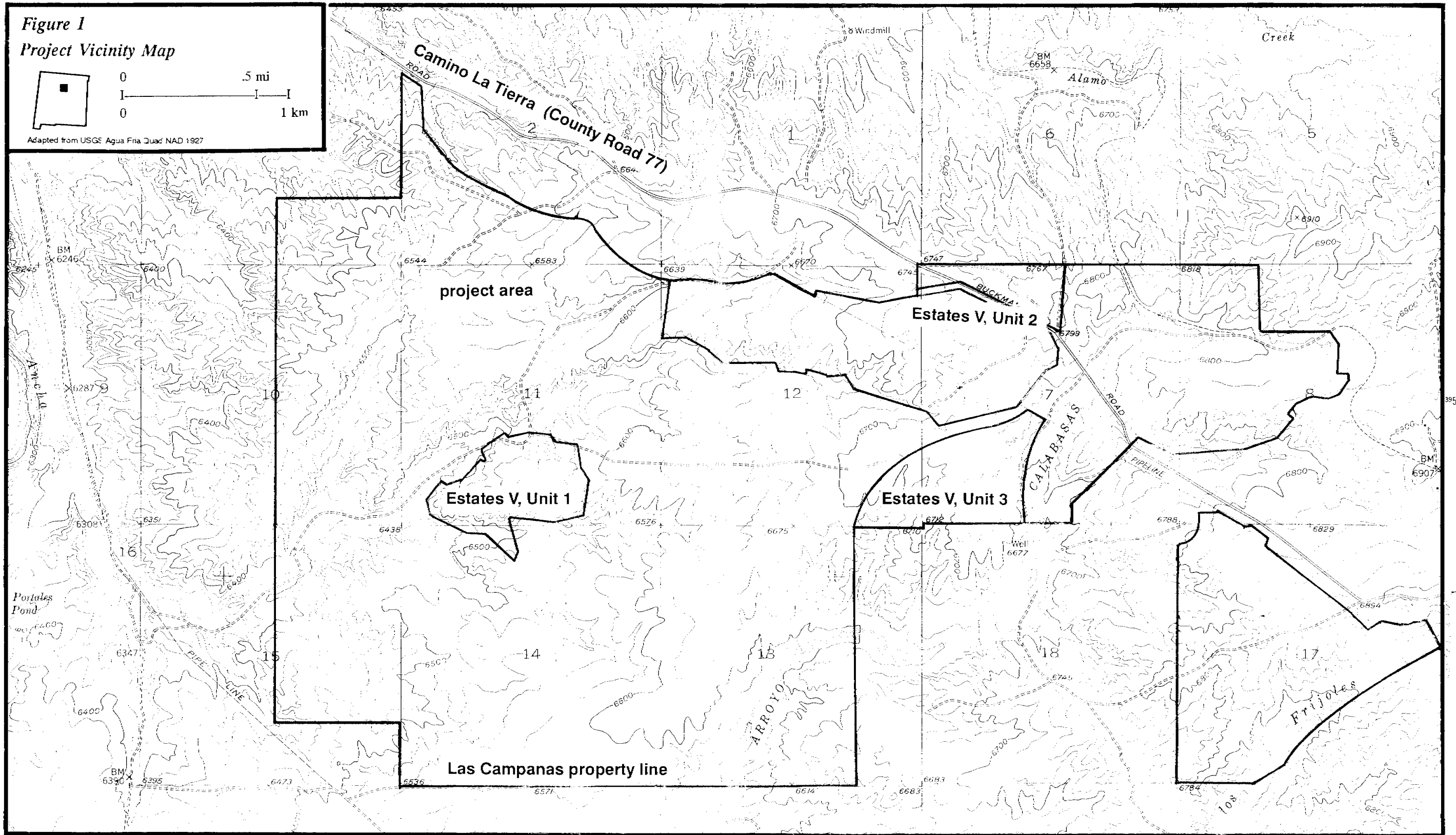
LA 84787, LA 84793, and LA 86159 were located within Estates V, Units 2 and 3. LA 98690 was located in the southwest corner of the Las Campanas de Santa Fe property. Site locations are in Appendix 1 (removed from copies in general distribution). The project vicinity is shown in Figure 1. Site legal descriptions and UTM locations are on file at the Archeological Records Management Section, State Historic Preservation Division, Santa Fe, New Mexico.

The purpose of the archaeological testing was to determine the nature, extent, and significance of the three sites. The archaeological testing program was designed to allow an assessment of site data potential and significance with minimum impact to the site. Testing was conducted in a manner that would allow the excavations to be easily incorporated into a more extensive excavation when a site was determined to be significant.

Figure 1  
Project Vicinity Map



Adapted from USGS Agua Fria Quad NAD 1927



## CONTEMPORARY ENVIRONMENT

The contemporary environment of the Santa Fe Basin has been thoroughly reviewed in a study by Kelley (1980) as part of the Arroyo Hondo Archaeological Project. The reader is referred to this monograph for the wealth of detail it contains. Maxwell (1988) and Scheick and Viklund (1992) concisely summarize the contemporary environment for the northwest Santa Fe and Las Campanas area.

The project area is within a structural subdivision of the Southern Rocky Mountain physiographic zone (Folks 1975:110). The basin is bounded on the west by the Jemez Mountains and to the east by the Sangre de Cristo Mountains. An alluvial plain, dissected by many arroyos, stretches westward from the foothills at the base of the Sangre de Cristos. Elevation in the project area ranges from 1,910 m to 2,252 m.

Local topography alternates among nearly level plains, rolling terraces, and steep, rocky slopes. The major drainage is the Santa Fe River, however the Arroyo Calabazas drains much of the eastern half of the Las Campanas area. The western half of the Las Campanas area drains into a series of medium-sized tributaries of Cañada Ancha. Smaller tributary arroyos have cut deeply into the alluvial plain forming steeply sided valleys. The Rio Grande is 10 km to the east of the project area.

Alluvial materials of ancient and modern gravel are found in all the arroyos and in slope wash and terrace deposits. Tertiary volcanic deposits, Cenozoic sediments, and Precambrian rock are exposed in surrounding areas and, combined with local alluvium, provide most of the materials needed for prehistoric lithic artifact production. In particular, chert is available in the Ancha formation (Kelley 1980:11-12), whereas sandstone, siltstone, andesite, basalt, and silicified wood occur in nearby formations (Hannaford 1986:4). Local chert and quartzite are the primary lithic raw materials found on Las Campanas sites. Small amounts of obsidian are found scattered along the basalt-capped mesas to the west (Kelley 1980:12). The primary obsidian source for the study area was probably the Jemez Mountains.

The flora and fauna of the area are typical of Upper Sonoran grasslands. The piñon-juniper community thins as it descends from the Sangre de Cristo foothills. The piñon-woodland grades into shortgrass plains with scattered juniper about midway between the foothills and the Santa Fe River (Kelley 1980:61-62). The open, grass-covered valleys contain grama grass, muhly, Indian ricegrass, galleta grass, soapweed yucca, one-seed juniper, Colorado piñon, occasional Gambel's oak, and small stands of mountain mahogany. The arroyo bottoms contain various shrubs such as fourwing saltbush, Apache plume, rabbitbrush, big sagebrush, and wolfberry. Regional fauna include desert cottontail, black-tailed jackrabbit, and Gunnison's prairie dog. A complete list of flora and fauna found in the area is in Kelley (1980).

The area has a semiarid climate. Most of the local precipitation occurs as intense summer thunderstorms that produce severe runoff and reduce usable moisture. The area receives an average of 229 to 254 mm of precipitation per year and a mean snowfall of 356 mm (Kelley 1980:112). The growing season ranges from 130 to 220 days and averages 170 days. The last spring frost usually occurs in the first week of May and the first fall frost occurs around the

middle of October. The mean yearly temperature is 10.5 degrees C.

The four sites are located near the headwaters of major tributaries or along the margin of Arroyo Calabasas. These sites are located at the boundary between grassy table land and highly dissected gravel ridges and terraces. These areas have a sandy, loamy, gravelly top soil that is highly erodible. The site soils range from stabilized (by grama grass) to barren, sandy soils that are recently eroded and cut by erosion channels. The vegetation is typical of piñon-juniper woodland or scrubland.



## ARCHAEOLOGICAL BACKGROUND

### Regional and Local Prehistory

This section will provide archaeological background for the four sites discussed in this report. Collectively, the site occupations may span from 1800 B.C. to A.D. 600 and from A.D. 1175 to 1425. This period includes the Basketmaker II, Coalition, and early Classic periods of the Rio Grande sequence as outlined by Wendorf and Reed (1955). The summaries are derived from regional syntheses of the upper Middle Rio Grande Valley culture history (Cordell 1979; Stuart and Gauthier 1981; Biella and Chapman 1979; Lang and Scheick 1989; McNutt 1969; Stubbs and Stallings 1953) and recent survey and excavation reports from the Las Campanas area (Viklund 1990; Scheick and Viklund 1991, 1992; Scheick 1991a, 1991b, 1992; Lang and Scheick 1991; Post 1992). For cultural-historical data not presented in this section the reader is referred to the above regional syntheses. Site frequency by period for the Las Campanas project is presented in Table 1.

#### *Late Archaic-Basketmaker II Period (800 B.C. to A.D. 600)*

**Introduction.** In the northern Southwest the Archaic period (5500 B.C. to A.D. 400 or 600) is generally described in terms of two major material culture traditions: the Oshara tradition (Irwin-Williams 1973) and Cochise tradition (Sayles 1983). The material remains, types, and distributions of sites reflect mobile hunting and gathering adaptation that are based upon seasonal availability of critical resources. Available resources include edible plants, game animals, and water. Phase or stage definitions within these traditions are based on temporal changes in material culture, site structure, and settlement patterns. Sites from the Oshara and Cochise phases are most commonly recognized by temporally diagnostic projectile point styles.

Sites with projectile points that are similar to Oshara and Cochise materials have been identified in the upper Middle Rio Grande. Early and middle Archaic period materials are similar to the Jay, Bajada, and San Jose phases of the Oshara tradition. The late Archaic-Basketmaker II period materials are similar to the Armijo and En Medio phases of the Oshara tradition and the Chiricahua and San Pedro stages of the Cochise tradition. The early and middle Archaic phases and the Armijo phase of the late Archaic period are not represented in the Las Campanas site assemblage and will not be discussed. For more information on these periods, the reader is referred to the regional syntheses cited earlier. This discussion will focus upon the Late Archaic-Basketmaker II sites (800 B.C. to A.D. 400 or 600) that have been identified in the Las Campanas and surrounding Santa Fe and southeast Pajarito Plateau areas.

Changes in settlement and subsistence patterns are evident during the 800 B.C. to A.D. 400-600 period. These changes were initiated during the Armijo phase (1800 to 800 B.C.) and had far-reaching consequences. Evidence of the important changes in settlement patterns and subsistence strategies are recognized in material culture and subsistence data, site structure and site distributions. An important change was the transition from a highly mobile hunting and gathering adaptation to a more sedentary lifestyle. This transition is represented by the use of pit structures, storage pits, the adoption of cultivated plants, and an increase in population. How and

**Table 1. All Sites by Project and Period**

Area	Archaic Period	Developmental Period		Coalition Period		Classic Period		Historic				Unknown	Total Sites
		Early-Middle	Late	Early	Late	Early	Late	Proto-historic Period	Spanish Colonial Period	Territorial Period	Statehood to present		
E. Golf											1	3	4
W. Golf	4			9		4	1	1		1	7	26	53
Estate I					3			1	1	1	1	23	30
Estate II		3		4	1	6				2	2	92	110
Estate III	1		1	4				2				28	36
OAS Survey		1		5		2			1			8	17
Total	5	4	1	22	4	12	1	4	2	4	11	180	255

when these changes occurred in the upper Middle Rio Grande Valley is poorly understood given the small number of excavated sites with reliable absolute dates. Presently, most explanations and interpretations rely heavily on the data from the Middle Rio Puerco Valley (Irwin-Williams 1973; Biella 1992).

**The Data Base.** Late Archaic and Basketmaker II period sites are the most abundant, pre-pueblo sites in the Santa Fe area. Recent projects have identified late Archaic-Basketmaker II components southeast (Viklund 1989; Lang 1992), southwest (Hannaford 1986; Lent 1988), and east (Lang 1989) of Santa Fe. Thirty-one sites or components have been found in the area comprised by the eight USGS 7.5' quadrangle maps that include and surround the Las Campanas area (Table 2). The open-air sites, consisting of lithic artifact scatters, with or without hearth complexes or fire-cracked rock concentrations, are mostly dated with diagnostic projectile point styles. Site clusters in the Airport Road area, southwest of Santa Fe, along the Cañada de los Alamos to the south of Santa Fe, and along the Santa Fe River, suggest that certain low-land locations were repeatedly occupied for short periods by small groups over a long period of time. Basketmaker II sites are reported in all environmental zones from the Santa Fe River Valley to the foothills of the Sangre de Cristo Mountains. Year-round occupation on a limited basis may have been possible because the Santa Fe River Basin and the surrounding montane and piedmont environments offer considerable resource diversity. A vertical mobility pattern that made use of resources at different elevations was suggested by Chapman (1980) based on the Cochiti Dam and Reservoir data. This regionally less extensive settlement pattern is in direct contrast to large-area mobility patterns suggested for the San Juan Basin late Archaic-Basketmaker II populations (Elyea and Hogan 1983; Vierra 1990; Fuller 1989).

Generally, the artifact counts for all sites of this period tend to be low. Only 13 sites have been recorded containing more than 100 surface artifacts. The artifact assemblages reflect plant processing, hunting and meat processing, raw material procurement and core reduction, and tool production and maintenance. Few sites have been found that focus on a specific activity. Only 11 sites have been recorded containing ground stone, suggesting that plant processing sites may be less widespread. Most of the assemblages reflect generalized hunting and gathering activities. Evidence of pit structures have been found at two sites, LA 84758 in the Las Campanas area and LA 54752, near Airport Road in Santa Fe. Extensive storage facilities have not been reported. Habitations imply longer occupations that may have lasted from late fall to early spring. Future excavation of late Archaic-Basketmaker II sites should focus on locating the ephemeral structural remains.

Most of the sites from the Santa Fe area could be classified as limited or temporary base camps and limited activity sites. These site types have few or no processing facilities and equipment, low density artifact scatter, or small artifact clusters and very few unbroken tools. Brief occupations are suggested by the artifact assemblages and distributions. Facilities and equipment are associated with longer occupations (Binford 1983a; Vierra 1980; Elyea and Hogan 1983). Unbroken tools should have been discarded at residential sites instead of limited activity sites because the tools were considered personal gear and may have been highly curated (Binford 1983b; Kelly 1988). Reuse of a limited base camp or activity area may result in overlapping or refurbishment of features and a higher artifact density (Camilli 1989). Reoccupation may result in a more scattered feature and artifact distribution.

Table 2. Late Archaic-Basketmaker II Period Sites in the Santa Fe Area

LA	Quad	Date range	No. of components	Setting	Size	Site type	Artifact count	Groundstone MA MT GF	Other tools B S H O	How dated?
81382	Agua Fria	1500-500 B.C.	1	Hill slope	15 x 8	Dispersed artifact scatter	17		2	D
84772	Agua Fria	100 B.C.-A.D. 500	1	Ridge top-hill slope	120 x 85	Dispersed artifact scatter	10's		1	D
84775	Agua Fria	1500 B.C.-A. D. 300	1	Hill slope	63 x 25	Dispersed artifact scatter	18		1	D
84787	Agua Fria	100 B.C.-A.D. 400	1	Ridge top-hill slope	40 x 40	Concentrated lithic scatter	10's		1	D
86148	Agua Fria	1000 B.C.-A.D. 400	1	Ridge top-hill slope	55 x 80	Concentrated lithic scatter	10's	1	4	D
75683	Seton Village	1000 B.C.-A.D. 400	1	Hill slope	18 x 25	Lithic scatter	15		1	D
75686	Seton Village	A.D. 400 - 1540	1	Hill slope	270 x 165	Dense sherd & lithic scatter	100's			D
75687	Seton Village	1000 B.C.-A.D. 400	1	Hill slope	42 x 45	Concentrated lithic scatter	10's		1	D
88335	Seton Village	Late Archaic	1	Bench-arroyo edge	50 x 20	Lithic scatter-processing center	low 100's		1 1	D

Table 2. Late Archaic-Basketmaker II Period Sites in the Santa Fe Area (cont.)

LA	Quad	Date range	No. of components	Setting	Size	Site type	Artifact count	Groundstone MA MT GF	Other tools B S H O	How dated?
54755	Turquoise Trail	800 B.C.- A.D. 400	1	Arroyo- wash	100 x 75	Lithic scatter- special purpose site	10's		1	D
54761	Turquoise Trail	800 B.C.- A.D. 400	1	Arroyo- terrace	120 x 55	Lithic scatter- special activity site	100's		1	D
65206	Santa Fe	800 B.C.- A.D. 600	1	Hill slope		Lithic procurement- processing site	1000's		1 11 101	D
76546	Santa Fe	1000-100 B.C.	1	Ridge top	136 x 32	Special activity- processing center	100's	1	* * *	D
84744	Santa Fe	Basketmaker 'style' point	1	Ridge top	37 x 29	Special activity- processing center		2	1	D
21547	Montoso Peak	BM II	1	Hill slope	100 x 100	Lithic artifact scatter	500 +		*	D
75136	Montoso Peak	BM II	1	Low rise		Lithic artifact scatter			1	D
79652	Montoso Peak	1800-800 B.C. 100 B.C.-A.D. 400	2	Hill slope	60 x 50	Lithic procurement	100's	1 1 1	1 2	D D

Table 2. Late Archaic-Basketmaker II Period Sites in the Santa Fe Area (cont.)

LA	Quad	Date range	No. of components	Setting	Size	Site type	Artifact count	Groundstone MA MT GF	Other tools B S H O	How dated?
79657	Montoso Peak	1 B.C.- A.D. 550 or A.D. 500-1230	1	Hill slope	24 x 29	Lithic/sherd scatter w/possible work station	10's	1	1 1 1	D
44835	Agua Fria	Archaic-BM II	1	Flat plain	30 x 25 dispersed area/ 50 x 20 core area	Lithic scatter	low 100's	1	2 1	D
44836	Agua Fria	Archaic-BM II	1	Flat plain	45 x 30 dispersed area/ 120 x 120 core area	Lithic scatter/ seasonal camp (?)	low 100's	1 1	3	D
54752	Agua Fria	Archaic/ En Medio/ Trujillo	1	Arroyo/ wash	95 x 66	Lithic scatter/ hunting camp (?)	100's	1	6	D
80723	Agua Fria	500 B.C.-A.D. 400	1	Arroyo/ wash- flood plain	640 x 396	Artifact scatter	10's		1	D
29791	White Rock	BM II	1	Arroyo/ wash	25N 32E 35S 55W	Lithic scatter		1	1	D

Table 2. Late Archaic-Basketmaker II Period Sites in the Santa Fe Area (cont.)

LA	Quad	Date range	No. of components	Setting	Size	Site type	Artifact count	Groundstone MA MT GF	Other tools B S H O	How dated?
29797	White Rock	BM II	1		15N 35E 25S 0W	Sherd & lithic scatter			1	D
64629	White Rock	BM II	1	Plain	25 x 15	Lithic scatter			1	D
65022	White Rock	BM II	1	Mesa	45 x 30	Sherd & lithic scatter/ probable short-term camp	40-50	1	1	D
82572	White Rock	Archaic	1	Mesa	100 x 30	Dispersed lithic scatter	40-50		1	D
82613	White Rock	Late Archaic	1		245 x 150	Concentrated lithic scatter	100's		1	D
75680	Seton Village	1458 B.C. 400-700 B.C.	2	Ridge	100 x 27/42	Lithic scatter			1 1	O D
75681	Seton Village	A.D. 310-508 A.D. 379-573 1800-800 B.C.	3	Knoll		Lithic scatter			1 1 1	O O D
75687	Seton Village	1000 B.C.- A.D. 400	Five 1	Hill slope	28 x 14	Repetitive use/special activity site	350		1 2 6	D
			2		30 x 26		14		1	D
			3		114 x 41		203		9 5 4	D
			4		36 x 20		37		2	D
		1500 B.C.- A.D. 300	5		27 x 17		62	1 1	2 4	D

A small number of late Archaic-Basketmaker II period sites may be residential base camps. These sites may have domestic features for habitation, storage, production, and consumption. The artifacts occur in high density clusters and tend to be more diverse, reflecting the greater number of site activities. If reused or reoccupied, these sites can be very difficult to interpret unless the deposits are spatially distinct. Recorded sites that may be residential sites include LA 88335 (Seton Village 7.5' Quad), LA 21547 and LA 79657 (Montoso Peak 7.5' Quad), and LA 44835 and LA 88436 (Agua Fria 7.5' Quad). These sites have lithic artifact concentrations with diagnostic projectile points, ground stone, and a small assemblage of formal tools. Without excavation this interpretation remains uncertain. If they are residential sites, late Archaic-Basketmaker II use of the Santa Fe River Valley and surrounding environs may have been more intensive than previously believed.

Three sites have been excavated in the Santa Fe area that have yielded numerous processing facilities, probable structures, and a diverse artifact assemblage. These sites combine with the survey data to indicate that the Santa Fe area was well used during the late Archaic-Basketmaker II period.

The excavation of LA 61282, a late Archaic period site located along Airport Road in Santa Fe, yielded 14 pit features and the remains of a possible shallow pit structure. The artifact distribution has pockets of high artifact density. Suggested activities include food and resource processing, production, and food consumption. These factors indicate that the site may have been a residential or limited base camp. The accumulation and superimposition of features indicate that this base camp may have been reused, resulting in the higher artifact density.

Another site in the same area, within the Tierra Contenta development, has yielded deeply buried structural remains and high artifact diversity and density. These factors indicate that the site was a residential base camp. The diagnostic artifacts date to the late Archaic period (Schmader n.d.).

All sites with fire-cracked rock concentrations in the Cochiti Reservoir area have been classified as residences. Chapman (1979:68) recognized this classification system as simplistic. The Cochiti Reservoir sites lacked diverse tool assemblages and low frequencies of formal tools, which would bring into question their classification as residential sites. Direct evidence of food processing and consumption was rare from Cochiti sites. Inferences were drawn from the presence of hearths, fire-cracked rock, and grinding implements.

**Las Campanas Sites.** The late Archaic period sites include spatially extensive scatters of chipped stone debris. Core reduction and tool manufacture debris are present. Recent excavations at LA 87458 by OAS yielded a pit structure and ten hearths or roasting pits resulting from a Basketmaker II occupation or an earlier but unconfirmed late Archaic occupation. The artifact assemblage included core reduction and tool production debris, numerous one-hand manos, shallow basin metates, three projectile points, utilized flakes, and biface fragments.

LA 86148, a possible limited base camp or special activity site, was excavated as part of the Estates IV data recovery effort. The artifact assemblage of ground stone, utilized flakes, and projectile points suggests a variety of activities. The lithic reduction exhibits aspects of a logistically organized strategy (Kelly 1988; Binford 1983a).



Surrounding late Archaic-Basketmaker II period sites have lower artifact diversity and frequency. These may be repeatedly used resource extraction loci. One of the smaller sites has a lithic assemblage dominated by core reduction flakes. This suggests that the late Archaic period residents were actively using the local lithic materials. The small number of late Archaic-Basketmaker II period sites with limited accumulations of debris suggests part-time use of the area with longer occupations represented by LA 87458.

### *Pueblo Period*

**Coalition Period (A.D. 1200-1325).** The Coalition period is marked by three major changes in the archaeological record in the Northern Rio Grande: (1) a significant increase in the size and numbers of sites, suggesting an increase in population and an extension of the early village level organization noted in the late Developmental period; (2) pithouses as domiciles were replaced by contiguous arrangements of adobe and masonry surface rooms; and (3) a change in pottery-making technology from mineral paint to organic-based painted pottery. These changes were sufficiently important to warrant a new period in the Northern Rio Grande cultural sequence that was divided into two phases: Pindi (A.D. 1220-1300) and Galisteo (A.D. 1300-1325) (Wendorf and Reed 1955). The decorated pottery was divided into Santa Fe Black-on-white and all its local variants (Stubbs and Stallings 1953) for the Pindi phase and Galisteo Black-on-white (Mera 1935) for the later phase. Most of the large sites were established during the Pindi phase. The largest sites continued to grow into the Galisteo phase, anticipating the large villages of the Classic period. Site sizes ranged from 2 to 200 rooms; 15 to 30 rooms was the most frequent size (Stuart and Gauthier 1981:51). Site frequencies in all areas of the Northern Rio Grande increased enormously at this time (Biella and Chapman 1977:203; Orcutt 1991; McNutt 1969; Lang 1977).

In the Santa Fe River Valley large villages on the prehistoric floodplain near the river channel were established during the early Coalition period. The only reported excavations are at Pindi Pueblo (LA 1) (Stubbs and Stallings 1953) and the Agua Fria Schoolhouse site (LA 2) (Lang and Scheick 1989). LA 1, LA 2, LA 109, LA 117, LA 118, and LA 119 have Santa Fe and Galisteo Black-on-white pottery and a small amount of glaze-paint pottery suggesting that all six sites are roughly contemporaneous. These villages formed a large continuous community that was 3.2 km (2 mi) long. LA 1 (Pindi Pueblo) and LA 2 (Agua Fria Schoolhouse) were primary villages within the community. Carter and Reiter (1933) originally recorded them as historic period sites. Sites in the Santa Fe River Valley recorded by Carter and Reiter (1933), but not by Mera, include CR (Carter-Reiter) 178, 180, 182, 183 and 185. These were reported as Historic period sites but they may have had Coalition and early Classic period components.

Site data for the late Coalition period show a thriving community along the Santa Fe River. Farming along the Santa Fe River, the presence of fresh water springs, and the access to diverse environments for subsistence items and raw material all contributed to successful settlement. So successful was settlement that while the communities of the Four Corners area of the American Southwest were declining, the Santa Fe River community was growing.

**The Las Campanas Sites.** By numbers of sites and isolated artifacts, the Coalition period is best represented in the Las Campanas area. The tabulation in Table 1 includes sites that have ceramic assemblages of Santa Fe, Galisteo, or Wiyo Black-on-white pottery in the Coalition period. Twenty-one sites date between A.D. 1200 and 1325. Furthermore, about 40 percent of the

isolated sherds from all periods date to the Coalition period. This fact would imply that the project area was most intensively used during the Coalition period. The greatest number of Coalition period sites are in the Estates III/West Golf Course area. These are early or middle Coalition period sites, as defined by the presence of Santa Fe Black-on-white, Galisteo Black-on-white, and Wiyo Black-on-white. Generally, the Coalition period sites range from 300 to 2,800 sq m in area with two sites extending over more than 10,000 sq m. The lithic artifacts are mostly core reduction flakes. Ground stone and bifaces are occasionally present. Some of these sites, especially from Estates III/West Golf Course, are multicomponent and have later occupations. The low frequency of bifacial tools and ground stone at these sites suggest that they were resource extraction loci with processing or consumption occurring at the residence. Hunting may have been staged from these sites but there is very little evidence of tool production or maintenance on these sites. Basically, the Coalition period sites look very similar to the earlier Developmental period sites except that they are more numerous.

**Classic Period (A.D. 1325-1600).** Wendorf and Reed (1955) mark the beginning of this period by the appearance of Glaze A and locally manufactured red-slipped pottery (see also Mera 1935; Warren 1979a). Characterized by Wendorf and Reed as a "time of general cultural florescence," regional populations reached their maximum size and large communities with multiple plaza and room block complexes were established. Although the reasons for the appearance and proliferation of the glaze wares are debatable, many researchers, including Eggan (1950), Hewett (1953), Mera (1935, 1940), Reed (1949), Stubbs and Stallings (1953), and Wendorf and Reed (1955), believe that the similarity of the new pottery to White Mountain Redware is evidence for large-scale immigration into the area from the San Juan Basin and Zuni region. Steen (1977) argues, however, that the changes seen during this period resulted from rapid indigenous population growth. Steen believes that the population growth was enabled by favorable climatic conditions that allowed Rio Grande populations to practice dry farming in previously unusable areas. Steen also suggests that there was "free and open" trade between the Northern Rio Grande region and other areas, accounting for the observed changes in Classic period material culture.

It is therefore unclear how much of the population increase during this period resulted from immigration or from intrinsic growth. Besides populations migrating from the west, it has also been suggested that some population growth was due to the arrival of people from the Jornada branch of the Mogollon to the south, and perhaps from northern Mexico (Schaafsma and Schaafsma 1974).

Large villages of this period found in the Santa Fe vicinity include the Agua Fria Schoolhouse site (LA 2), Arroyo Hondo (LA 12), Cieneguilla (LA 16), LA 118, and LA 119. When Glaze B pottery appeared (ca. A.D. 1425), however, only Cieneguilla was still occupied by a large population. Dickson (1979) believes that abandonment of the large villages was due to the drought conditions revealed by tree-ring studies (Fritts 1965; Rose et al. 1981) and subsequent agricultural failure.

LA 1 and LA 2 are the best known Classic period sites and are located in the Santa Fe River Valley south of the project area. LA 1 was occupied during the early Classic period, A.D. 1325 to 1350 (Stubbs and Stallings 1953:155). This may have been a time of population movement and village reorganization. Pindi Pueblo experienced a short interlude of decreased occupation before A.D. 1325, but by A.D. 1330 new building and renewed use of older parts of the pueblo occurred (Stubbs and Stallings 1953:14). A similar pattern was suggested for LA

12 (Arroyo Hondo Pueblo, Lang and Scheick 1989:196). A change in kiva function or a shift in social organization may be indicated by a change in kiva frequency (from four to two) within villages and a change in their location from subterranean to surface placement. Perhaps, as kiva function became more specialized the number decreased. Plazas were more conspicuous at this time suggesting a more centralized social organization that may have required larger community areas for social or ceremonial functions. It is known that the large villages of the Galisteo Basin, the Rio Grande, and the Rio Chama showed the same trends in the construction of fewer kivas and use of larger, more centrally located community space, as did the early Classic period Pindi Pueblo. The full florescence of the Classic period was not realized at Pindi Pueblo because it was abandoned in A.D. 1350, just as the larger villages were being established.

The limited excavation data for LA 2 suggests an occupation that lasted until A.D. 1420 that corresponds with the abandonment of Arroyo Hondo Pueblo and the growth of La Cieneguilla. Little is known about the early Classic period at LA 2. The abundance of Glaze A pottery suggests that the residents were engaged in regular social or economic interaction with the more southern Classic period villages (Lang and Scheick 1989). Lang and Scheick (1989:195) surmise that LA 2 was the largest village in the Santa Fe River Valley until A.D. 1420. If the village did house between 1,000 and 2,000 people as suggested by Lang and Scheick (1989:196), then the smaller surrounding villages (LA 117, LA 118, and LA 119) may have been abandoned by A.D. 1350 with the local population coalescing at LA 2. An untested hypothesis suggests that this coalescence may have been brought on by a change in social organization and not environmental conditions. The resources of the Santa Fe River could have been successfully exploited by many little villages. Success notwithstanding, sometime after A.D. 1350, everybody may have moved into one large village. If economic resources were equally available to all, then there must have been other social or religious factors that contributed heavily to population aggregation (Cordell 1979:58).

After A.D. 1420, the Santa Fe River Valley, east of Agua Fria, was mostly abandoned. The large settlement at La Cieneguilla increased in size and was still occupied by Native Americans until the Pueblo Revolt in A.D. 1680. The settlement pattern that prevailed throughout the Rio Grande, Rio Chama, and Galisteo Basin was a decrease in small villages or large farmsteads. The remaining large villages dramatically increased in size (Stuart and Gauthier 1981). Presumably these large villages had extensive subsistence catchment basins and extensive networks of social and economic interaction. The pattern of few or no Native American sites dating between A.D. 1420 and 1680 is graphically reflected in the survey results from large parcels near the Santa Fe River Valley (Hannaford 1986; Maxwell 1988; Wiseman 1978; Gossett and Gossett 1989; Lang 1980).

**The Las Campanas Sites.** The Classic period date, which is recognized by single or combinations of pottery types that include the Rio Grande Glaze Ware series and Abiquiu and Bandelier Black-on-gray, was assigned to 13 sites. The Classic period sites are concentrated in the Estates III/West Golf Course and Estates II. The Classic period sites range between 500 and 11,000 sq m in size. They are primarily small concentrations of sherds and lithic artifacts with a dispersed overlay of core flakes from local lithic material. Most of these sites exhibit evidence of core reduction and occasional utilized flakes or biface fragments. These sites essentially show little change from the preceding period except that the artifact scatters tend to be smaller and the pottery types are different.

The largest Classic period site, LA 98688, reflects occupation by a larger group and repeated occupations over a long period of time. The bulk of the occupation occurred between A.D. 1315 and 1425 when Cieneguilla Glaze-on-yellow and Agua Fria Glaze-on-red were common. The predominance of these two pottery types suggest that the site was used by people from the Santa Fe River Valley.

PART I. ARCHAEOLOGICAL TESTING OF THREE SITES,  
LA 84787, LA 84793, AND LA 86159

The results of archaeological testing at LA 84787, LA 84793, and LA 86159 indicate that the sites had the potential to yield significant information on prehistoric use of the Las Campanas area. A pre-testing site description, revised site description, specific field methods, testing results, and conclusions are presented. Recommendations are provided in a subsequent section of the report. General field methods used for all sites are provided in Appendix 2.

## **LA 84787 (278-42)**

### Site Description

LA 84787 was originally recorded by Southwest Archaeological Consultants (Scheick and Viklund 1991:26) and is described as a lithic artifact concentration that is 40 m long by 40 m wide and covering 1,600 sq m. It is on a gentle, east-facing slope 30 to 40 m north of a drainage head. The artifact concentration consists of primary and secondary flakes that are predominantly chert but also include quartzite and Jemez obsidian. A projectile point base indicates a Basketmaker II affiliation dating between 100 B.C. and A.D. 400.

### Field Methods

LA 84787 was relocated within Estates V, Unit 3, using the SAC location plotted on the 1:100 aerial photograph. The site limit and artifact concentrations were defined by pinflagging the surface artifacts. Site limits were extended to include two other sites, LA 84788 and LA 84792. Six discrete artifact concentrations were defined.

A 1-by-1-m grid system was established that could be extended to all artifact concentrations. Subsurface testing within each artifact concentration was accomplished using a 1-by-1-m unit. A 1-by-1-m unit was placed in a high density area or in an area of functionally diagnostic artifacts such as ground stone. These units were surface collected and surface stripped. The units were hand excavated in 10-cm levels until no cultural material was recovered. General methods that were followed for hand excavation and excavation documentation are provided in Appendix 2.

### Testing Results

LA 84787 was identified as a lithic artifact concentration with an associated Basketmaker II period projectile point fragment. Late Archaic-Basketmaker II sites are the only pre-Puebloan period sites found in the Las Campanas area and they occur in low frequencies. Archaeological testing focused on determining if LA 84787 had data potential in the form of subsurface cultural deposits, intact artifact spatial relationships, or features.

### *Revised Description*

We located the LA 84787 area and pinflagged the surface artifacts. After pinflagging over 200 artifacts, we determined that LA 84787 was actually a continuous artifact scatter with six discrete concentrations. Two of the concentrations had been recorded as LA 84788 and LA 84792. There was not a clear break in the surface artifact distribution and five of the six artifact concentrations appeared to be contemporaneous, all three sites were combined into LA 84787.

The redefined and larger LA 84787 is 180 m long north to south; site width was between 25 and 90 m (Fig. 2). Site area is 10,080 sq m using an average site width of 55 m. The site is on the flattest portion of a broad grassy ridge. The ridge has gentle slopes that are piñon-juniper covered. The ridge-top soil is a consolidated clay loam with sparse gravel and cobbles. The eroded and deflated ridge slopes have a sandy loam soil with abundant gravel and cobbles.

### *Area 1*

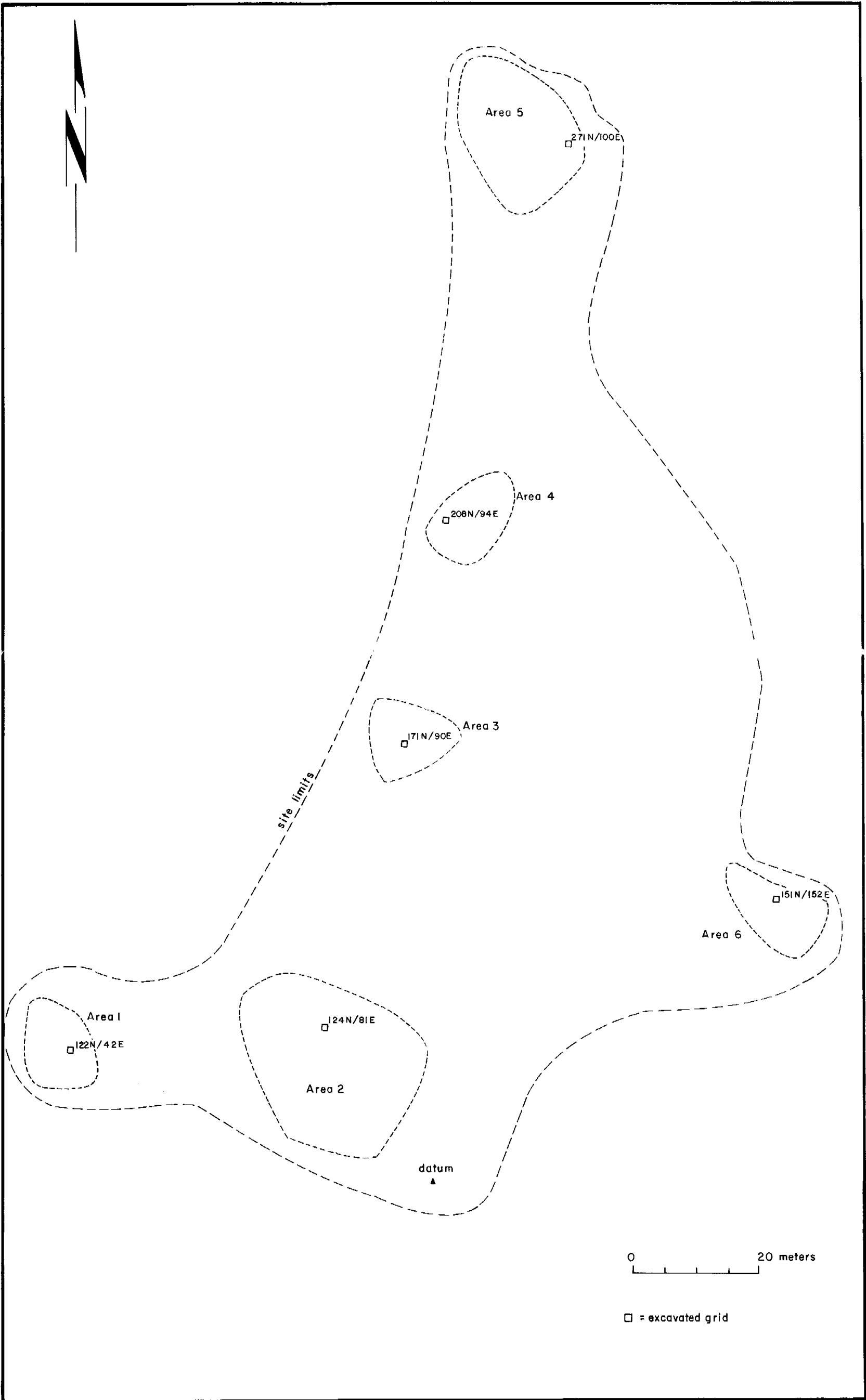
Area 1 is in the southwest corner of the site (Fig. 2). It is an artifact concentration that is 13 m long north to south by 11 m wide east to west. It may have 50 to 100 surface lithic artifacts and an equal number of subsurface lithic artifacts. The surface artifacts were core reduction flakes and angular debris of red and red-purple chert and pink-gray chalcedony. A multidirectional chert core and a medium-grained granite interior fragment of a metate were noted at the northeast edge of the concentration.

A 1-by-1-m unit was placed at the core and metate fragment location. The 1-by-1-m unit (122N/42E) was surface stripped to 5 cm deep revealing a loose light brown clay loam mixed with abundant pea gravel. Level 1 (0 to 10 cm below the surface strip) revealed a consolidated, blocky clay loam with a low sand and organic material content. A single multidirectional core was recovered from the upper 2 cm of the level. Level 2 (11 to 20 cm below the surface strip) revealed a strong brown granular and blocky clay loam with a moderate calcareous content that increased in the lower 5 cm. No artifacts were recovered from this level and excavation was halted.

The artifact assemblage recovered from 122N/42E consisted of three cores and a slab metate fragment. No small lithic reduction debris was recovered from the test unit. Two cores had multidirectional striking platforms. One specimen is made from chert and the other from quartzite. The third core had a single platform and was made from chert. The cores ranged from small (maximum dimension 40 to 69 mm) to medium (maximum dimension 70 to 99 mm). The small, multidirectional chert core was exhausted.

The clustering of these angular artifacts on the edge of the artifact concentration suggests that there are intact spatial relationships reflecting discard patterns and activity area structure. The late Archaic period sites from the Cochiti Dam excavations had a repetitive pattern of large core reduction debris occurring outside the main small tool manufacture debitage concentration

Figure 2. LA 84787, site map.





(Camilli 1979:339-353). The small lithic reduction debitage pattern formed an arc around an activity area that was centered on a hearth or fire-cracked rock concentration. This pattern was usually associated with residential sites rather than special activity sites. The absence of evidence for a thermal feature indicates that Area 1 may be a special activity locus. If this is so, then there may be activity area structural differences between the Las Campanas sites and the Cochiti Dam sites.

Archaeological testing of Area 1 suggests the potential for intact spatial relationships that may reflect activity area organization. The spatial integrity of the pattern may represent a single occupation episode. This spatial distribution is similar to an artifact distribution pattern recognized for Cochiti Dam late Archaic period residential sites. Area 1 lacked other diagnostic characteristics of residential sites suggesting a different site structure pattern for Las Campanas activity loci. Though no temporally diagnostic artifacts were recovered, Area 1 is interpreted as a late Archaic-Basketmaker II component based on the presence of similarities with the other LA 84787 activity areas. Similarities include artifact and material types, an abundance of core reduction debitage and a circular or oval artifact distribution pattern.

### *Area 2*

Area 2 is located in the southern portion of the site, 25 m west of Area 1 (Fig. 2). It is 30 m long north to south by 30 m wide east to west with an irregular, oval distribution. It may have 200 to 300 surface lithic artifacts and an equal or greater number of subsurface lithic artifacts. The surface artifacts were core and biface reduction flakes and angular debris, multidirectional cores, utilized flakes, biface fragments, and two late Archaic period projectile points. The lithic raw material types included red banded, yellow-brown, and gray chert, basalt, chalcedony, and obsidian. A few of the chert core flakes may have been heat-treated.

A 1-by-1-m unit was placed at 124N/81E in a high density area. The unit was surface stripped to 5 cm below ground surface, revealing a loose, light brown, sandy clay loam mixed with abundant pea gravel. Four core flakes of different chert varieties were recovered. Level 1 (0 to 10 cm below the surface strip) revealed a consolidated, blocky clay loam with a low sand and organic material content. Six core flakes and two pieces of angular debris were recovered. One core flake was made of basalt vitrophyre, which is a common material type from along the Rio Grande (Warren 1979a:57). Level 2 (10 to 20 cm below the surface strip) soil was similar to Level 1. The soil became very clayey and displayed a grayish brown color with moderate calcareous inclusions at 20 cm below the surface strip. Two chert cores and three core flakes were recovered. The two cores occurred immediately above the soil change suggesting that this level marks the bottom of the Archaic occupation level. Level 3 (21 to 30 cm below surface strip) was a continuation of the soil described for the bottom of Level 2. This soil is a blocky, granular clay loam that is moderately to highly calcareous. No artifacts were recovered from this level and excavation was halted.

The artifact assemblage recovered from Area 2 reflects core reduction and biface manufacture using local lithic raw material. Chert is the dominant raw material with only one piece of chalcedony recovered. Raw material texture is not dominated by any one material quality. Fine-grained (n=8), medium-grained (n=7), and coarse-grained (n=5) are present.

Artifact types include one piece of angular debris, fifteen core flakes, one biface manufacture flake, and two cores. Expedient core to flake lithic reduction is typified by a core flake dominated assemblage. A core to flake reduction trajectory is typical on Las Campanas sites where local raw material is abundant. Lithic raw material is abundant within the upper Middle Rio Grande Valley indicating that hunting and gathering forays would not have required a biface manufacturing technology combined with a curated tool strategy.

All stages of core reduction are indicated by the distribution of dorsal cortex percentages, dorsal scar counts, and core flake platforms. Dorsal cortex percentages are dominated by noncortical artifacts (n=16). Two artifacts have 10 percent dorsal cortex and three artifacts have 30 percent dorsal cortex. Early stage core reduction or decortication is not represented suggesting a greater focus on middle or late stage core reduction. The occurrence of two exhausted cores supports this observation. Artifact dorsal scars are distributed in the low and middle frequency range with two dorsal scars (n=7) and one dorsal scar (n=4) and three dorsal scars (n=4) the most common. Dorsal scar counts were no greater than five. The low dorsal scar count is a reflection of simple or expedient core reduction and perhaps small raw material or core size.

Flake platforms include single faceted (n=11), cortical (n=1), and multifaceted (n=1) types. Single-faceted flake platforms are typical of simple or expedient core reduction. The flake platform distribution corresponds with the dorsal scar count and dorsal cortex percentage distributions, although a greater frequency of cortical debitage would be expected if early stage core reduction predominated. This suggests that material was brought to the site as partly reduced cores since suitable raw lithic material is not abundant in the immediate area.

The dorsal scar count data suggests that raw material was brought to the site, reduced, or was transported in a smaller form that might condition how many flakes could be removed from a core striking platform. Whole core flake length was used as an index to see if the small artifact size influenced dorsal scar count frequency. Of the nine whole core flakes, seven are less than 30 mm long. This suggests that small raw material or cores were brought to the site.

Two projectile points similar to late Archaic period styles described for the Cochise Culture were found. One projectile point is similar to the San Pedro projectile point style (Sayles 1983; Dick 1965). The style could also be assigned to the Armijo phase of the Oshara tradition since a similar example is shown in Irwin-Williams (1973, fig. 5d). The LA 84787 specimen has a narrow, long convex-convex blade with very shallow corner notches. The base is parallel-sided and convex. The point is complete and measures 37 mm long by 13 mm wide by 5 mm thick. This point style is considered to be diagnostic of the late Archaic period (1800 to 800 B.C.).

The second projectile point is similar to the San Augustin style of the San Pedro stage of the Cochise Culture. This style is not well understood but is associated with sites of cultural strata that date from 1100 to 600 B.C. (Dick 1965). A similar example is shown in Irwin-Williams (1973, fig. 6e). This style is associated with En Medio phase sites which temporally would place it at the late end of the span suggested for San Augustin style points from the Albuquerque and Socorro Districts. The LA 84789 specimen is made from obsidian with a short triangular blade, very shallow corner-notches and a parallel-sided, straight stem that is broken at the base. It measures 27 mm long by 17 mm wide by 4 mm thick. The partial stem is 8 mm long and 10 mm wide. This point style is contemporaneous with the first projectile point dating to the late Archaic period (1800 to 800 B.C.).

Area 2 appears to be a late Archaic limited base camp or a heavily used limited activity site. The test excavation yielded 19 artifacts from a 1-by-1-m unit. The 19 artifacts per square meter translates into an area artifact assemblage of 1,000 to 9,000 items depending on the actual artifact distribution. The artifact quantity must have accumulated from more than a brief occupation. This supports a base camp interpretation or suggests that the assemblage represents multiple occupations during the late Archaic period. The relatively clustered, homogenous distribution of the surface artifact concentration favors a single occupation interpretation rather than multiple occupations that would have resulted in high density clusters within Area 2. More generalized activities are suggested for Area 2 based on the evidence for an expedient core to flake technology. A late Archaic period occupation is indicated by the projectile point styles. Area 2 may be one of the earlier components found in the Las Campanas area. Other late Archaic components, such as LA 84758 and LA 86148, date to the En Medio phase or Basketmaker II period (800 B.C. to A.D. 400).

### *Area 3*

Area 3 is located along the west margin of the site, 35 m north of Area 2 and 25 m south of Area 4 (Fig. 2). It was not found during the original inventory. It is 14 m long north to south by 14 wide east to west with a subtriangular or irregular oval distribution. It may have 60 to 100 surface lithic artifacts. The surface artifacts were core reduction flakes, angular debris, multidirectional cores, utilized flakes, and a temporally nondiagnostic, obsidian biface base. The lithic raw material types included red banded, yellow-brown, and gray chert, basalt, chalcedony, and obsidian.

A 1-by-1-m test unit (171N/90E) was placed in an area of high artifact density. The top 5 cm of soil and grass were removed. The soil was a loose, clayey loam mixed with gravel and roots. Five core flakes were recovered. Level 1 (0 to 10 cm below the surface strip) was a clayey, sandy loam that was homogeneous except for occasional pea gravel. Four lithic artifacts were recovered from Level 1. Level 2 (11 to 20 cm below the surface strip) was a brown to dark brown consolidated, blocky, clay loam that was homogeneous except for an occasional pebble or calcareous inclusion. No artifacts were recovered and excavation was halted.

The artifact assemblage recovered from Area 3 reflects core reduction and biface manufacture using local, raw lithic material. Chert is the dominant raw material with only one piece of basalt vitrophyre recovered. Basalt vitrophyre is common in and on the margins of the Rio Grande canyon. It often was the most common raw material type in Cochiti Dam site assemblages. Raw material texture is not dominated by any one material quality. Fine-grained (n=8), medium-grained (n=7), and coarse-grained (n=5) materials are present.

Artifact types include two pieces of angular debris, nine core flakes, and two biface manufacture flakes. Expedient core to flake lithic reduction is typified by a core flake dominated assemblage. A core to flake reduction trajectory is typical on Las Campanas sites where local raw material is abundant. Lithic raw material is generally abundant within the upper Middle Rio Grande Valley so that hunting and gathering forays would not have required a biface manufacturing technology combined with a curated tool strategy.

Middle stage core reduction is indicated by the distribution of dorsal cortex percentages, dorsal scar counts, and core flake platforms. Dorsal cortex percentages are dominated by noncortical artifacts (n=10). Two artifacts have 10 percent dorsal cortex and one artifact has 100 percent dorsal cortex. Artifact dorsal scars are distributed in the low and middle frequency range with three dorsal scars (n=5), one dorsal scar (n=3), and two dorsal scars (n=2) the most common. There were no dorsal scar counts greater than 5. The low dorsal scar count is a reflection of simple or expedient core reduction and perhaps small raw material or core size.

Flake platforms include single-faceted (n=5), cortical (n=2), and multifaceted (n=1) types. Single-faceted flake platforms are typical of simple or expedient core reduction. The flake platform distribution corresponds with the dorsal scar count and dorsal cortex percentage distributions.

The dorsal scar count data suggest that raw material was brought to the site reduced or in a small form that might condition how many flakes could be removed from a core striking platform. Whole core flake length can be used to examine if small artifact size could be influencing dorsal scar count frequency. Only two artifacts were larger than 30 mm. This suggests that small raw material or cores were brought to the site.

Area 3 did not yield temporally diagnostic artifacts or a substantially higher artifact density in the subsurface than was observed on the surface. Lithic artifacts were recovered from Level 1 indicating a limited cultural deposit depth. The area function focused on general subsistence activities and is evidenced by a single utilized flake fragment combined with an expedient core to flake reduction strategy. Area 3 is similar to the other lithic concentrations and they are probably contemporaneous.

#### *Area 4*

Area 4 is a lithic artifact concentration with an oval-shaped distribution of surface artifacts (Fig. 2). It is 17 m long north to south by 15 m long east to west. The surface artifact assemblage has between 50 and 100 artifacts. The lithic raw material types include red and red banded chert, purple chert, black quartzite, black basalt, gray and white chalcedony, and silicified wood. The surface lithic artifact types include core flakes, angular debris, core fragments, utilized core flakes, and facially modified tool fragments.

A 1-by-1-m unit was placed in a high density area within the lithic concentration. The 1-by-1-m unit (208N/94E) was surface stripped to 5 cm below ground surface, revealing a loose, light brown, clay loam mixed with abundant pea gravel. Five lithic artifacts were recovered from the surface and six lithic artifacts were recovered from the surface strip. Level 1 (0 to 10 cm below the surface strip) revealed a lightly compacted, sandy clay loam with a homogeneous texture. Five lithic artifacts were recovered from Level 1. A single multidirectional core was recovered from the upper 2 cm of the level. Level 2 (11 to 20 cm below the surface strip) revealed a strong brown granular and blocky clay loam with a moderate calcareous content that increased in the lower 5 cm. No artifacts were recovered from this level and excavation was halted.

Sixteen lithic artifacts were recovered from 208N/94E. The lithic raw materials included chert, chalcedony, and nonvesicular basalt. The chert and chalcedony could have been obtained from the local tertiary gravel deposits. The nonvesicular basalt is common along the Rio Grande and was the main lithic raw material recovered from late Archaic and temporally nondiagnostic lithic artifact scatters at Cochiti Dam (Kemrer and Kemrer 1979). The lithic raw material is mainly fine grained (n=10) with fewer medium-grained specimens (n=6).

The lithic artifact types from 208N/94E were dominated by core flakes and angular debris. A single multidirectional core was recovered. The lithic artifacts tend to be small and blocky as evidenced by a mean length of 26 mm, a mean width of 20 mm, and a mean thickness of 10 mm. Early and middle stages of core reduction are indicated by core flakes with 10 to 60 percent dorsal cortex, a predominance of single-faceted flake platforms and artifact dorsal scar counts ranging from 0 to 6. These attribute frequencies reflect a simple or expedient core to flake reduction trajectory. The small artifact sizes reflect raw material size and the transport of cores on-site for flake tool production.

Area 4 did not yield temporally diagnostic artifacts but did yield a substantially higher artifact density in the subsurface than was observed on the surface. Lithic artifacts were recovered from Level 1 indicating a limited cultural deposit depth. General subsistence activities are evidenced by a single utilized flake fragment combined with an expedient core to flake reduction strategy. Area 4 is similar to the other lithic concentrations and they are probably contemporaneous.

#### *Area 5*

Area 5 is located at the north end of the site (Fig. 2). It is a dispersed lithic artifact scatter that covers an area 18 m north to south by 25 m east to west. There were 25 to 50 surface artifacts consisting of chert and chalcedony core flakes and angular debris. A Basketmaker II style projectile point was collected by SAC during the inventory. No other temporally diagnostic artifacts were retrieved. The artifact density and lithic raw material diversity is lower than Areas 1 through 4.

A 1-by-1-m unit (271N/109E) was placed in the east half of the artifact scatter. The top soil was loose, sandy clay loam mixed with abundant gravel and an occasional cobble. Three lithic artifacts were recovered from the surface strip. Levels 1 and 2 (0 to 20 cm below the surface strip) consisted of a compact, homogeneous, blocky clay loam that becomes more calcareous with greater depth. No artifacts were recovered from Levels 1 and 2. Excavation was halted.

The three lithic artifacts were a chert core flake and two chert hammerstone spalls. The hammerstone spalls exhibit crushing on one or more ridges. The spalls may result from hard hammer core reduction or from a productive activity requiring pounding or the crushing of hard or pulpy raw material. The hammerstone spalls are an indication that food gathering and processing were not the only activities during the late Archaic-Basketmaker II occupation.

## *Area 6*

Area 6 is at the east edge of the site on a gentle, east-facing slope (Fig. 2). The area is eroded and deflated with abundant gravel and cobbles exposed on the surface. It is a core reduction area that is 7 m north to south by 17 m east to west. The artifact assemblage consists of 15 cores, core flakes, and large pieces of angular debris of gray-brown chert and quartzite. It appears that two large pieces of raw material were reduced.

A 1-by-1-m unit was placed in the area of highest density within the concentration. The surface consisted of a loose sandy loam mixed with abundant gravel and cobbles. Eight artifacts were collected from the surface. No artifacts were recovered from the surface strip. Level 1 (0-10 cm below surface strip) was yellowish brown sandy loam with calcareous inclusions, gravel and roots. No artifacts were recovered. Excavation was halted at this level.

Five pieces of chert and one piece of quartzite were recovered from the surface. The chert artifacts are from the same large piece of raw material. The quartzite artifact is a bidirectional core. The large size of the flakes and the heterogeneous material texture suggest that the raw material was reduced to large, suitable pieces of raw material that were transported off-site. The large size of the raw material indicate that the chert nodule may have been procured on-site. There is no evidence of activities besides core reduction.

Area 6 is a small core reduction area that contained debris from the reduction of two pieces of raw material. The debris resulted from a single occupation. There was no other evidence of later stage core reduction or tool use. The Area 6 concentration is not similar to Areas 1 through 5 and may date to the Coalition or Classic period based on the highly expedient and wasteful core reduction strategy.

## Conclusions

LA 84787 is the largest late Archaic-Basketmaker II period site in the Las Campanas project area. Areas 1 through 5 have similar raw material and artifact type distributions. Areas 2 and 5 yielded projectile points of late Archaic styles indicating an occupation that occurred between 1800 and 600 B.C. This long span is probably an overestimate of the actual interval between site occupations given the great similarity between the artifact assemblages. Areas 1 through 5 may be limited base camps. The lithic assemblages reflect a more general range of activities rather than specific activities such as hunting or plant food processing. Test excavations indicated that Areas 2, 3 and 4 have the potential to yield equal or greater numbers of artifacts than were observed on the surface. Areas 1 and 5 exhibited a shallower cultural deposit but more functionally diagnostic artifacts. Areas 1 through 4 are expected to have the greatest comparative potential between areas and other sites in the Las Campanas area.

Area 6 is more similar to raw material procurement sites that were abundant in Estates I and II. Two large pieces of chert and quartzite were reduced for cores or flakes that could be used elsewhere. This reduction pattern has been found in association with Coalition and Classic period pottery types. Area 6 is probably not contemporaneous with Areas 1 through 5 and did not yield subsurface artifacts.

Site Description

LA 84793 was originally recorded by SAC and is described as a multicomponent, dispersed sherd and lithic artifact scatter with two checkdams and one concentration of artifacts (Scheick 1991:28-29). The site is located at the base of a southeast-facing ridgeslope extending to a flat drainage bottom at the edge of the tree line. Vegetative cover is piñon-juniper woodland and the soils are sandy with accompanying pea gravel.

The artifact scatter is 40 m long by 35 m wide and covers 1,400 sq m. Artifacts extend halfway upslope from the wide grassy draw to the ridge top. The artifact concentration is at the northwestern end of the site among the trees and is 7 m long by 4 m wide. Artifacts within the concentration include nine Galisteo Black-on-white bowl sherds, chert secondary flakes, and a Jemez obsidian biface. Other artifacts located within the site are five Santa Fe Black-on-white bowl sherds and some chert secondary flakes. The Galisteo Black-on-white bowl sherds and Santa Fe Black-on-white bowl sherds date to the Coalition and early Classic period of A.D. 1175 to 1400.

Field Methods

LA 84793 was relocated within Estates V, Unit 3, using the SAC location plotted on the 1:100 aerial photograph. The site limit and artifact concentrations were defined by pinflagging the surface artifacts. Concentrations were relocated for test excavation by defining the site limits. Two sherd concentrations and one lithic artifact concentration were located.

Archaeological testing consisted of three 2-by-2-m units placed in the sherd and lithic artifact concentrations. These units were surface stripped in 1-by-1-m units. A 1-by-1-m unit was placed in the area that yielded the most numerous or diverse artifact assemblage for two concentrations. A third concentration yielded a subsurface thermal feature (Fig. 3).

Feature excavation proceeded by exposing the top of the feature and the area immediately surrounding it within the excavation unit. The 1-by-1-m unit cross-sectioned the feature providing a profile of the feature fill and the opportunity to collect ethnobotanical samples for identification of charred plant and wood material. A sketch plan and profile show the stratigraphy, fire-cracked rock locations, and the exposed feature morphology (Fig. 4). The feature description includes provenience, dimensional, soil matrix, artifact, construction, temporal, excavation technique, and other data. Excavation photographs were taken of the feature. These included a metric scale, north arrow, and a mug board with the I.A and feature number and date.

Surface lithic artifacts were recorded by morphological and technological attributes outlined in the Lithic Artifact Analysis manual (OAS Staff 1990). Pottery types from outside the excavation areas were recorded but were not collected.

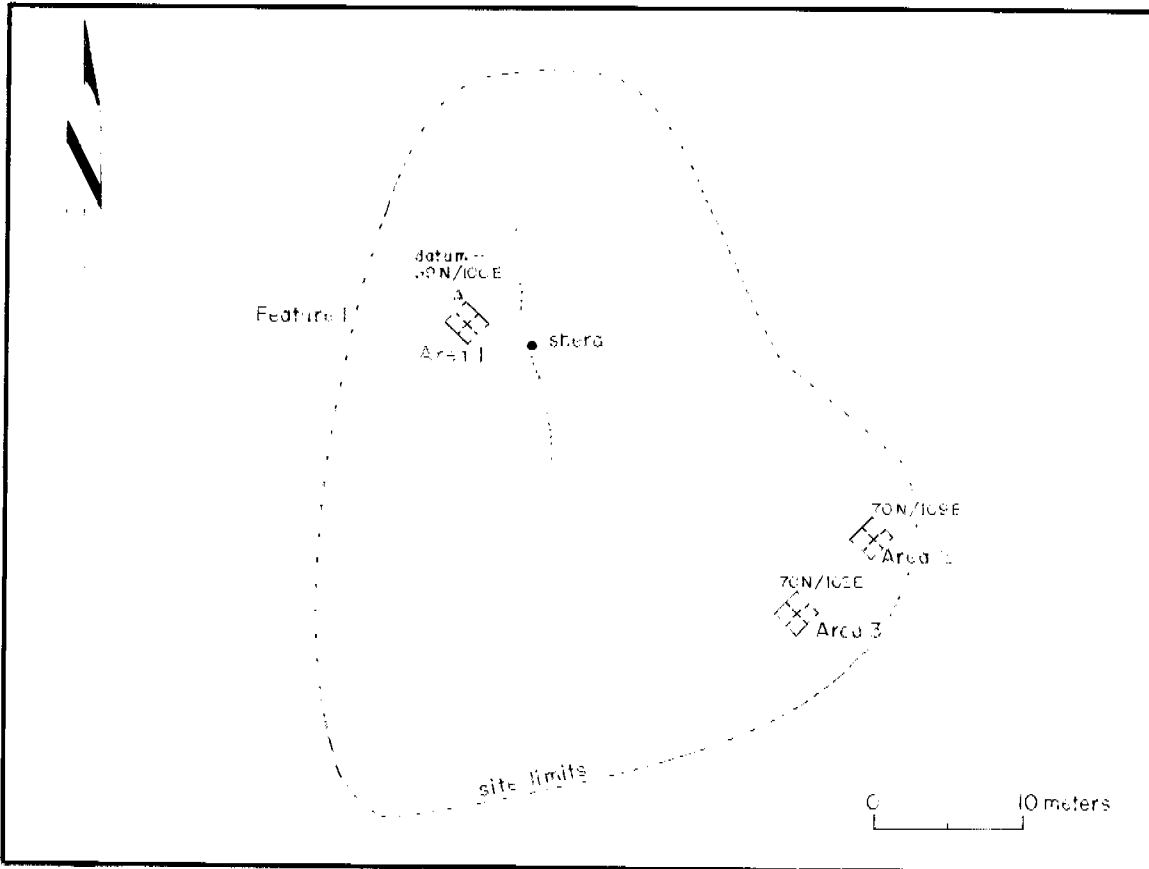


Figure 3. LA 84793, site map.

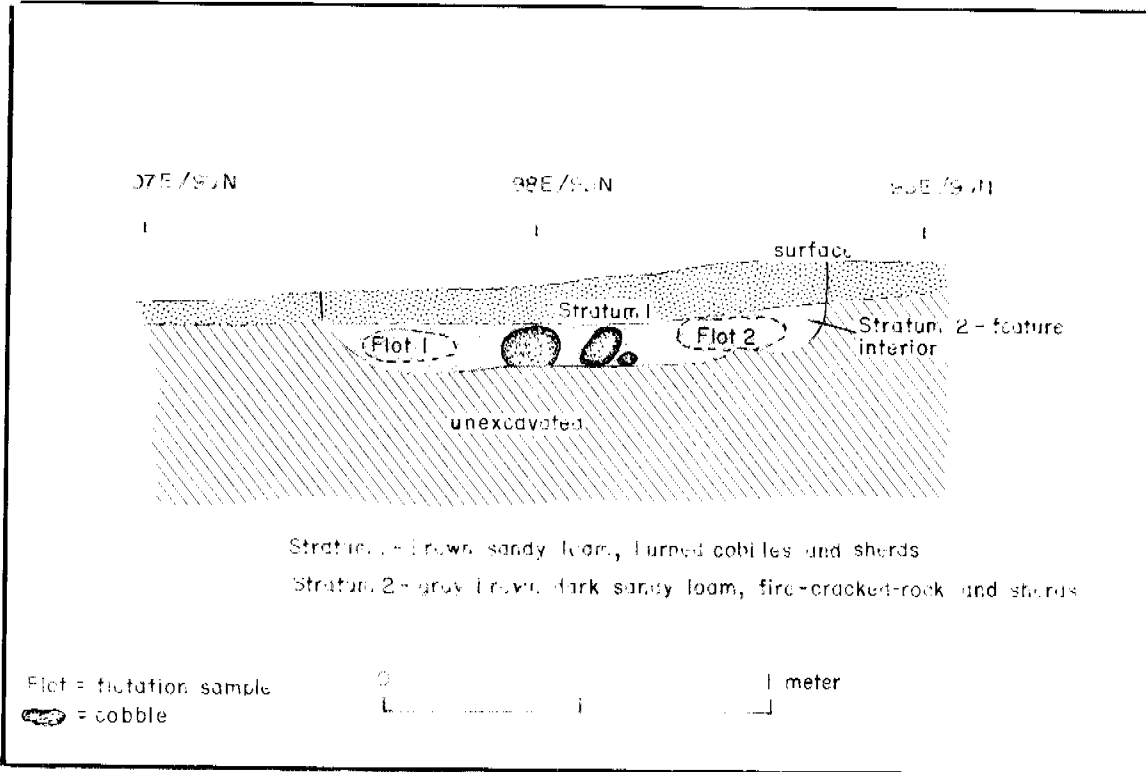


Figure 4. Profile of Feature I, LA 84793.



## Testing Results

LA 84793 was identified as a dispersed sherd and lithic artifact scatter with at least three concentrations. The pottery types were Santa Fe and Galisteo Black-on-white, which date to the Coalition and early Classic periods (A.D. 1175 to 1400). Archaeological testing focused on the artifact concentrations to determine the depth and extent of the cultural deposit and to determine if intact subsurface features were present.

### *Revised Description*

An examination of the site surface showed that LA 84793 was as described by the initial inventory. Three artifact concentrations were located with an associated dispersed artifact scatter. The dispersed scatter consisted primarily of lithic artifacts. The distribution pattern of sherd concentrations associated with a dispersed lithic artifact scatter is common for Las Campanas area sites (Post 1992). The site measured 45 m north to south by 40 m east to west, which is only slightly larger than was reported by the survey (Fig. 3). The concentrations were on a gentle east-facing slope above a wide, grassy draw that separates two low, broad, finger ridges. The soil on the gentle slope was a sandy loam mixed with gravel and an occasional cobble. The surface was deflated and cut by numerous shallow erosion channels. One channel cut through the sherd concentration at 99N/100E, redepositing the sherds 10 to 12 m downslope.

### *Area 1*

Area 1 is a sherd concentration that was cut by a shallow erosion channel redepositing the sherds 10 to 12 m downslope. The sherds were all Santa Fe Black-on-white pottery and are from two bowls. There was no soil staining or obvious fire-cracked rock visible on the surface in this area.

The 2-by-2-m test excavation unit (99N/100E) was placed at the top of the erosion-dispersed sherd concentration. Surface stripping of the upper 5 cm of loose top soil yielded 33 sherds of Santa Fe Black-on-white pottery representing two bowls. The top soil was a sandy loam that was mixed with pea gravel and an occasional cobble. This modern soil level is on top of a sandy loam that is mixed with abundant gravel and cobbles. A gray stain was present at the bottom of the surface. The soil stain was in the west half of 98-99N/100E. The soil stain contained charcoal and fire-cracked cobbles. The stain was excavated within 98-99N/100E, providing a stratigraphic and vertical profile of the feature.

Feature 1 appeared to be an oblong or trough-shaped pit. It had steeply sloping sides with an irregular bottom. The feature measured 1.20 m long north to south with a partially excavated width of 40 cm and a depth of 13 cm (Fig. 4). It was intact except for a rodent burrow in the east wall. The calcareous deposits in the bottom and side wall were hardened and oxidized. The feature fill was a mix of primary fill that included five potsherds, less than ten fire-cracked rock spalls, three fire-cracked cobbles, and less than ten pieces of wood charcoal. The soil was homogeneous, dark gray to gray-brown sandy loam.

The Area 1 artifact assemblage was dominated by sherds of Santa Fe Black-on-white pottery. A total of 38 sherds from two bowls were recovered. Six of the sherds were rim fragments and the remainder were body fragments.

Vessel 1 represents 36 sherds from a single bowl. Five rim sherds and 31 body sherds are present. The paste is fine-grained with temper or natural inclusions of clear to smoky quartz in a white ground mass. Clear to gray feldspar is common. Black and brown biotite mica is present to abundant. Yellow calcium carbonate inclusions and gray clay platelets are present. This temper type is similar to Type 2 described by Lang (Lang and Scheick 1989:62) for Santa Fe Black-on-white pottery from the Agua Fria Schoolhouse site (LA 2). The interior has a light gray, streaky slip with a medium luster polish. The carbon paint design is a series of contiguous, opposed, solid and hatched, oblique triangles. The rim is slightly everted to flat. The bowl exterior is well smoothed with a streaky polish.

Seventeen sherds have at least one edge that exhibits a fracture angle of 45 degrees or less. This fracture pattern is similar to a pattern found on sherds associated with pottery-firing kilns in the Mesa Verde area. This pattern may indicate the shattering of a "green" vessel during firing. More research is needed on vessel breakage patterns before it can be conclusively stated that Vessel 1 represents a pottery misfire.

Vessel 2 is represented by two sherds: a rim fragment and a body fragment. The paste is fine grained and vitrified. The paste contains quartz and feldspar grains with clear glass bubble rim and irregular or forked glass flakes, rounded clay pellets of biotite mica and hornblende particles. This temper is similar to Type 4 described by Lang (Lang and Scheick 1989:62) for Santa Fe Black-on-white pottery from the Agua Fria Schoolhouse site (LA 2). Lang suggested that the source for the temper or clay was along the east margins of the Pajarito Plateau. The interior surface is smoothed with a streaky slip and polish. The exterior surface is well-smoothed with a streaky polish. The carbon paint design is a series of widely spaced, narrow, diagonal lines framed by vertical lines that are of equal width. The widely hatched element is pendant from a horizontal framing line that is 10 mm below the rim. The rim is pinched and undecorated.

A single lithic artifact was retrieved from Area 1. It is a piece of fine-grained chert angular debris that was 47 mm long by 25 mm wide by 15 mm thick. It is not known if the angular debris is associated with the feature or was discarded later.

Area 1 consists of an activity area with a sherd concentration representing two bowl fragments associated with a partly excavated thermal feature. The sherds are of Santa Fe Black-on-white pottery which was the common pottery type at Pindi Pueblo (LA 1) between A.D. 1270 and 1300 (Stubbs and Stallings 1953:23). Feature 1 is a shallow, steep-sided pit with a small amount of interior, fire-cracked cobbles and associated fire-cracked rock. The distinctive breakage pattern of the Vessel 1 Santa Fe Black-on-white bowl sherds suggests that they shattered during firing. Additional research must be completed to determine the function of thermal features similar to Feature 1 and the breakage pattern of Santa Fe Black-on-white under variable thermal conditions.

### *Area 2*

Area 2 was a concentration of Santa Fe Black-on-white pottery located 29 m south and east of Area 1 (Fig. 3). The Santa Fe Black-on-white pottery is from a different bowl vessel than Vessels 1 and 2 described for Area 1. The immediate area is eroded and deflated with a loose, modern, sandy loam mixed with gravel and cobbles.

A 2-by-2-m test excavation unit was placed at 70N/109E to determine if there was a substantial deposit of subsurface sherds or an associated feature. Surface collection and surface stripping yielded 13 sherds. The surface stripped soil was a yellow-brown, sandy loam with abundant pea gravel, occasional cobbles and calcareous inclusions indicating substantial surface deflation. A 1-by-1-m unit, 69N/108E, was excavated to 10 cm below the surface strip. The soil was loose, homogeneous sandy loam with calcareous inclusions abundant at the bottom of the level. No artifacts were recovered from Level 1 and excavation was halted.

The artifact assemblage from Area 2 consisted of 13 sherds of Santa Fe Black-on-white pottery. These sherds were from the same bowl fragment. The 13 sherds included 5 rim fragments and 8 body fragments. The rim is rounded and undecorated. The gray paste is fine-grained and hard. The paste contains quartz and feldspar grains with clear glass bubble rim and irregular or forked glass flakes, rounded clay pellets of biotite mica and hornblende particles. This temper is similar to Type 4 described by Lang (Lang and Scheick 1989:62) for Santa Fe Black-on-white pottery from the Agua Fria Schoolhouse site (LA 2). Lang suggested that the source for the temper or clay was along the east margins of the Pajarito Plateau. The interior has a streaky to thick light gray to white slip with a light to medium streaky polish. The exterior is well-smoothed with a medium polish. The carbon paint design consists of triangle and band designs of opposing thin lines with diagonal hatchure and solid filler. A 5 to 8 mm wide solid band encircles the bowl and is pendant from the rim.

Archaeological testing of Area 2 only yielded a sample of Santa Fe Black-on-white pottery. There was no depth to the cultural deposit and no features were exposed. Area 2 was a limited activity area perhaps used for processing gathered plant resources before transporting them to the village site. The Santa Fe Black-on-white pottery has paste characteristics that would suggest an origin nearer to the Pajarito Plateau than the Santa Fe River Valley. The distribution of tuff-bearing geological deposits must be better understood before we can explain its distribution on sites located between the Santa Fe River and the Rio Grande. Santa Fe Black-on-white pottery dates from A.D. 1175 to 1400, but was the primary pottery type at Pindi Pueblo (LA 1) between A.D. 1270 and 1300 (Stubbs and Stallings 1953:23). Tuff-tempered pottery was most common in the early components at the Agua Fria Schoolhouse site (LA 2) though absolute dates for these components are lacking (Lang and Scheick 1989:64).

### *Area 3*

Area 3 was a concentration of lithic core reduction debris located 29 m south of Area 1 (Fig. 3). The lithic artifacts were in an area described in the survey report as having an obsidian biface. The biface was not relocated and may have been survey-collected. Area 3 is midway between the ridge top and the grassy draw that is to the south. The immediate area is eroded and deflated with a loose modern sandy loam mixed with gravel and cobbles.

A 2-by-2-m test excavation unit was placed at 70N/102E to determine if there was a substantial deposit of subsurface lithic artifacts or an associated feature. Surface collection and surface stripping yielded nine lithic artifacts. The surface stripped soil was a yellow-brown, sandy loam with abundant pea gravel, occasional cobbles and calcareous inclusions indicating substantial surface deflation. A 1-by-1-m unit, 69N/101E, was excavated to 10 cm below the surface strip. The soil was a loose, homogeneous, sandy loam with calcareous inclusions abundant at the bottom of the level. No artifacts were recovered from Level 1 and excavation was halted.

Nine lithic artifacts were recovered from 69N/101E. Fine-grained (n=6) and medium-grained (n=3) chert were the only raw materials found. Three different cores were partly reduced. One small piece of angular debris is from the same core as the core flake recovered from Area 1. This small piece may have washed downslope from Area 1. The chert could have been obtained from the local tertiary gravel deposits.

The lithic artifact types from 69N/101E were core flakes and angular debris. The lithic artifacts tend to be small as evidenced by a mean length of 24 mm, a mean width of 17 mm and a mean thickness of 5 mm. Middle stages of core reduction are indicated by core flakes with 0 to 60 percent dorsal cortex and a predominance of single-faceted flake platforms. These attribute frequencies result from a simple or expedient core to flake reduction trajectory. The small artifact sizes suggest the transport of partly reduced cores to the site for flake tool production.

A single utilized fine-grained core flake was identified. The utilized convex edge is 20 mm long but is broken. The edge angle is 50 degrees with unidirectional scarring indicating that the flake was used for scraping.

Area 3 is a lithic reduction area where small core flakes were produced for on-site use. The presence of only three distinct raw materials suggest that this is a single occupation. One piece of raw material may have eroded downslope from Area 1 or the larger core flake located in Area 1 may have been recycled from Area 3 for Area 1 activities. A brief occupation is indicated by the low artifact numbers and tight distribution. Area 3 is another example of an artifact distribution and assemblage reflecting the diurnal foraging strategy that was widely used in the Las Campanas area during the Coalition and Classic periods.

#### *General Site Lithic Artifact Scatter*

A dispersed scatter of lithic artifacts defines a large part of the site area. A total of 18 lithic artifacts were recorded in the field. These data can be described and compared with the Area 3 data in terms of reduction strategy and site formation.

The 18 lithic artifacts were all of local chert (n=17) and quartzite (n=1). The chert was medium grained (n=9) and fine grained (n=7) with a single coarse-grained item. The raw material texture distribution is probably a reflection of the material's variability rather than raw material preference. A single core or cobble of the local chert could have the full range of grain sizes.

The artifact types included core flakes (n=13), angular debris (n=4), and one multidirectional core. The surface lithic artifacts, when compared with the Area 3 assemblage,

tend to be larger and have greater size variability as indicated by the high variance values (609.8203 for length as an example). The mean length is 42 mm, mean width is 33 mm, and mean thickness is 16 mm. This pattern of high size variability may be a indication of an expedient core reduction strategy.

Variability in the core reduction stages is represented in the dorsal cortex percentages. Seven of the 13 core flakes exhibit dorsal cortex ranging from 10 to 100 percent coverage. This distribution can be compared with the Area 3 assemblage that had four of eight flakes exhibiting dorsal cortex ranging from 0 to 30 percent. The latter distribution seems to reflect more complete or later stages of core reduction while the surface artifact distribution reflects early stage reduction of raw material procurement.

Core flake platforms support the observations made for dorsal cortex and artifact size. Six of the whole core flakes have single-faceted platforms and there were no multifaceted platforms. Single-faceted platforms are common in expedient core to flake reduction strategies.

The surface lithic artifacts reflect a site occupation history consisting of many brief visits. Typically, the visits resulted in the discard of one or two lithic artifacts that formed the accumulation identified as the site scatter. Atypically, a visit resulted in a concentration such as are evidenced at Areas 2 and 3 or the construction and use of a formal feature as was found at Area 1. Based on the occurrence of Santa Fe Black-on-white pottery it is reasonable to assume that the artifact accumulation, concentrations, and feature construction occurred between A.D. 1175 and 1400 or probably more accurately between A.D. 1270 and 1360 when Pindi and the Agua Fria Schoolhouse pueblos were occupied.

### Conclusions

LA 84793 is a spatially extensive, but dispersed sherd and lithic artifact scatter with two sherd concentrations: a partly excavated thermal feature and a lithic artifact concentration. Archaeological testing within the three concentrations revealed shallow cultural deposits. Ceramic manufacture dates indicate occupations that occurred between A.D. 1175 and 1400 (Habicht-Mauche 1993). Excavation within Area 1 revealed a shallow thermal feature associated with Santa Fe Black-on-white pottery. Many of the Santa Fe Black-on-white pottery bowl sherds exhibit an unusual, angular breakage pattern that may result from misfiring during manufacture. The spatial association between the sherds and the thermal feature suggest that pottery-firing may have occurred on-site. Confirmation of pottery-firing at small sites in the Las Campanas area would be a major contribution to the archaeology of the northern Rio Grande and fill a gap in our knowledge of prehistoric Pueblo pottery manufacturing techniques.

## LA 86159

### Site Description

LA 86159 is a concentrated sherd and lithic artifact scatter. It is on a northeast-facing slope at the head of a minor drainage. The vegetation is piñon-juniper with assorted grasses, cholla and prickly pear cactus, snakeweed, and chamisa. The soil is sandy with gravel and occasional cobbles.

LA 86159 is 28 m long by 22 m wide and covers 616 sq m (Fig. 5). The artifacts include 4 chert secondary core flakes and 25 to 30 bowl sherds of Santa Fe Black-on-white pottery. It is not known how many vessels are represented by the sherds. Based on the manufacture dates for Santa Fe Black-on-white pottery, the site dates between A.D. 1175 and 1325 during the Coalition period of the Rio Grande sequence. The Las Campanas area experienced increased use during the Coalition period as evidenced by numerous small reoccupied hunting and gathering sites.

### Field Methods

LA 86159 was relocated within Estates V, Unit 2, using the SAC location plotted on the 1:100 aerial photograph. The site limit and artifact concentrations were defined by pinflagging the surface artifacts. Concentrations could be relocated for test excavation by defining the site limits. Three artifact concentrations were located: a sherd concentration with an associated soil stain, one sherd and lithic artifact concentration and one lithic artifact concentration. Two thermal features that were not closely associated with an artifact concentration also were identified.

Archaeological testing consisted of placing five 2-by-2-m units in or near the sherd and lithic artifact concentrations and thermal features. These units were surface stripped in 1-by-1-m units. The soil was screened through ¼-inch mesh, and the artifacts were bagged by 1-by-1-m grid designation. A 1-by-1-m unit was placed in the area that yielded the most numerous or diverse artifacts. Surface sherd and lithic artifacts located outside the excavation areas were not recorded because the site was expected to undergo additional study.

### Testing Results

LA 86159 was identified as a sherd and lithic artifact concentration restricted to a small area. The main pottery type was Santa Fe Black-on-white, which dates to the Coalition and early Classic periods (A.D. 1175 to 1400). Archaeological testing focused on the artifact concentrations to determine the depth and extent of the cultural deposit.

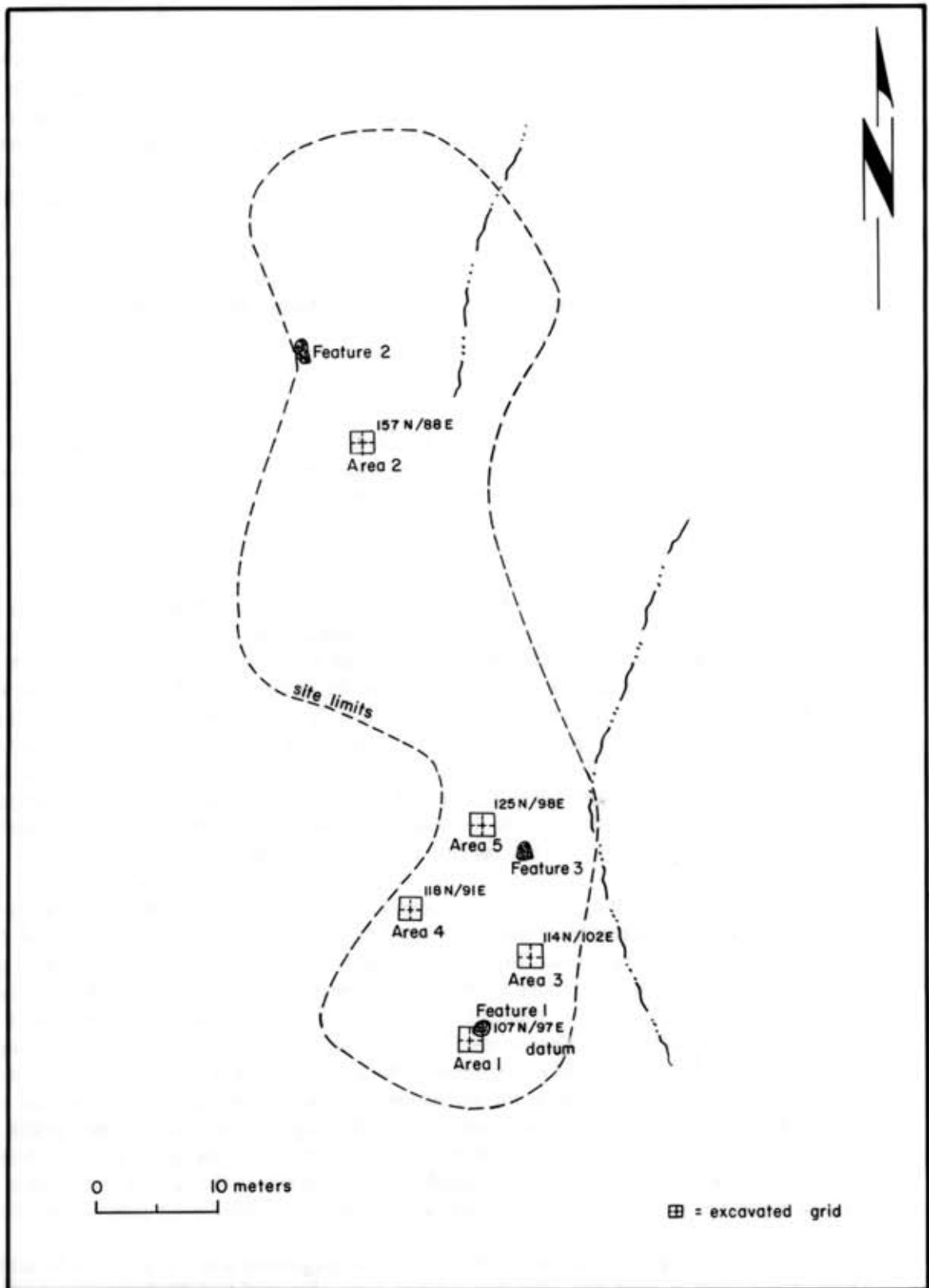


Figure 5. LA 86159, site map.

### *Revised Description*

An examination of the site surface showed that LA 86159 was spatially more extensive and archaeologically more diverse than originally recorded. The original artifact concentration (Area 1) was located, but an additional sherd and lithic artifact concentration (Area 5) and a lithic artifact concentration (Area 2) also were defined (Fig. 5). Three thermal features were identified. One feature was associated with the original artifact concentration; another thermal feature was near Area 5; and the third thermal feature was located 7 m northeast of Area 2. The site measured 83 m north to south by 25 m east to west, which is larger than was reported by the survey. The concentrations and features were on a gentle east-facing slope of a wide north to south ridge. The soil on the gentle slope was a sandy loam mixed with gravel and occasional cobbles. The surface was deflated and cut by numerous shallow erosion channels.

### *Area 1*

Area 1 is a sherd concentration that covers a 100 sq m area (Fig. 5). The sherds were all Santa Fe Black-on-white pottery and are from one bowl fragment. An area with charcoal stained soil is in the east part of the concentration. The stain may be the deflated remains of a thermal feature.

A 2-by-2-m test excavation unit was placed at 107N/97E to determine if there was a substantial deposit of subsurface sherds and to determine the extent of the charcoal stained soil. Surface collection and surface stripping yielded 57 sherds and 5 lithic artifacts. The surface stripped soil was a yellow-brown sand with abundant pea gravel and occasional cobbles. A 1-by-1-m unit, 107N/96E, was excavated to 20 cm below the surface strip. Level 1 (0-10 cm below the surface strip) was compacted, brown clay loam with pea gravel. The charcoal stain was restricted to the upper 5 cm and appeared to have migrated into the excavation area from the main portion of the feature. Fifty-seven sherds were retrieved from Level 1. Most of the sherds were small, angular fragments. Level 2 (11 to 20 cm below the surface strip) was a compacted, blocky clay loam. The gravel content decreased but calcareous inclusions were present. No artifacts were recovered from Level 2 and excavation was halted.

The artifact assemblage from Area 1 consisted of 114 sherds of Santa Fe Black-on-white pottery. These sherds were from the same bowl fragment. The 114 sherds included 1 rim fragment and 113 body fragments. The rim is rounded and undecorated. The gray paste is fine grained and hard. The paste contains quartz and feldspar grains with clear glass bubble rim and irregular or forked glass flakes, rounded clay pellets of biotite mica, hornblende lathes, and calcium carbonate inclusions. This temper is similar to Type 4 described by Lang (Lang and Scheick 1989:62) for Santa Fe Black-on-white pottery from the Agua Fria Schoolhouse site (LA 2). Lang suggested that the source for the temper or clay was along the east margins of the Pajarito Plateau. The interior is well smoothed with a light to medium streaky polish. The exterior is well smoothed with a medium polish. The carbon paint design consists of bands of opposing thin framing lines with diagonal hatchure and solid filler. The carbon paint ranges from black to a ghost gray. The ghost gray results from oxidation of the carbon paint during firing.

One intriguing aspect of the sherds is the breakage pattern that is present on 57 artifacts. These sherds have at least one edge that exhibits a fracture angle of 45 degrees or less. This



fracture pattern is similar to a pattern found on sherds associated with pottery-firing kilns in the Mesa Verde area. This pattern may indicate the shattering of a "green" vessel during firing. More research is needed on vessel breakage patterns before it can be conclusively stated that this represents a pottery misfire.

Five lithic artifacts were recovered from the surface strip. Four artifacts were pieces of local chalcedony angular debris. The fifth artifact was a core flake of Jemez Mountain obsidian. The lithic artifacts reflect an expedient core to flake reduction strategy. The chert angular debris ranges from small (maximum dimension of less than 19 mm) to medium (maximum dimension between 20 and 49). No inferences about activities associated with the hearth can be made from the lithic artifacts.

Area 1 is a sherd and lithic artifact concentration associated with a thermal feature. The sherds were present in the soil to a depth of 10 cm below the surface strip. All the sherds are from a single bowl fragment of Santa Fe Black-on-white pottery. The breakage pattern of the sherds may result from pottery firing or the exfoliation of a vessel with internal flaws that caused breakage during use. The breakage pattern is compelling because it is similar to a breakage pattern found on sherds associated with kilns in the Mesa Verde region. Determining the function of the thermal feature, identifying the cause of the unique fracture pattern, and defining the relationship between the sherds and the thermal feature will be primary research objectives in the treatment plan that is submitted as the second part of this report.

#### *Area 2*

Area 2 is in the north part of the site (Fig. 5). It is a lithic artifact concentration on a gentle southwest-facing slope above a shallow erosion channel. The soil is a sandy loam that is mixed with abundant gravel and cobbles.

A 2-by-2-m test excavation unit was placed at 157N/88E to determine if there was a substantial deposit of subsurface lithic artifacts and to determine if there were associated features. Surface collection and surface stripping yielded 16 lithic artifacts. The surface stripped soil was a yellow-brown sand with abundant pea gravel and cobbles. A 1-by-1-m unit, 156N/88E, was selected because it yielded nine lithic artifacts in the surface strip. The unit was excavated to 10 cm below the surface strip. Level 1 (0-10 cm below the surface strip) was compact brown clay loam with pea gravel and calcareous inclusions. The gravel content decreased from the initial abundance in the surface strip. Calcareous inclusions are present. No artifacts were recovered from Level 1 and excavation was halted.

Sixteen lithic artifacts were recovered from the 2-by-2-m unit. Lithic raw materials included local chert (n=11), chalcedony (n=2), quartzitic sandstone (n=2), and quartzite (n=1). Material textures were fine grained (n=7) and medium grained (n=9). The higher frequency of medium-grained material reflects the presence of quartzite and quartzitic sandstone. All lithic raw materials could have been obtained from the local tertiary gravel deposits.

The lithic artifact types were core flakes and angular debris. The lithic artifacts range from small to medium as evidenced by a length range of 19 to 43 mm, a width range of 14 to 30 mm, and a thickness range of 4 to 14 mm. Middle stages of core reduction are indicated by

core flakes with 0 to 50 percent dorsal cortex and a predominance of single-faceted flake platforms (four of six identifiable platforms). These attribute frequencies result from a simple or expedient core to flake reduction trajectory. The small to medium artifact sizes suggest the transport of partly reduced cores to the site for flake tool production.

Area 2 is a core reduction area consisting of locally available core flakes and angular debris. The concentrated distribution may result from a single occupation. The lithic artifacts are restricted to the surface and upper 5 cm of loose top soil. No temporally diagnostic artifacts were recovered from Area 2. The relatively high frequency of lithic artifacts recovered from the excavation suggests that a fairly large assemblage is present. The Area 2 assemblage should be valuable for comparative studies focusing in temporal differences in reduction strategies and spatial aspects of site formation and occupation history.

### *Area 3*

Area 3 was located downslope and north of Area 1 (Fig. 5). The sherd scatter present suggested that artifacts were washing downslope from Area 1. Area 3 excavation focused on determining if artifacts were eroding out of an intact deposit or were part of the slope wash deposit from Area 1.

A 2-by-2-m test excavation unit was placed at 114N/102E. Surface collection and surface stripping yielded ten sherds of Santa Fe Black-on-white pottery. The surface stripped soil was a loose redeposited sandy loam, mixed with abundant gravel and medium to large cobbles. A 1-by-1-m unit, 113N/101E, was selected because it yielded five potsherds in the surface strip. The unit was excavated to 10 cm below the surface strip. Level 1 (0-10 cm below the surface strip) was compacted, brown clay loam with pea gravel and calcareous inclusions. The gravel content decreased from the abundance in the surface strip but calcareous inclusions were present. No artifacts were recovered from Level 1 and excavation was halted.

The ten sherds of Santa Fe Black-on-white pottery were recovered from the surface and surface strip. All sherds were bowl body fragments. The sherds were from the same vessel found in Area 1. The paste, temper, surface treatment and design were the same. These sherds obviously washed downslope from Area 1.

Area 3 was a concentration of ten sherds of Santa Fe Black-on-white that had washed downslope from Area 1. No features were found at Area 2. It is likely that the sherds were dispersed by erosion rather than activities related to the use of Area 1. No further work is recommended for this portion of the site.

### *Area 4*

Area 4 was defined by a single trough metate fragment (Fig. 5). Metate fragments may be considered site furniture (Binford 1983a) and therefore indicate activity areas if they have not been moved. Area 4 test excavation focused on determining if the metate fragment was associated with an activity area.

A 2-by-2-m unit was placed at 118N/91E. The unit was surface stripped revealing a loose sandy loam with abundant pea gravel. No artifacts were recovered. Grid 118N/91E was excavated to 10 cm below the surface strip revealing sandy loam mixed with calcareous inclusions. The soil has undergone extensive root penetration. No artifacts were recovered from the subsurface and excavation was halted.

Area 4 did not yield additional artifacts or features in association with the metate fragment. The metate fragment may have been moved from a different activity area after the activity area was abandoned. No further work is recommended for this portion of the site.

#### *Area 5*

Area 5 is a sherd and lithic artifact concentration. The concentration is associated with Feature 3, a soil stain that is probably a thermal feature. The area is on a gentle north-facing slope, downslope from Areas 1 and 3 (Fig. 5). Test excavation focused on determining if there was depth to the cultural deposit and if there was a higher artifact density in the subsurface deposits.

A 2-by-2-m unit was placed at 125N/98E. The unit was surface stripped revealing a loose sandy loam with abundant pea gravel. Five sherds of Santa Fe Black-on-white pottery and three lithic artifacts were recovered. Grid 125N/98E was excavated to 10 cm below the surface strip revealing sandy loam mixed with gravel and calcareous inclusions. No artifacts were recovered from the subsurface and excavation was halted.

The excavation revealed a slightly higher density of artifacts in the surface strip than was apparent on the surface. Five sherds of Santa Fe Black-on-white pottery and three lithic artifacts of local chert were recovered.

The five sherds of Santa Fe Black-on-white pottery represent fragments of two bowls. Three sherds recovered from Grid 125/98E are from the vessel fragment in Areas 1 and 3. Two of these sherds show the same angular breakage pattern found on 50 percent of the Area 1 sherds. The location of these sherds is 25 m from Area 1 indicating post-depositional site disturbance such as erosion or livestock trampling.

Two sherds from 124N/98E and 125N/98E are different fragments of a bowl. The sherds fit together providing a view of the upper 5 cm of the bowl. The rim is pinched and flattened and decorated with elongated oval ticks. Flattened lips occur during all periods on Santa Fe Black-on-white bowls from Arroyo Hondo (Habicht-Mauche 1993). The gray paste is fine grained and hard. The paste contains quartz and feldspar grains with clear glass bubble rim and irregular or forked glass flakes, rounded clay pellets of biotite mica, hornblende lathes, and calcium carbonate inclusions. This temper is similar to Type 4 described by Lang (Lang and Scheick 1989:62) for Santa Fe Black-on-white pottery from the Agua Fria Schoolhouse site (LA 2). Lang suggested that the source for the temper or clay was along the east margins of the Pajarito Plateau. The interior is well-smoothed with a light to medium streaky polish. The exterior is well smoothed with a medium polish. The carbon paint design consists of a band of four thin framing lines below the rim. Below the lowest framing line is a motif of right angled, thin, framing lines around a right triangle with pendant dots that alternate with pendant dots on the vertical framing line. The carbon paint has oxidized leaving a gray to light brown ghost.

The three lithic artifacts included two core flakes and one multidirectional core of local chert. One of the core flakes and the core are medium grained and the other core flake is coarse grained. No dorsal cortex was present. Both of the flakes were fragments. The core flakes were 20 and 22 mm long, 12 and 18 mm wide and 6 and 7 mm thick. The multidirectional core was at the low end of medium size, measuring 52 mm long by 47 mm wide by 43 mm thick. The lithic artifacts reflect an expedient core to flake technology. The core was exhausted as evidenced by a lack of suitable platform angles and numerous inclusions that would have prevented successful flake removal.

Area 5 is a sherd and lithic concentration located near Feature 3, a probable thermal feature (Fig. 5). Three of the sherds have moved downslope from Area 1. Two sherds are from a different vessel and provide ambiguous evidence of former function or reason for discard. The two sherds, not from Area 1, may represent a pottery misfire or inherent flaws in the vessel body may have caused the vessel or sherd to break during use. Excavation of the thermal feature and the adjacent area should provide better information on the activity area function as well as a comparative database for LA 86159 thermal features or for thermal features from other Las Campanas sites.

### Conclusions

LA 86159 is a spatially extensive but dispersed sherd and lithic artifact scatter with two sherd and lithic concentrations, one with a partly excavated thermal feature, and a lithic artifact concentration. Archaeological testing within the three concentrations and two other areas revealed shallow cultural deposits. Ceramic manufacture dates indicate occupations that occurred between A.D. 1175 and 1400 (Habicht-Mauche 1993).

Excavation within Area 1 revealed a concentration of Santa Fe Black-on-white pottery associated with a thermal feature of undetermined size and depth. Many of the Santa Fe Black-on-white pottery bowl sherds exhibit an unusual angular breakage pattern that may result from misfiring during manufacture. The spatial association between the sherds and the thermal feature suggest that pottery firing may have occurred on-site. Confirmation of pottery firing at small sites in the Las Campanas would be a major contribution to the archaeology of the Northern Rio Grande and fill a gap in our knowledge of prehistoric Pueblo pottery manufacturing techniques.

A second thermal feature is associated with Santa Fe Black-on-white sherds that have attributes of over-oxidized pottery. These attributes include a ghost of the carbon paint design and spalls that are reminiscent of potlids found on heat-treated lithic artifacts. Size and depth of the thermal feature is unknown but similar to Area 1. Area 5 association between the pottery and the feature suggest compelling interpretations.

A third thermal feature that has fire-cracked rock is located 7 m north of Area 2 in a lithic artifact concentration. The temporal-functional relationship of the feature and artifact concentration were not determined. The fire-cracked rock associated with the hearth is similar to hearths found at late Archaic and Pueblo period sites. The absence of ceramics suggests a late Archaic period occupation or use of the site at a different season.

Areas 1, 2, and 5 appear to have research potential within the framework of the Las Campanas project and the greater Santa Fe Basin. Intrasite and intersite comparisons between thermal feature morphology, content, and spatial structure may provide strong evidence in support of or against the pottery firing interpretations that have been suggested. LA 8615<sup>9</sup> is a small site that may contribute in a large way to a better understanding of how the piedmont hills were used during the Pueblo period.

## SUMMARY AND RECOMMENDATIONS

Archaeological testing of three archaeological sites, LA 84787, LA 84793, and LA 86159 in Estates V, Units 2 and 3, has been completed. Test excavation of these sites reveal important information about the late Archaic, Coalition, and early Classic period use patterns of the Las Campanas area. A summary of the test excavation conclusions and recommendations are provided.

### Summary

LA 84787 is the largest late Archaic-Basketmaker II period site in the Las Campanas project area and consists of five distinct activity areas. Areas 1 through 5 have similar raw material and artifact type distributions. Areas 2 and 5 yielded projectile points of late Archaic styles indicating an occupation that occurred between 1800 and 600 B.C. This long span is probably an overestimate of the actual interval between site occupations given the great similarity between the artifact assemblages. Areas 1 through 5 may be limited base camps. The lithic assemblages reflect a more general range of activities rather than specific activities such as hunting or plant food processing. The projectile point styles are similar to styles assigned to the Cochise and Oshara traditions of the Desert Culture (Sayles 1983; Irwin-Williams 1973; 1979). Lang (1977:306-326) has suggested that during the late Archaic period (after 1800 B.C.) there was an Archaic population intrusion into the Middle Rio Grande from the south. This intrusion is evidenced by the presence of Cochise tradition dart point styles. Moore (pers. comm. 1993) suggests that the differentiation between Oshara and Cochise tradition styles may not be as clear-cut as originally proposed. Area 6 is more similar to raw material procurement sites that were abundant in Estates I and II. Two large pieces of chert and quartzite were reduced for cores or flakes that could be used elsewhere. This reduction pattern has been found in association with Coalition and Classic period pottery types. Area 6 is not contemporaneous with Areas 1 through 5 and did not yield subsurface artifacts. Cultural affiliation of the site occupants is unclear but the repeated use of LA 84787 for logistical hunting and gathering forays has clear data potential for intrasite and intersite studies within the Las Campanas area and interregional comparisons within the Santa Fe area.

LA 84793 is a spatially extensive, dispersed sherd and lithic artifact scatter with two sherd concentrations: a partly excavated thermal feature and a lithic artifact concentration. Archaeological testing within the three concentrations revealed shallow cultural deposits. Ceramic manufacture dates indicate occupations that occurred between A.D. 1175 and 1400 (Habicht-Mauche 1993). Excavation within Area 1 revealed a shallow thermal feature associated with Santa Fe Black-on-white pottery. Many of the Santa Fe Black-on-white pottery bowl sherds exhibit an unusual angular breakage pattern that may result from misfiring during pottery manufacture. The spatial association between the sherds and the thermal feature suggest that pottery firing may have occurred on-site. Confirmation of pottery firing at small sites in the Las Campanas would be a major contribution to the archaeology of the Northern Rio Grande and fill a gap in our knowledge of prehistoric Pueblo pottery manufacturing techniques.

LA 86159 is a spatially extensive but dispersed sherd and lithic artifact scatter with two sherd and lithic concentrations, one with a partly excavated thermal feature and a lithic artifact concentration. Archaeological testing within the three concentrations and two other areas revealed shallow cultural deposits. Ceramic manufacture dates indicate occupations that occurred between A.D. 1175 and 1400 (Habicht-Mauche 1993). Association between thermal features and a unique breakage pattern found on half of the sherds suggests that these areas may have been used for pottery firing. A third thermal feature that has fire-cracked rock is located 7 m north of Area 2 within a lithic artifact concentration. The temporal-functional relationship of the feature and artifact concentration at Area 2 were not determined. The fire-cracked rock associated with the hearth is similar to hearths found at late Archaic and Pueblo period sites.

### Recommendations

Test excavation at LA 84787 indicated that Areas 2, 3, and 4 have the potential to yield equal or greater numbers of artifacts than were observed on the surface. Areas 1 and 5 exhibited a shallower cultural deposit but more functionally diagnostic artifacts. Areas 1 through 4 are expected to have the greatest comparative potential between areas and other sites in the Las Campanas area. Area 6 had a shallow cultural deposit and represented a single event, expedient core reduction episode. No features or temporally diagnostic artifacts were recovered. Area 6 has limited data potential beyond the testing and artifact analysis presented in this report. It is recommended that according to criteria outlined in Santa Fe County Ordinance 1988-8 that LA 84787 has the potential to yield significant information about late Archaic occupation of the Santa Fe area. Therefore a treatment plan is presented in Part II of this report. The treatment plan will focus on the research potential of Areas 1, 2, 3, and 4 since these areas had the highest frequency of subsurface artifacts or the most diverse artifact assemblages.

Test excavation at LA 84793 focused on three artifact concentrations. Two artifact concentrations, Area 2 and 3, yielded few subsurface artifacts and no associated features. These areas are considered to have limited data potential. Area 1 had a Santa Fe Black-on-white pottery concentration associated with a thermal feature that was partly excavated. The evidence for intense heat within the feature combined with a sherd breakage pattern that is similar to pottery found at LA 86159 and at kiln sites in the Mesa Verde region suggest that Area 1 was used for pottery firing. This is an observation that needs further investigation. Evidence for pottery firing in the Middle Rio Grande Valley has not been found or previously reported. It is recommended that according to criteria outlined in Santa Fe County Ordinance 1988-8 that LA 84793 has the potential to yield significant information on Coalition and early Classic period population use of the Las Campanas and Santa Fe areas. Therefore, a treatment plan is presented in Part II of this report. The treatment plan focuses on the research potential of Area 1.

Test excavation at LA 86159 identified Areas 1, 2, and 5 as having potential for increasing our knowledge of local prehistory. Areas 1 and 5 have thermal features associated with Santa Fe Black-on-white pottery. Some of the pottery is broken in a manner that is similar to discarded pottery found in association with kilns in the Mesa Verde region. Area 5 had a relatively high density lithic artifact concentration that is near Feature 2, a cobble-lined hearth. Intrasite and intersite comparisons between thermal feature morphology, content, and spatial

structure may provide strong evidence in support of or against the pottery-firing interpretations that have been suggested. LA 86159 is a small site that may contribute in a large way to a better understanding of how the piedmont hills were used during the Pueblo period. It is recommended that according to criteria outlined in Santa Fe County Ordinance 1988-8 that LA 86159 has the potential to yield significant information about the Coalition to early Classic period use of the Las Campanas and Santa Fe areas. Therefore a treatment plan for the excavation of features and associated activity areas is presented in Part II of this report.



PART II. A TREATMENT PLAN FOR THREE SITES LOCATED IN ESTATES V AND  
ONE SITE IN THE SOUTHWEST PROPERTY CORNER, LA 98690,  
LAS CAMPANAS DE SANTA FE, SANTA FE COUNTY, NEW MEXICO

## INTRODUCTION

Four archaeological sites, including LA 84787, LA 84793, and LA 86159 in Estates V, and LA 98690 in the southwest corner of the property of Las Campanas de Santa Fe, Santa Fe County, have the potential to yield important information about Las Campanas and Santa Fe prehistory. In compliance with Santa Fe County Ordinance 1988-8, a data recovery plan is provided that addresses the data potential of the four sites. Determination of the site data potential is based on the archaeological testing results.

As part of the ongoing research at Las Campanas de Santa Fe, SAC developed a research design for addressing the data potential of the Estates I and II sites (Scheick 1991a). Most of the prehistoric sites were limited activity or hunting and gathering sites. The research design focused on small site variability in artifact assemblages, site formation, structure, and function, and the economic and environmental factors that contributed to site location and function. This variability was to be studied from geographical and chronological perspectives. The underlying theme was that inhabitants of the upper Middle Rio Grande Valley were organized to exploit the resources of the riverine, piedmont, foothill, and montane environments. Through time, subsistence and technological strategies were altered in response to changes in resource availability and distribution, population, and social organization. Exploiting the resources of the different environments required subsistence and technological strategies that should be reflected in archaeological sites. Small-site data were to be used to conduct research at the site, intersite, microregional, and regional scales.

The goals of this data recovery plan will be less comprehensive than previously proposed for the SAC data recovery effort. This is because the site sample is small and the SAC data recovery efforts are, to date, unpublished, except for rough draft descriptive preliminary reports. These two factors render synthetic interpretations based on the OAS data recovery effort premature and potentially spurious. Instead, the OAS data recovery effort will choose research questions that can be dealt with using more site-specific data. Intersite comparisons and interpretations on a regional level will be offered as is appropriate given the data that are recovered.

This data recovery plan will be divided into research questions, data needs, and specific field and laboratory methods for each site. General excavation and laboratory methods will be provided for all sites. The excavation and analysis methods will not necessarily follow the SAC plan, but the data should be comparable to the SAC results. The sites will be presented in chronological order.

### Research Questions

Previous late Archaic-Basketmaker II period research in the Santa Fe area has focused on site-specific and regional problems. The Cochiti Reservoir and Dam study examined relationships between site locations and vegetative diversity, site size and artifact density, group size and feature frequency, and subsistence remains and seasonality (Chapman and Biella 1979:385-393). The Airport Road site (LA 61282) study focused on problems of population increase through immigration or indigenous growth, comparisons between logistical and residential sites using artifact assemblages and site structure, regional Archaic settlement patterns as reflected by nonlocal materials, the relationship between artifact assemblage and site function, and interregional differences in site structure and artifact assemblage reflecting use of different environments (Lent 1988:17-18).

The Las Campanas research design (Scheick 1991a:26-27) focuses on land-use patterns on the piedmont slope including temporal variability, site function and placement, and changes in regional socioeconomic organization. Within these broad issues are more site-oriented problems of occupation history, subsistence activities, site variability, and lithic raw material procurement and reduction. Problems of a more projectwide scope include determining and reconstructing settlement and subsistence strategies on the piedmont slopes and their role within regional adaptations.

These problem domains can be addressed at site, local, regional, and interregional scales. Archaeological investigation is conditioned by the number of sites, the availability of absolute dates, the artifact assemblage, structure of the sites, and the integrity and preservation of the archaeological deposit. Understanding site function and role in a local and regional system depends heavily on preservation of plant and animal remains. Estimates of and inferences about group size and composition rely on analyses of artifact and feature assemblages that draw extensively on ethnographic analogy and ethnoarchaeological observation and replication studies. Las Campanas late Archaic-Basketmaker II period sites have yielded limited direct subsistence evidence and fine-grained temporal data for the study of settlement patterns and subsistence strategies within a changing environment.

Relying on the Las Campanas research design (Scheick 1991b) for guidance, data recovery at LA 84787 can be used to address problems that focus on chronology, occupation history, and subsistence and mobility. Analysis of variability in site structure and function and lithic raw material procurement and reduction strategies will be integrated into the study. LA 84787 will be the fourth excavated Archaic period site in the Las Campanas area. Chronology and occupation history will be addressed on the intrasite level. Subsistence and mobility will be addressed at intrasite, intersite within Las Campanas, and intersite levels for the Santa Fe area.

#### *Chronology*

When was the site occupied and what kind of occupation periodicity is indicated? LA 84787 has

five discrete lithic artifact concentrations that may evidence at least five occupation episodes during the late Archaic and Basketmaker II periods. Lang (1977:342) observed changes in late Archaic-Basketmaker II assemblage composition and site location in the San Cristobal Ranch, New Mexico, area. These changes may have reflected differences in group composition and size, and hunting and gathering strategies. He suggests these changes may have corresponded with variable temperature and moisture regimes between 380 B.C. and A.D. 400. Cooler temperatures are suggested for the periods between 400 and 300 B.C. and A.D. 300 and 400 with a generally warmer climate prevailing between 300 B.C. and A.D. 300 (Lang 1977:328). Periods of moisture availability similar to modern patterns occurred between A.D. 275 and 300 and A.D. 375 and 400. Periods of subnormal moisture occurred between 380 and 40 B.C. and A.D. 200 to 275. Above average periods of moisture occurred between 40 B.C. and A.D. 200 and A.D. 300 and 375 (Lang 1977:328). These climatic data are summarized in relative terms and do not inform directly on the year-to-year resource abundance and distribution. They do suggest that variable conditions did exist that could have affected site location, occupation duration, and the range of activities performed.

Excavation of Areas 1 through 4 at LA 84787 will focus on collecting chronometric samples and temporally diagnostic artifacts. It is expected that date ranges obtained from chronometric and relative dating will be more than 100 years (plus or minus 50 years). The date ranges may still provide an indication of the general climatic regime under which the occupation occurred. Combined with artifact assemblage analysis, these data can be used to address how variability in subsistence resource structure may have influenced occupation duration and periodicity.

**Data Needs.** To address questions of chronology and periodicity, date ranges of 100 years or less would be optimal. Samples that can be used for dendrochronological, C-14, archaeomagnetic, and obsidian hydration dating would be collected. Each dating technique has methodological and contextual limitations. The reader is referred to Smiley (1985), Blinman (1990), and Schiffer (1987) for discussion of problems, solutions, and advantages.

Change in projectile point style through time provides a coarse-grained indication of occupation interval. San Augustin, San Pedro, and En Medio style projectile points recovered from the site suggest that there may be long intervals between occupations. If noncontemporaneous temporally diagnostic projectile point styles are discretely distributed among Areas 1 through 4, then this may be an indication of long intervals between occupation. If noncontemporaneous temporally diagnostic projectile point styles are intermixed, but there is no evidence of multiple occupation of a loci, then scavenging or recycling of projectile points between loci may have occurred. If the latter distribution occurs, but there is evidence of multiple occupation of a loci, then long intervals between occupations may still be indicated. Recovered projectile points will be compared with regional collections that are associated with absolute dates in an attempt to refine the date range for each type.

### *Occupation History*

What is the occupation history of the site or how many occupations are represented in Areas 1 through 4? Determining the number of occupations represented by each artifact concentration is critical to chronological and functional studies at the intrasite level. Different spatial patterns of

activity and discard areas may reflect duration of occupation and group size and composition. Short-term diurnal occupation or special activity sites, limited base camps, and residential base camps should have had distinct site structure (Binford 1983b; Vierra 1980; Stiger 1986; Camilli 1979). Recognizing these distribution patterns is important for determining activity area and site occupation sequence.

Short-term occupation with a restricted activity focus may result in an unpatterned association between features, activity areas, and discard areas (Binford 1983b; Vierra 1980). Limited base camps may have had a wider range of activities and longer occupation duration. These sites may have a patterned distribution such as were defined for many of the Cochiti Dam lithic artifact scatters with features and fire-cracked rock concentrations (Chapman and Biella 1979; Camilli 1979). Residential base camps that were occupied for weeks or months during a season should have a combination of artifact assemblage diversity, formal feature construction, and accumulated discard areas. In situations where these kinds of occupation patterns are single episode, they should be recognizable.

In situations where a site has multiple occupations, mixing occurs with the longer duration occupation masking the shorter duration, more ephemeral occupation. The mixing of a residential base camp occupation with shorter duration occupations, masks the shorter occupations and increases the intra-assemblage variability and spatial distribution noise (Vierra 1980; Camilli 1979, 1989). Residential occupation should still be recognizable under these conditions. The same general observation should hold true for mixed limited base camp and special activity assemblages and distributions. Special activity occupations that spatially overlap may not be distinguishable. Monitoring the distribution of large reduction debris or discarded hand or grinding tools may provide some indication of occupation sequence. Overlapping special activity occupations may form high density artifact deposits that look like an accumulation from a longer occupation.

**Data Needs.** The study of site and activity area occupation history and formation will use patterns of artifact density and artifact type distribution to map occupation episodes. Data needs for this study are straightforward. The activity areas must be excavated and the artifacts collected in a way that density plots and distribution maps may be generated. Excavation will focus on contiguous blocks rather than transects across the activity areas to allow spatial analysis. The most cost effective and timely method is a 1-by-1-m grid system for collection and excavation. It is not expected that stratified deposits will be encountered, so comparability of excavation levels within each activity area will be maintained. Large artifacts such as manos, metates, or concentrations of fire-cracked rock will be mapped in place and numbered. The piece-plotting of these items will aid in identifying activity and discard areas.

### *Subsistence*

What activities were conducted on site and are there differences within the occupation sequence? Does the subsistence data reflect proposed models of hunter-gatherer mobility? Subsistence can be directly inferred from dietary evidence and indirectly investigated by studying the technology used to procure and process foods. Dietary evidence includes faunal and floral remains. Technological evidence is inferred from the study of chipped and ground stone manufacture and use. Dietary evidence may be collected, but the prospects are low. Technological evidence should be abundant in the form of the chipped and ground stone. Lithic technology and activity area

organization should provide indications of the late Archaic mobility pattern.

Site types and distribution should reflect subsistence strategy. Forager and collector hunting and gathering models are used to organize site types and explain their distribution across a landscape (Binford 1983c; Elyea and Hogan 1983; Fuller 1989). Foragers are characterized as residentially mobile and collectors are logistically mobile. Both models use a functional site typology that includes a residential base camp, limited base camp, special activity sites, and resource extraction sites. Usually, Archaic period hunter-gatherers are described as being flexible with the subsistence strategy varying according to season and resource distribution. In other words, environmental conditions determined the foraging and collecting strategies employed. In the upper Middle Rio Grande, use of the forager-collector models are limited by a lack of data from large contiguous areas and an absence of a synthesis of existing data from a forager-collector perspective. LA 84787 can be examined from the perspective of forager-collector models, although the strength of the conclusions may be affected by a small site database and the limited number of absolute dates.

The late Archaic-Basketmaker II subsistence pattern included a broad spectrum of edible plants and small and medium-size mammals. The abundance and distribution of food resources combined with access to critical non-food resources probably strongly influenced location of residential sites, length of occupation, and the type of strategy that was used to obtain and process resources.

Different hunting and gathering strategies may be reflected in the artifact assemblage (Binford 1983b; Kelly 1988; Parry and Christenson 1987; Moore 1989). If abundant plant resources were available, then tool production and use would have focused on gathering and processing. Presumably, a lithic artifact assemblage that is mostly geared to plant gathering and processing would have more expedient or generalized tools and fewer tools and manufacturing debris associated with hunting. Conversely, if plant gathering could not fulfill subsistence needs and hunting was more important, artifact assemblages and features should reflect hunting and deemphasize plant gathering and processing. Residential occupations that occurred from the late spring to the early fall when plant and animal resources were available should have assemblages that reflect mixed activities. Late fall to early spring occupations occur when plant foods are less abundant to nonexistent, therefore an increased reliance on game mammals should be reflected in the artifact assemblage. LA 84787 may have an artifact assemblage that can be studied from the perspective of generalized versus specialized technology.

**Data Needs.** Subsistence and changes in subsistence strategy can be addressed using floral and faunal remains, features, the artifact assemblage, and the spatial relationships of the data. Floral and faunal remains are unlikely to be abundant at the site. The site is on a ridge top and may have a shallow cultural deposit. Floral and faunal remains do not preserve well in open-air contexts, therefore any floral or faunal remains may reflect a very small part of what was actually used. Lithic artifacts are often the only material culture evidence remaining at open-air pre-Pueblo period sites, and they appear to be abundant at LA 84787.

Contexts where floral and faunal remains may be present are hearths, storage pits, and deep midden deposits. Deep midden deposits are unlikely at LA 84787 because it is a ridge top site with a very slow rate of soil formation or deposition. A midden deposit is more apt to be spread out then buried and preserved. Floor contact would be from within a pit structure. If

storage pits are present, then pollen samples can be collected from the pit floors. Hearths, the most likely feature to be found at LA 84787, have the best potential to yield macrobotanical remains. At least 3 liters of fill from hearths will be collected for processing and analysis in an effort to obtain macrobotanical specimens. Hearths also may yield fragmentary faunal remains. Collecting a large sample of the hearth fill will increase the chance that faunal remains will be recovered.

Chipped stone as an indicator of subsistence activities relies heavily on technological trajectories for core reduction, tool production, use, and maintenance. As mobile hunter-gatherers, Basketmaker II groups may have employed situation-dependent lithic technologies. Distance from residential sites and the source of suitable material for production of tools needed for anticipated tasks have been suggested as conditioners of stone tool technology (Kelly 1988; Binford 1983b). Models proposed by Binford (1983b) and Kelly (1988) will be used to evaluate the LA 84787 assemblage. The chipped stone assemblage will be examined in terms of reduction strategy, assemblage diversity, tool use, and maintenance. These data should reflect the on-site subsistence activities and the position of the site within a larger system.

The presence of ground stone, such as manos and metates, can be used to infer processing activities. Metates, which are large, nonportable items, would be expected at residential sites or temporary base camps that were used for more than a day. Metates at temporary base camps might indicate caching in anticipation of future visits (Binford 1983c). Manos are smaller and more portable and may have been discarded at temporary base camps or limited activity sites. In an area where cobbles are abundant, a mano would not be an indispensable piece of personal gear (Binford 1983b). Thus, manos are indicators of food processing, but they may not be indicators of the duration or the intent to reoccupy a site.

Lancaster (1983) has suggested that different manos and metates provide optimal grinding for certain types of seeds or grains. Manos and metates from LA 84787 can be examined from the perspective of functional differentiation. Use of manos for food processing, storage, or immediate consumption may be examined using Lancaster's assumptions.

Features, such as hearths, structures, or storage pits will provide more direct evidence of site function. The suggested hunter-gatherer site typology is hierarchical, in that as length of occupation decreases, so does the site structure complexity in terms of the diversity and repetition of activities, features, and artifacts. A residential structure, in association with storage features, would be strong evidence of residential occupation. Hearths may have been used at temporary base camps and limited activity sites. Sites without features would have been limited activity sites or resource extraction locales.

The presence of features and their association with artifacts will strongly influence the ability to determine site function. These associations are the basis for site structure analysis. Site structure analysis methods are used to address site formation, activity areas, and group size, for example. For LA 84787, artifact associations and distribution in relation to features will be used to address site formation and length of occupation.

LA 84793, LA 86159, AND LA 98690:  
EXTENDED RANGE RESOURCE PROCESSING, PROCUREMENT, AND  
MANUFACTURING SITES

LA 84793, LA 86159, and LA 98690 are Coalition to early Classic period sites in the Las Campanas area (A.D. 1175 to 1425). These sites have ceramic concentrations associated with thermal features and dispersed artifact scatters. Each site was occupied at least three times as indicated by the number of artifact concentrations. Distance from the Santa Fe River villages to these sites ranges from 6.1 to 7.2 km, which is beyond 5 km mean distance for diurnal mean daily foraging suggested by ethnographic data (Arnold 1985). The 5 km mean represents linear distance and does not fully account for pheric factors or social factors that may influence an actual diurnal foraging radius. Similarity in artifact and feature associations and overall site structure suggest similar functions for these sites.

A primary focus of the Las Campanas archaeological investigations has been to document and reconstruct land-use patterns as they are reflected by the types and distribution of archaeological remains. Land-use patterns may reflect changes in local demography, climate, and environment. Environmental change may result from climatic or human effects. Climatic variables are always independent of the effects of human behavior. Human behavior is often conditioned by climatic conditions, which, when acting in concert may adversely affect the immediate environment of a village or community. Change in the immediate environment, such as a reduction in soil arability, surface water availability, or depletion of animal populations and plant communities may have caused changes in resource procurement and processing and manufacturing strategies.

The typical pattern in the Las Campanas archaeological record is abundant isolated artifacts and small sites. These remains reflect a wide ranging and broad-based diurnal foraging strategy. Diurnal foraging by nongender-specific individuals or groups would have occurred during all seasons. Ideally, foraging or field strategies would have maximized the return in gathered, processed, or manufactured resources at the minimum possible cost (Jarman 1972; Arnold 1985). Accumulation or production of the most resources for the least effort would have been conditioned by resource abundance and distribution and constraints imposed by land tenure and competition for resources (Arnold 1985). The latter constraints on land use may have been increased as the population along the Santa Fe River grew. Constraints on use of resources in "commonly held" lands outside the immediate area of the Santa Fe River villages may have resulted in an extension of the diurnal foraging range. Specialized thermal features, reoccupied sites, and longer duration occupations may have resulted from extension of the diurnal foraging range.

Research questions and data needs are proposed that can be applied to all three sites. Data recovery and analytical methods specific to each site will be provided in the Field and Laboratory Methods section. LA 84793 and LA 85159 have been described in this report. A brief description of LA 98690 precedes the Research Questions.



## LA 98690, Site Description

LA 98690 is on a gentle southwest-facing slope above the head of a large and well-entrenched unnamed arroyo. The site is in an area that is cut by numerous shallow erosion channels. The ground cover is very sparse and the site surface is obviously deflated. The vegetation is piñon-juniper woodland with clumps of blue and sideoats grama grass, rabbitbrush, snakeweed, and yucca. The soils are fine loose clay sand mixed with gravel and cobbles.

LA 98690 is a series of small artifact concentrations scattered across an area of 16,000 sq m or 1.5 ha (4 acres) (Fig. 6). There are nine sherd concentrations, a fire-cracked rock concentration, a Pueblo side-notched obsidian projectile point fragment, and a mano. The artifact count for the site ranges between 200 and 300. The sherds are all Santa Fe Black-on-white, dating the site to the Coalition or early Classic period (A.D. 1175 to 1425). The sherds tend to be scattered along erosional channels indicating some artifact movement from erosion.

Camilli (1989) suggests that reoccupied sites are larger and have lower artifact density than sites that are reused. Reoccupation means the return to the same area. Reuse means return to the same place with reuse of features and perhaps artifacts. Reuse also may include caching of site furniture, which includes nonportable gear such as ground stone or large ceramic vessels. From the perspective of reuse or reoccupation it appears that LA 98690 was reoccupied by groups that were not necessarily related, but mainly from the Santa Fe and Tesuque River Basin.

The diversity of lithic artifacts and the presence of a roasting pit suggest that both hunting and gathering were supported by site activities. With a roasting pit, discarded tools, and tool production, LA 98690 resembles a base camp, and not a limited activity site. It is possible that LA 98690 was used for extended foraging expeditions from the Coalition period villages of the Santa Fe and Tesuque River valleys.

## Research Questions

### *What Was the Site Function?*

Each site has as at least one thermal feature with a ceramic concentration and evidence of three or more occupations. Test excavation of LA 86159 and LA 84793 recovered sherds with a distinctive fracture pattern that were associated with a thermal feature. It is hypothesized that the association of the sherds and features may indicate a former pottery-firing location. The same sherd breakage pattern in association with a thermal feature was not observed at LA 98690 during the archaeological survey. Closer examination of LA 98690 during data recovery may reveal a similar or different pattern that can be compared with LA 84793, LA 86159, and LA 86150 (which was excavated during the Estates IV data recovery effort).

Artifact concentrations that are not associated with thermal features will be excavated at LA 86159 and LA 98690. Excavation of these areas will provide information about the site

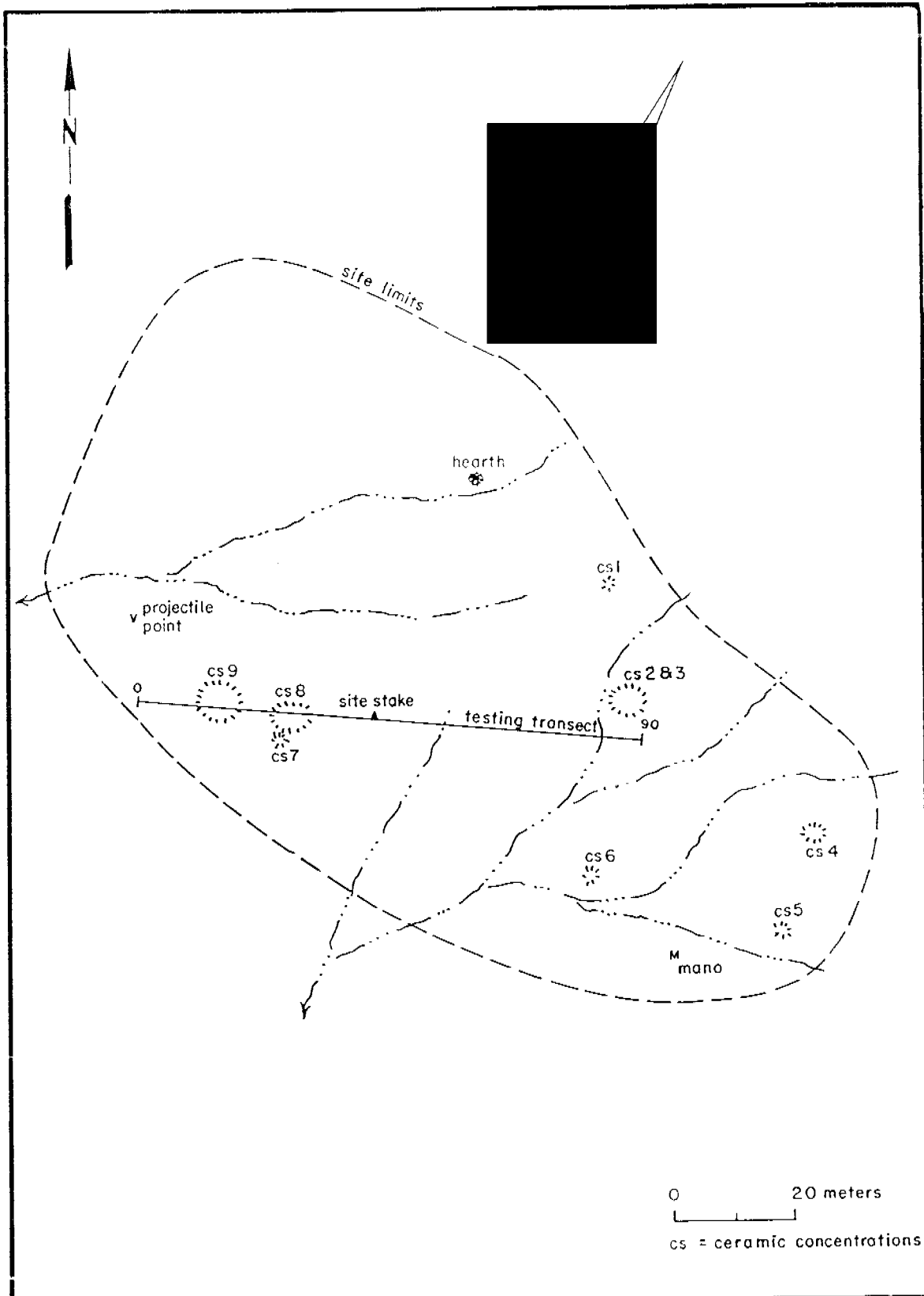


Figure 6. LA 98690, site map.

occupation sequence and the range of site activities. If possible, temporal relationships of artifact concentrations and features will be established. Contemporaneous, but different, activity areas may reflect a multifocus foraging and production strategy. Multifocus strategies may have occurred as distance between the village and the resources increased. Multifocus strategies may have been a means of increasing resource harvest or yield in order to off-set energy losses caused by a longer distance foraging radius.

**Data Needs.** The site function study will be divided into field data collection and analytical and replication studies. The field data collection will focus on revealing internal structure and morphology of thermal features, spatial relationships between the thermal features and artifacts, and spatial/temporal relationships between activity areas. Careful excavation and plotting of artifacts and fire-cracked rock within the area surrounding the thermal feature should reveal activity area organization that can be compared with excavated kilns from the Mesa Verde area. Excavation of nonthermal feature areas in 1-by-1-m units will provide artifact distribution data that can be compared at equivalent levels with nonpottery-firing activity areas within and across the sites.

The analytical studies will consist of comparison between morphology, construction, and internal structure of the excavated pottery-firing features, pottery-firing features and nonpottery-firing features, and between nonpottery-firing features and activity areas in the Las Campanas and Santa Fe areas. Possible pottery-firing feature attributes will be compared with pottery kilns identified in the Mesa Verde region (Purcell 1993). Results of the comparative study should provide baseline data for making functional determinations for Las Campanas thermal features. The potsherds collected from the thermal feature activity area will be classified according to technological attributes that reflect firing success or failure. The distinctive breakage pattern will be described in greater detail than is provided in this report. All sherds collected from the sites will be classified in this manner for comparison between discarded "firing failures" and discarded partial vessels that may have been used as tools or temporary containers.

Lithic artifact assemblages will provide comparative data that may reflect differences in stone use and manufacture relating to requirements of pottery firing and foraging activities. Lithic artifact assemblage analysis will focus on tool production and use. Lithic artifact data will be compared with the large body of Las Campanas lithic data for functional and temporal differences. These differences may relate to multifocus occupations or temporally and functionally unrelated occupations.

The replication portion of the study will be designed to provide tests of the pottery firing model of feature function derived from the analytic studies. This portion will include comparative data on clay and temper suitability for pottery construction, tests of feature suitability for achieving necessary firing temperatures and atmospheres, and experimental breakage studies to assess firing errors or usage patterns can account for the characteristics of the archaeological materials. Clay samples from the Santa Fe River Valley and the Las Campanas areas will be collected and subjected to a standard series of workability measures (stickiness, plasticity, and shrinkage). Samples will be subjected to controlled oxidation (refiring) and petrographic analyses to assess similarities or differences with parallel studies of sherds from the archaeological features. A feature replica will be built, and test firings will be conducted using firing regimens designed with the help of stratigraphic observations from the excavations and the results of other Anasazi pottery firing experiments (Brisbin and Swink 1993; Toll et al. 1991). The test firing will

include vessel replicas and test tiles made with vetted examples of local raw materials. Color and vitrification will be used to assess the quality of firing, and post-firing stratigraphy will be recorded for comparison with that of the archaeological features. Moisture content of the vessels and firing rates will be varied to cause firing breakages. Sherd fracture morphologies induced by these factors will be compared with the results of other breakage models (such as the cumulative heat shock of cooking and simple impact) and with the morphologies of the archaeological sherds.

Temporal data will be needed to address the issue of single or multiple temporal components. Sherds of temporally diagnostic pottery types have been and will be collected from all sites. Analysis will focus on stylistic and technological attributes that may have temporal significance. Excavation of thermal features may yield charcoal that can be used for Carbon-14 dating. Charcoal will be collected and assessed in terms of its potential to yield reliable dates with a low standard error. Soil in the Las Campanas area appears to have very low iron content as evidenced by the lack of archaeomagnetic samples that have been collected for sites with thermal feature. Thermal features will be assessed for archaeomagnetic sample collection. Large pieces of wood charcoal will be examined for outer bark or sufficient ring counts for dendrochronological analysis.

Thermal feature function will be assessed using ethnobotanical analysis. Large soil samples (greater than 3 liters) will be collected from each feature. All samples will be scanned for their potential to yield charred economic plant species and wood identification. Large size sample collection is a strategy that should ensure that even small amounts of charred economic plant and animal remains will be recovered.

*Do these sites represent a foraging strategy that is different from the short duration, expedient, diurnal foraging strategy indicated by the site and isolated occurrence distribution found along the Arroyo de los Frijoles?*

LA 84793, LA 86159, and LA 98690 are between 6.1 and 7.2 km from the Pindi Pueblo and Agua Fria Schoolhouse, which are the largest and westernmost components of the Santa Fe River villages. These sites and a number of other small Coalition period to early Classic period sites appear to represent the extension of a diurnal foraging strategy beyond the one-hour travel radius suggested by ethnographic data (Arnold 1985). Investigators recognize that actual foraging radius is affected by demographic and environmental factors. Two key conditioners may have been the size of the population dependent on the resources and the effects of long-term exploitation on a resource area, which would have affected the annual abundance and distribution of the resources. If the density and ubiquity of cultural materials is a measure of intensity of resource exploitation, then the areas along the Arroyo Frijoles in the east part of the Las Campanas area were the most heavily exploited by the Santa Fe River villagers. As distance from the Santa Fe Villages increased, the number of sites and isolated artifacts decrease. However, it appears that there was a trend toward reoccupation of more distant sites, as if specific resource areas were targeted and staging sites were established.

**Data Needs.** Excavation of LA 84793, LA 86159, and LA 98690 may yield artifact assemblage and feature function patterns that are different from sites located closer to the Santa Fe River villages. Data from other excavated sites in the 6 to 7 km range can be compared with the Estates V sample to determine if recognized patterns apply to a larger sample. Data that are collected for

the site function study will be used for comparison with other Las Campanas area sites. These data include feature function data, technological and functional data from lithic artifact analysis, and spatial data showing artifact type and frequency distributions and artifact and feature associations.

## FIELD AND LABORATORY METHODS

### Field Methods

Field methods will be slightly different for each site, but will follow the same general order from reexamination of the sites to final transit mapping. This section will provide a general outline of the field methods with site-specific methods included as necessary.

1. Each site surface will be reexamined and the concentrations, artifact scatters, features, and site limits will be pinflagged. At LA 84787, Areas 1 through 4 will be reexamined and pinflagged to define the actual extent of the artifact concentrations. LA 84793, Area 1, and LA 86159, Areas 1, 2, and 5, will be intensively reexamined and the artifacts pinflagged and the large fragments of fire-cracked rock marked for mapping. LA 98690 will be reexamined as a whole and the artifacts pinflagged to define artifact clusters and feature locations.

2. A 1-by-1-m grid system will be superimposed across each site and the limits of the activity areas or artifact concentrations will be staked. Each 1-by-1-m collection unit will have a north and east designation. The signature corner will be the northeast corner. All artifacts within collection grids will be placed in bags with the grid designation.

3. Surface artifacts within the excavation areas will be collected in 1-by-1-m units. At LA 84793, LA 86159, and LA 98690, large sherds associated with thermal features (greater than 5 cm maximum dimension) will be piece-plotted within a 1-by-1-m grid, assigned a consecutive number, bagged, and placed within the bag containing all artifacts from the grid. At LA 84787, cores, hammerstones, projectile points, bifaces, and tools will be piece-plotted within each grid, assigned a consecutive number, and placed within the bag containing the bulk collections from the grid. Lithic debitage will be collected in bulk by grid.

Temporally diagnostic artifacts located outside excavation areas will be piece-plotted. Piece-plotted artifacts will be assigned consecutive numbers and will be integrated into the grid system in the lab using a computer mapping program. Artifacts outside the excavation areas will be field recorded using the laboratory analysis formats.

4. Excavation of activity areas and artifact concentrations at the four sites will emphasize data collection from contiguous units to support site structure analysis. The excavation methods will include a combination of surface stripping and subsurface grid excavation.

Depending on the size of the artifact concentration at LA 84787, an area covering from 100 to 200 sq m will be surface stripped by hand. Location of the excavation area will coincide with the area of highest artifact density. Artifact density from each unit will be monitored. Grids with the highest numbers of artifacts will be further excavated in 1-by-1-m grids until at least 10 percent of the grids have been excavated into nonartifact-bearing strata. In Areas 1, 3, and 4, excavated depth should not exceed 15 cm deep based on the test excavation results. In Area 2, excavated depth should not exceed 25 cm. The 10 percent sample will be selected from the grids with the highest artifact counts.

No surface indications of features were identified at LA 84787. Features will be considered indicators of an occupation level. If a feature is found in a 1-by-1-m excavation unit below the surface strip, then a 2-by-2-m area around the feature will be excavated to the top of the feature until the feature outline is exposed. Temporally and functionally diagnostic artifacts associated with the feature will be piece-plotted. Up to 16 sq m will be exposed around the feature to define the structure and content of the activity space immediately surrounding the feature. Considerations of time and cost will be weighed to determine how much of the feature excavation area should be counted against the overall 10 percent excavation sample. If time allows, the excavation sample may be increased another 10 percent to provide a more representative sample of the artifact concentration.

At LA 86159, Area 2, excavation will concentrate on high density artifact area. A 8-by-8-m area covering 64 sq m will be surface stripped. A 10 percent sample of the highest density units will be excavated to a 15 to 20 cm depth, which is the nonartifact-bearing level determined by testing.

At LA 98690, concentrating on artifact clusters may result in the excavation of eight to ten activity areas. Each area will be surface stripped between 16 and 64 sq m depending on the size of the artifact concentration. One to four units will be excavated to a nonartifact-bearing level within each concentration. If these units yield no artifacts or lower artifact counts than were found on the surface and in the surface strip, then no further excavation will be conducted. If these units yield equal or higher artifact counts than were found on the surface and in the surface strip, then 10 percent of the area will be excavated to the nonartifact-bearing level.

LA 84793, Area 1, and LA 86150, Areas 1 and 5, will be excavated in 1-by-1-m units covering an 8-by-8-m area. The 16 sq m surrounding the thermal features will be surface stripped with a trowel. The remaining 48 sq m will be carefully surface stripped by shovel. Large pieces of fire-cracked rock or burned cobbles, sherds, and lithic artifacts will be piece-plotted. Artifacts will be assigned a consecutive number, and bagged with the bulk collections from each unit. Piece-plotting of large artifacts will allow approximate reconstruction of the activity area structure.

5. Activity area excavation will be by hand, using standard archaeological hand tools. All fill will be screened, with the mesh size determined by the excavation context. Screen mesh no larger than ¼-inch will be used. All 1-by-1-m excavation units will be excavated in 10-cm levels. If a cultural stratum is encountered, it will become the excavation unit. Within these strata, 10-cm excavation levels will be used to provide finer control of artifact locations. The 10-cm levels will allow comparisons between excavation units using density and volume measures.

As excavation proceeds, diagnostic and large artifacts or potential structural components of features will be mapped using the closest set point. Mapping of large artifacts or disarticulated feature components will aid in the identification of occupation levels or surfaces. Excavation will continue until noncultural material-bearing soils are encountered.

Excavation documentation will consist of field notes and grid forms compiled by the excavator. The forms will contain locational, dimensional, stratigraphic, and contextual information. General notes outlining excavation strategy and rationale, field interpretations, and decisions will be kept by the project director and site assistants.

6. Feature excavation will proceed by exposing the top of the feature and the area immediately surrounding it. The stain or soil change will be mapped and photographed (if appropriate). The feature will be excavated in cross section in 5-cm levels, exposing the natural stratigraphy. Exposed artifacts or components will be located as described above. Artifacts that are found in each level will be bagged separately and added to the artifacts recovered by water screening. The exposed cross section will be profiled and the soil levels described using a Munsell Color Chart and standard geomorphological terms. The second half of the feature will be excavated in natural levels or 5-cm arbitrary levels. At least 3 liters of soil will be collected from each 5 cm level or natural level for water-screening and ethnobotanical analysis.

Once the feature is completely excavated, feature maps and profiles will be drawn and tied into the grid system and site elevations. Drawings will include a scale, north arrow, and key to abbreviations and symbols. Written description will be on standard forms that will include provenience, dimensions, soil matrix, artifact, construction, time frame, excavation technique, and other data. Photographs will record the feature excavation progress and the final excavated form. Photographs will include a metric scale, north arrow, and mug board with the LA, feature number, and date. All photographs will be recorded on a photo data sheet.

Artifacts recovered from each provenience will be bagged and labeled by unit, stratigraphic or arbitrary level, date, and excavator's name. A specimen number will be assigned to all bags by provenience and a field artifact catalogue maintained for each site. Materials necessary for immediate preservation of fragmentary and unstable faunal and ethnobotanical remains will be used. Large lithic artifacts will be bagged separately to minimize bag wear. Very small flakes and angular debris will be placed in vials or bags within the artifact bag so they are not lost during cleaning.

7. C-14 samples will be collected from features and other possible cultural contexts. Samples will be ranked according to their context and data potential. Preferred samples should lack sources of potential contamination from burrows and nests, prolonged exposure during excavation, and proximity to modern surfaces or disturbance. First priority samples will be taken from lower strata and feature floors and interiors. Second priority samples will come from upper feature fill or proveniences that exhibit limited evidence of disturbance. If first and second priority sample proveniences are absent, the third priority samples from disturbed or less intact contexts will be collected.

After the hearths, roasting pits, or other pit features are cross-sectioned, the sample potential will be assessed. If deep features are encountered, then pollen samples may be collected separately from the soil that will be water screened. For pollen samples, 2 tbsp of soil will be collected from the best strata. The samples will be put into plastic bags that have been kept sealed. If burned seeds or wood are encountered, up to 20 g will be collected for radiocarbon analysis. All samples will be collected with a dry, clean, trowel or tweezers and placed immediately into a bag or tin foil. Carbon samples will only be collected from first- and second-priority contexts, unless third-priority contexts are all that are available. Archaeomagnetic samples will be collected according to the processing laboratory's standards.

Sample locations will be plotted on plan and profile drawings of features and proveniences. The sample bags will be labeled with the provenience designation, feature number, location within the feature, and stratigraphic position. The samples will also be recorded on



specimen forms with labeling information, environmental data, contextual information, and any other comments that may be useful to the laboratory analyst.

8. An updated transit map of the site will be made. The map will include feature and artifact locations, excavation areas, and relevant topographic features.

### Laboratory Methods

Before artifact analysis, all recovered materials will be cleaned, and any materials requiring conservation will be treated. Collected samples of charcoal and ethnobotanical remains will be processed and prepared for shipment to the appropriate laboratory. The specialists will be consulted for special preparations required before shipment. Working copies of field maps and feature drawings will be prepared and made available to the special analysts.

The lithic artifact analysis will follow the guidelines of the Office of Archaeological Studies Lithic Artifact Analysis Manual. The lithic analysis is particularly suited to monitoring technological organization. Morphological and functional attributes emphasize reduction stage, manufacture and maintenance, and tool use and discard. These are the main foci of the research orientation and implementation.

The ceramics will be identified according to existing regional typologies for the Middle and Northern Rio Grande. Sources of information may include Stubbs and Stallings (1953), Lang and Scheick (1989), Mera (1935), and Chapman and Enloe (1977). The primary foci of the ceramic analysis will be dating, function, use-life, and source of manufacture.

Faunal remains will be analyzed in the OAS Laboratory by Linda Mick-O'Hara. Depending on the size, condition, and preservation of the specimens, they will be monitored for species, sex, age, portion, condition, evidence of butchering, and evidence of taphonomic processes. Faunal remains are important indicators of subsistence strategy and site formation. The detail of the analysis will be tempered by the abundance and condition of the faunal remains.

Upon completion of the attribute identification, the coded data will be entered into a DBase III or Statistical Package for the Social Sciences (SPSS) data entry program. Statistical manipulation of the data base will be performed using SPSS PC + Version 3. Statistical tests will be geared towards examining patterns in artifact distribution that reflect technological organization. Tests and analytical techniques that may be used include Chi-square tests for independence, correspondence, and cluster analysis to identify similar assemblages within the Las Campanas area. Results of the tests will be illustrated with graphs, tables, charts, and distribution maps. The computerized data base may be used to generate a project artifact catalogue. Artifacts with attributes important to analysis and site interpretation will be illustrated for the report.

Laboratory analysis of collected pollen samples will be conducted by a professionally recognized independent consultant. The flotation and macrobotanical remains will be analyzed at the Office of Archaeological Studies by the staff ethnobotanist, Mollie S. Toll. The analyses will identify plant resources that were used prehistorically.

Carbon-14 dating will be conducted by Beta Analytic, Inc., of Coral Gables, Florida. Archaeomagnetic analysis will be conducted by Dr. Daniel Wolfman, on staff at the Office of Archaeological Studies. The purpose of these analyses will be to obtain the most accurate range of dates possible for cultural strata and features.

The proposed replication study will be conducted by members of the OAS staff who have expertise in pottery manufacture and firing studies. Petrographic analysis will be subcontracted to a professional with experience in characterization of northern Rio Grande prehistoric ceramic pastes.

### Research Results

The final report will be published in the Office of Archaeological Studies' *Archaeology Notes* series. The report will present all important excavation, analysis, and interpretive results. Included will be photographs, maps, and tables. Raw data such as field notes, maps, photographs, and artifact catalogues will be given to the State Historic Preservation Division, Archeological Records Management Section, currently located in the Laboratory of Anthropology in Santa Fe. The artifact collection will be curated in the Museum of New Mexico's Archaeological Research Collections or a facility of Las Campanas's choice.

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## APPENDIX 2

### General Excavation Methods for Testing of Estates V Sites

The following are the general field methods that will be used at each site:

1. Each site surface will be reexamined and the artifact concentrations, artifact scatters, features, and site limits will be pinflagged.
2. A base line will be established that transects the artifact concentrations or excavation area at each site. A 2-by-2 m grid system will be superimposed across the artifact concentrations. The 2-by-2 m excavation unit within each concentration will be placed within the grid system.
3. Excavation will be by hand, using standard archaeological hand tools. All fill will be screened through ¼-inch mesh. The 1-by-1-m units will be excavated in 10-cm levels until non-cultural material-bearing soil is reached. Vertical control will be maintained below the modern ground surface adjacent to the excavation unit.
4. Excavation documentation will consist of field notes and grid forms compiled by the excavator. The forms will contain locational, dimensional, stratigraphic, and contextual information. General notes will be kept by the project director and site assistants outlining excavation strategy and rationale, field interpretations, and decisions.
5. Feature excavation will proceed by exposing the top of the feature and the area immediately surrounding it within the excavation unit. A small portion of the feature will be excavated to collect soil samples for ethnobotanical analysis and assessment of potential for chronometric study. The feature fill will be described using a Munsell Color Chart and standard geomorphological terms.

Once the samples are collected, the feature will be tied into the grid system. Any drawings will include a scale, north arrow, and key to abbreviations and symbols. Written description will be done on standard forms that will include provenience, dimensional, soil matrix, artifact, construction, temporal, excavation technique, and other data. Photographs will include a metric scale, north arrow, and mug board with the LA and feature number, and date. All photographs will be recorded on a photo data sheet.

Artifacts recovered from each provenience will be bagged and labeled by unit, stratigraphic or arbitrary level, date, and excavator's name. A specimen number will be assigned to all bags by provenience and a running field artifact catalogue maintained for each site. Materials necessary for immediate preservation of fragmentary and unstable faunal and ethnobotanical remains will be used. Large lithic artifacts will be bagged separately to minimize bag wear. Very small flakes and angular debris will be placed in vials or bags within the artifact bag, so they are not lost during cleaning.

6. If significant cultural deposits are not encountered, the surface artifacts not included in the 2-by-2-m excavation units will be recorded. The lithic artifacts will be recorded according to

morphological and technological attributes. These attributes will include material type, material texture, artifact type, artifact function, condition, presence of cortex and dimensions. Core or biface reduction flakes will also have platform type recorded. Use wear or modification will be recorded, if present.

Temporally or functionally diagnostic artifacts will be collected. These artifact types may include sherds, chipped stone tools, and ground stone tools. Their location will be plotted on the site map.

7. A detailed site map using a transit or Brunton compass, 30-m tape, and stadia rod will be made. The site map will include the site limits, the excavation units, the temporally or functionally diagnostic artifact locations, and important topographic features.