

Permian Basin Programmatic Agreement

Update – March 2022

Bureau of Land Management, Carlsbad Field Office, New Mexico



This update has information about recently completed archeological excavations at the Merchant Site, a 14th Century village located in the Mescalero Plain of Southeastern New Mexico. Much was learned about the village and its environs through this work.

Mark Willis has created this conceptual view of the construction method and layout of the Merchant Site. The villagers chose to build near the edge of a ridge underlain by a thick deposit of hard caliche. Apparently, then as now building materials in the form of straight, large-diameter trees were hard to find in the region, so wattle and daub construction was used for the above ground rooms. Mesquite branches were intertwined to form a web supported by a minimal number of upright posts. This framework was then plastered liberally with mud, which when dried provided a suitable wall, the roofs were probably thatched. Though simple in concept and execution this building method was suitable for the arid environment of southeastern New Mexico.

Read more about discoveries at the Merchant Site and its unique place in prehistory inside this update.

Introduction to the Permian Basin Programmatic Agreement (PA)

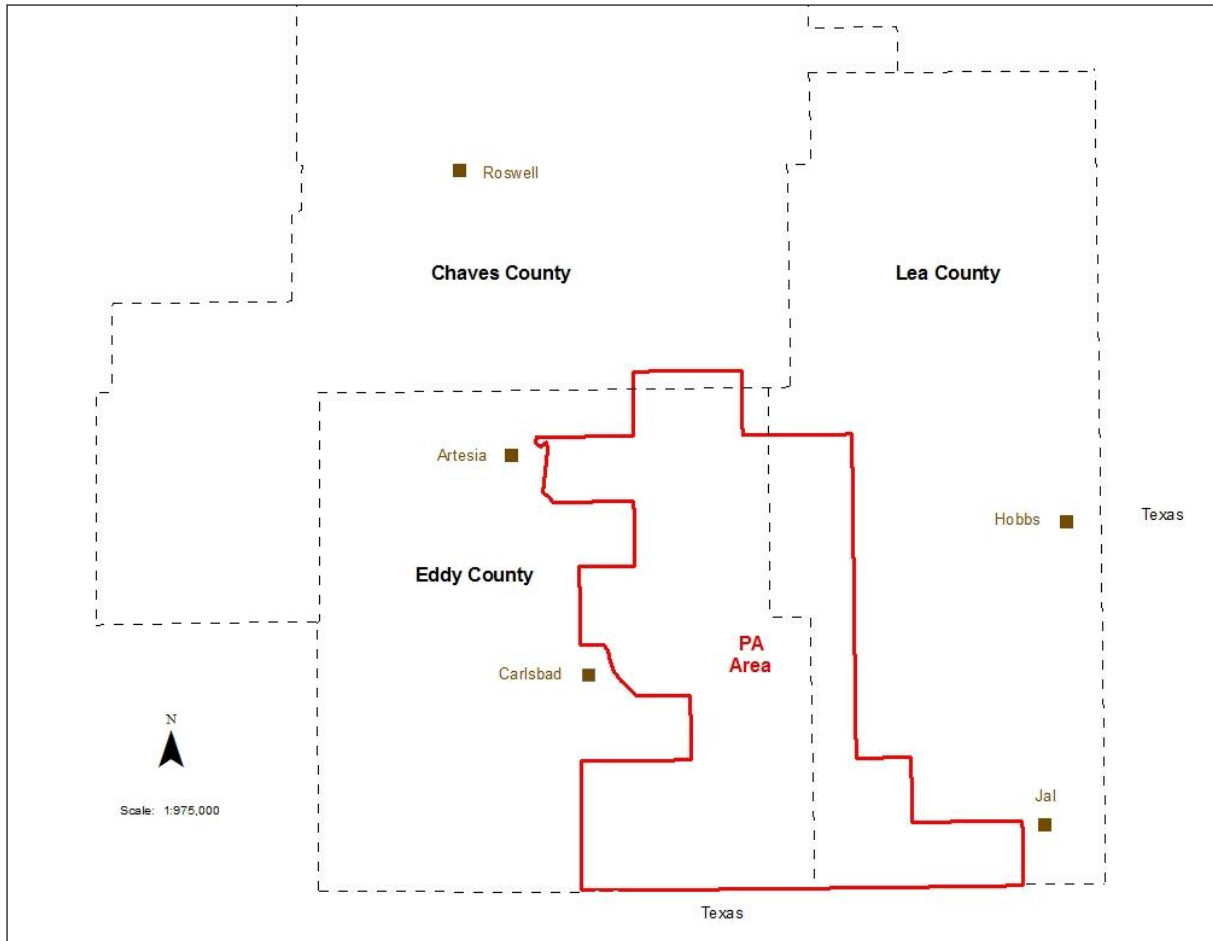


Figure 1. Map showing the Permian Basin PA Area.

The Permian Basin Programmatic Agreement (PA) is an alternate form of compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, that is offered to the oil and gas industry, potash mining companies, and for other industrial projects located in southeastern New Mexico. The PA can be used for federal projects located on Bureau of Land Management (BLM) land or BLM sponsored projects located on private property. Originally begun as a Memorandum of Agreement (MOA), it was extended for a period of three years in April 2013 as a Programmatic Agreement (PA) and the PA was further extended for a period of 10 years beginning in May 2016. The PA area is located partially in Chaves, Eddy, and Lea counties. Proponents of projects within the PA area may contribute to a dedicated archeological research fund in lieu of contracting for project specific archeological surveys, provided their proposed projects avoid recorded archeological sites. This dedicated fund is used to study the archeology and history of southeastern New Mexico. The research goals of the Permian Basin Programmatic Agreement are to study human adaptation and social organization through time and space within the Carlsbad Field Office specifically and more generally within southeastern New Mexico and Trans-Pecos Texas.

Permian Basin Programmatic Agreement Update

The Covid-19 pandemic affected all aspects of American society, including archeological research undertaken in support of the Permian Basin PA. Project time schedules were extended in response to delays in completing field and laboratory work, but one project (reported in this update) and portions of others have been completed. Table 1 provides information about projects yet to be completed.

Table 1. Current Permian Basin PA Projects		
Title	Type of Project	Researcher
BPA Project #9 - Archeological Survey of Rock Ring Midden Sites in the Carlsbad Field Office, New Mexico	Archeological survey of 7 large study units in the western part of the Carlsbad Field Office containing primarily burned rock middens.	Statistical Research, Incorporated
BPA #11 – TRU Archeological Survey of the Salado Draw Drainage, Geomorphological Investigations within Salado Draw and Preliminary Investigations at 35 Sites in Salado Draw, Carlsbad Field Office, New Mexico	This project examines the use of Salado Draw from Paleoindian times circa 10,000 B.C. to the present day.	Statistical Research, Incorporated
BPA #12 – Survey and Evaluation of Potential Mescalero Apache Traditional Cultural Property (TCP) Sites within the Carlsbad Field Office, New Mexico	21 localities will be examined with a focus on sites that may date from circa A.D. 1540 to the present.	SWCA Environmental Consultants
Abbreviations Used in this Table: BPA = Blanket Purchase Authority is a type of contract used to fund PA projects. TRU = Transect Recording Unit is a type of survey technique that examines equally sized tracts of land (currently 10 meter square parcels) that can be tied to UTM mapping points. This technique is preferable for sites located in loose sandy soil that is subject to wind erosion.		

As these projects, or discrete segments of the projects, are completed an update will be provided to inform Permian Basin PA contributors and other interested persons of the progress being made.

Additional Excavations at the Merchant Site

The project “BPA Number 10: Additional Investigations at the Merchant Site (LA 43414) and TRU Survey at 51 Sites in the Carlsbad Field Office New Mexico,” has been completed under a Blanket Purchase Authority (BPA) contract. This work involved follow-on small-scale excavations at the Merchant Site (LA 43414), a Transect Recording Unit (TRU)

survey in the Merchant Site vicinity and an examination of 51 sites scattered across the Mescalero Plain physiographic region that were thought to date to the same general time period, circa A.D.1100 – 1500. The results of this ambitious project answer questions about the Merchant Site that were posed by an earlier remediation project there, while bringing into sharper focus the research potential of sites that could be related in time or by cultural affiliation.

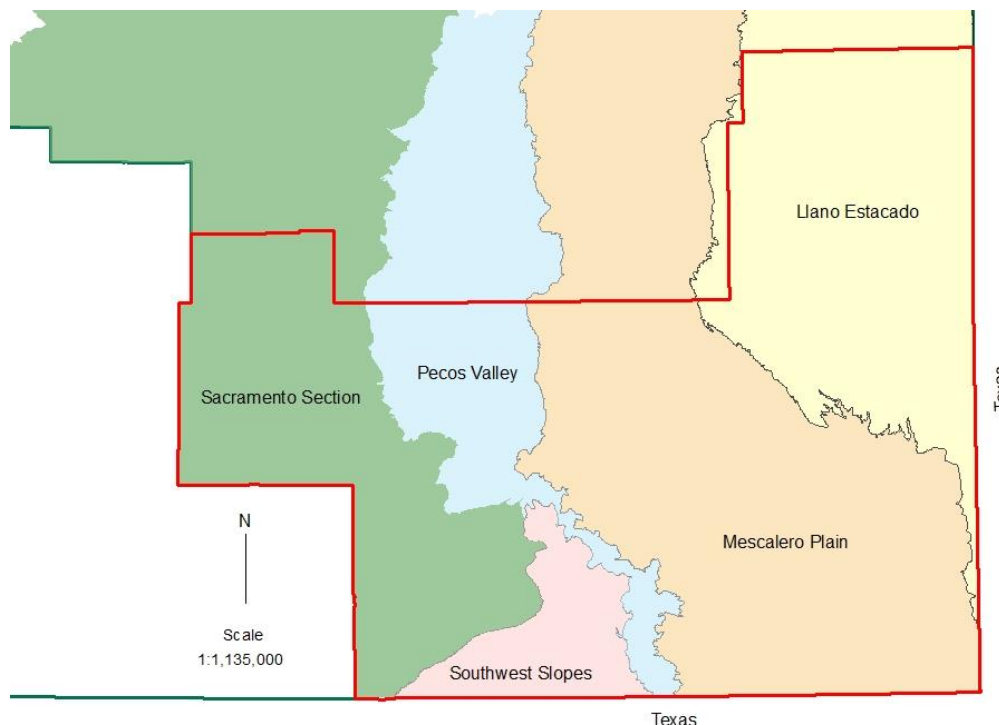


Figure 2. Map of physiographic regions. Carlsbad Field Office boundary is in red.

The more that is discovered about the Merchant Site, the more it is apparent that it belongs to a small number of sites that radically differ from the majority of sites in the Carlsbad Field Office in size and composition. Village sites in southeastern New Mexico have conventionally been interpreted as short-term settlements occupied by mobile hunter-gatherer/horticulturalists. The Merchant site was first excavated by the Lea County Archaeological Society (LCAS) between 1959 and 1965, but the results of the excavations were never fully reported. The primary remains of the Merchant site consists of a group of domestic rooms with stone foundation walls, two deep pit structures, and extensive trash middens. The excavated units and features were never backfilled. In order to remedy this situation, the Carlsbad Field Office contracted Versar, Inc. to perform remedial mitigation and investigation of the Merchant site (*The Merchant Site: A Late Prehistoric Ochoa Phase Settlement in Southeastern New Mexico*, by Myles R. Miller, Tim B. Graves, and Robert H. Leslie, 2016). We are interested in the ancient history of the Merchant Site, but its recent history in large part determines what can be discovered and, unfortunately, the recent history of the site includes episodes of looting.

A Brief Recent History of the Merchant Site

Collecting artifacts from prehistoric sites has been a commonplace activity in all parts of the United States for many years. The most common artifact type collected is stone projectile points, or arrowheads. Collectors most often find projectile points on the ground surface where they are exposed by erosion or by man-made disturbances, such as plowing agricultural fields. There are instances, however, where people have dug into archeological deposits in search of artifacts and the Merchant Site belongs in that unfortunate category. Federal laws and regulations protecting archeological sites were not in effect when the looting took place at the site, that is located on federal land. The 2015 remediation and excavation report notes:

One of the more significant aspects of the Merchant site is the exceptionally high number of projectile points recovered by the LCAS excavators from 1959 to 1965. Leslie describes the type assignment and general provenience of 1,608 projectile points recovered from the pit structures, domestic rooms, and refuse areas of the village area. This total is even more striking considering that an unknown number of points, perhaps a thousand or more, were looted from those deposits before they were documented by Leslie and the LCAS. In his 1965 article, Leslie (1965a:28) states that, based on statements from several informants, over 3,000 points were collected from the site (Miller et al 2016:383).

In their search for arrowheads the looters dug into all parts of the site, from shallow surface rooms to the deep pit structures, destroying the context in which the projectile points and associated artifacts were located. This indiscriminate digging also damaged or destroyed the remains of walls and floor features in the surface rooms, as well as walls and the stratigraphy of the pit structures. This contextual information is fragile, but vital for interpreting the construction and use of the site by its original inhabitants.

The Lea County Archeological Society (LCAS) was a group of amateur archeologists active during the late 1950s and 1960s. Robert H. “Bus” Leslie was the primary investigator of the Merchant Site and though he had no formal training or archeological education, he understood and practiced the principals of systematic excavation and recording. All the LCAS work was done voluntarily on weekends over a period of six years. Leslie produced a draft report of the LCAS excavations and interpreted the site according to the current state of knowledge of the archeology of southeastern New Mexico.

Doctor John Speth, of the University of Michigan, mapped the site and made minor test excavations there in 1984 in advance of proposed additional excavations. These excavations never came to pass, but the collections he made were used by students for ceramic and lithic studies. Doctor Speth served as an advisor in the subsequent Permian Basin PA sponsored contracts.

The remediation project was focused on the portion of the site that contained surface rooms, middens, and two large pit structures and the field work was accomplished in 2015. This part of the village had also been a magnet for looters and the target of the LCAS excavations, which left

it a confusing and jumbled mixture of intact site remnants, looter pit intrusions, mounded areas of original midden, backdirt from excavations, and two large depressions resulting from the



Figure 3. Evidence of looting at the site circa 1959. Strip looting is visible in the deep furrows to be seen in the right side of the photograph and the spoil piles in the center of the photograph. (from Miller et al 2021:Figure 6.1).

excavation of the pit structures. The goals of the remediation project were to determine what was left of the site, what its potential research value might be, and to fill the depressions and otherwise stabilize the site. Leslie's report was a valuable guide as the field crew excavated portions of the two pit structures and examined remnants of surface rooms and middens, as it could often describe what the missing deposits contained and thus complement the contemporary observations.

At the end of the remediation project, it was apparent that the site was an important place in the geography of the Mescalero Plain circa A.D. 1300 - 1400. It was a village of long-term habitation with a yet undetermined number of surface rooms and two pit structures that had been constructed by hacking through a thick, flint-hard caliche layer that underlay the ridge. The effort that was expended to create these subterranean rooms was one indication of their importance to the villagers. Other clues to their importance were found in the report of the LCAS excavations. Pit Structure 1, damaged by looting while being excavated, had a stratigraphic record showing the existence of two floors separated by a deposit of red sandy clay, indicating its abandonment for a period of time and then subsequent reuse. The end of the second period of use was marked by the upper floor (Floor 2) with a deposit of artifacts and animal bone and above that a 38 cm (approximately 15 inch) thick layer of densely compacted animal bone of primarily large animals (bison, deer, and antelope). The 2015 re-excavation of

the lower floor (Floor 1) discovered surviving patches of plaster on the floor and 11 subfloor features including 6 postholes, 2 hearths, two ashpits, and a storage pit. The storage pit had an intact bifacial mano and other artifacts, indicating it had been overlooked some 50 years earlier. Pollen and phytolith samples were taken from intact features and flotation of feature fill found charred plant remains.

Pit Structure 2 had a similar history. It had been badly damaged by indiscriminate digging by looters. Knowledge of this structure was also limited by the brief attention given to it by the LCAS crew in comparison to the effort expended on Pit Structure 1. Leslie's written description has only general details about the structure's dimensions and brief notes about the nature of the fill and the artifacts it contained. The 2015 Versar examination of the remnants of the structure showed that practically nothing of the structural details survived the looters and that, while artifacts were present in the fill they were mixed with modern tins, cans, nails, and wire. A unique feature in one corner of the structure is the presence of a fissure, or pipe in the caliche bedrock that extends 2.2 meters (almost 7 feet) below the original ground surface. Rounded pipes and vertical fissures are naturally occurring features in the caliche bedrock of southeastern New Mexico. A section of milled lumber (2 inches x 4 inches) was found at the very bottom, indicating the looters' perseverance in searching for artifacts.

Stone and ceramic artifacts, along with animal bone and caliche cobbles were found in all the 2015 excavation units, although most were not in their primary contexts. Both the looters and the LCAS excavators kept only whole stone artifacts or larger pottery sherds, so much of the additional information normally obtained from the examination of stone waste flakes, ceramic sherd studies, and animal bone analyses was never attempted.

The 2015 work also included a Transect Recording Survey (TRU) survey of the ridge on which the village was located. A surprising find northwest of the village was evidence of gardening, in the form of linear alignments of stacked caliche nodules, indicating possible check dams and a grid garden. In other parts of the Southwestern United States and northern Mexico people used cobble-bordered fields, mulch fields, cobble terraces, or other forms of gridded fields to conserve moisture for dry-land farming or gardening. A later report noted:

The survey impressions indicated that a landscape of intensive agricultural features may have existed north and northwest of the village (Figure 10.2). The reality became more apparent as the results of pollen and flotation analyses from Pit Structure 1 revealed that maize pollen and cupules, kernels, and cob fragments were present throughout the fill and floor features. The high counts and sample ubiquity measurements for maize plant parts and the presence of maize pollen confirmed that corn was grown somewhere in the vicinity of the Merchant site (Miller et al 2021:227).

Unfortunately, with the limited excavation done under the terms of the contract it was not possible to confirm the cobble alignments were constructed for use as grids for crop-growing. At that point it remained an intriguing probability.

The remediation project produced an informative synthesis combining the results of a 50-year-old excavation, enhanced by the selective re-excavation of a selected number of site features.

The Versar excavators collected samples for radiocarbon dating, pollen, and phytolith identification, as well as charred plant remains and animal bones. A sample of artifacts including bone, shell, stone, and ceramic items were collected for material culture studies. The village location was further defined by a systematic survey of the ridge on which it was located, and this resulted in the identification of probable horticultural fields. The village, home to people in the 14th Century, was beginning to reacquire its physical identity, at least on paper.

A Plan for Additional Work

The 2015 remediation project produced more than expected, but there were still sizeable gaps in our knowledge of the site, its development, and its place in the prehistory of southeastern New Mexico. Several factors can be cited for this, the scope of the remediation contract limited the amount of time and excavation that could take place, which resulted in key areas of the site being unexplored, in particular the surface room layout and sequence of construction was unknown. The 2015 work demonstrated that significant new knowledge could be gained from an analysis of the flaked, ground stone, and pottery artifacts recovered from the site's three middens. Although a projectile-point-type study had been completed by Leslie, other artifact classes were less well known. Additional work could also confirm the presence of the postulated grid gardens, which would be the first evidence of intentional crop growing in southeastern New Mexico in prehistoric times. Finally, a systematic survey around the depression on which the site is located, might reveal relationships between the Merchant Site and other sites located nearby. This second season of work at the site was primarily undertaken in 2019.

A new contract was issued to perform these tasks. The new contract also included the systematic TRU survey of other sites in the Mescalero Plain that had been recognized as potentially important village locations or that were dated to the period A.D. 1100 – 1500. The close examination of these sites might result in the discovery of distinctive Ochoa Ware potsherds, such as those found the Merchant Site, which could provide clues to the geographical extent of the villagers' contact. The roster of sites would also provide a database for future investigations of the social and technological changes taking place during this time period.

The Site Surprises Again – Room and Room Block Excavations

The LCAS investigated 7 of the 21 surface rooms they documented at the site. The published map of their investigation shows a small chain of three connected rooms, with other individual rooms scattered north and south of the two pit features. The LCAS excavations were completed under trying circumstances, because looters constantly destroyed portions of the site while the LCAS members were absent. The 2015 remediation did not include a component to find or excavate surface rooms, although 13 new or possible rooms were identified through surface inspection. At the close of the 2015 remediation a map showed a slightly compressed “L” shape of rooms located north of Pit Structure 1, with scattered rooms north and south of Pit Structure 2. Two isolated rooms were located between the two pit structures and south of one arm of the “L.”

One of the isolated rooms between the two pit structures was chosen as the beginning point for the 2019 investigation. The LCAS excavators had tested this room and found burned construction material on the floor indicating that this room apparently had escaped the looting

that was evident in this portion of the site. It was expected that this room would provide valuable information about the architecture of the surface rooms and the nature of their abandonment. What was unexpected was that evidence for additional contiguous rooms connected to this room was uncovered. Ultimately a series of seven contiguous rooms was excavated and adjacent areas or wall segments of another 11 adjoining rooms was exposed.

The purpose of the excavation of these rooms was to define the attributes of the domestic architecture, determine the nature of the floor features and artifact assemblages on the floor, describe the abandonment mode of the rooms, and determine the method or methods used to join the rooms together as a unit. The analysis of this information could reveal aspects of daily life and social organization not readily apparent otherwise. The excavation could also serve as a rough form of quality control by comparing the 2019 observations with those of the LCAS. Finally, the excavations might find clues to further refine the nature of the relationship of the rooms to the two pit structures.

The portion of the site in which the rooms are located was heavily impacted by looting. Most rooms had a large looter pit in the center of the room. The consistent placement of these pits suggested that the tops of walls were visible in the 1950s and 60s which allowed looters to target room centers. The pits removed large portions of the fill, damaged floors and floor features, and in some cases destroyed foundation walls. Historic artifacts from the 1960s were found in these pits including the seemingly intentional placement of cans. Despite this handicap, the 2019 Versar excavations managed to meet most of the goals set out for this portion of the project.



Figure 4. Historic *jacal* House in Ojinaga, Chihuahua, Mexico. The Merchant Site Rooms may have been constructed in a similar manner (Photograph credit Rescuing Texas History 2016 Archive, Texas A&M University, Kingsville).

Two major attributes of the room architecture are the construction method of the walls and roofs. Wall construction evidence is primarily of the foundations, and there appears to be little regularity or standardization in how the foundations were built, even within a single room. All of the excavated rooms had two types of foundations that could be chosen from these types: a

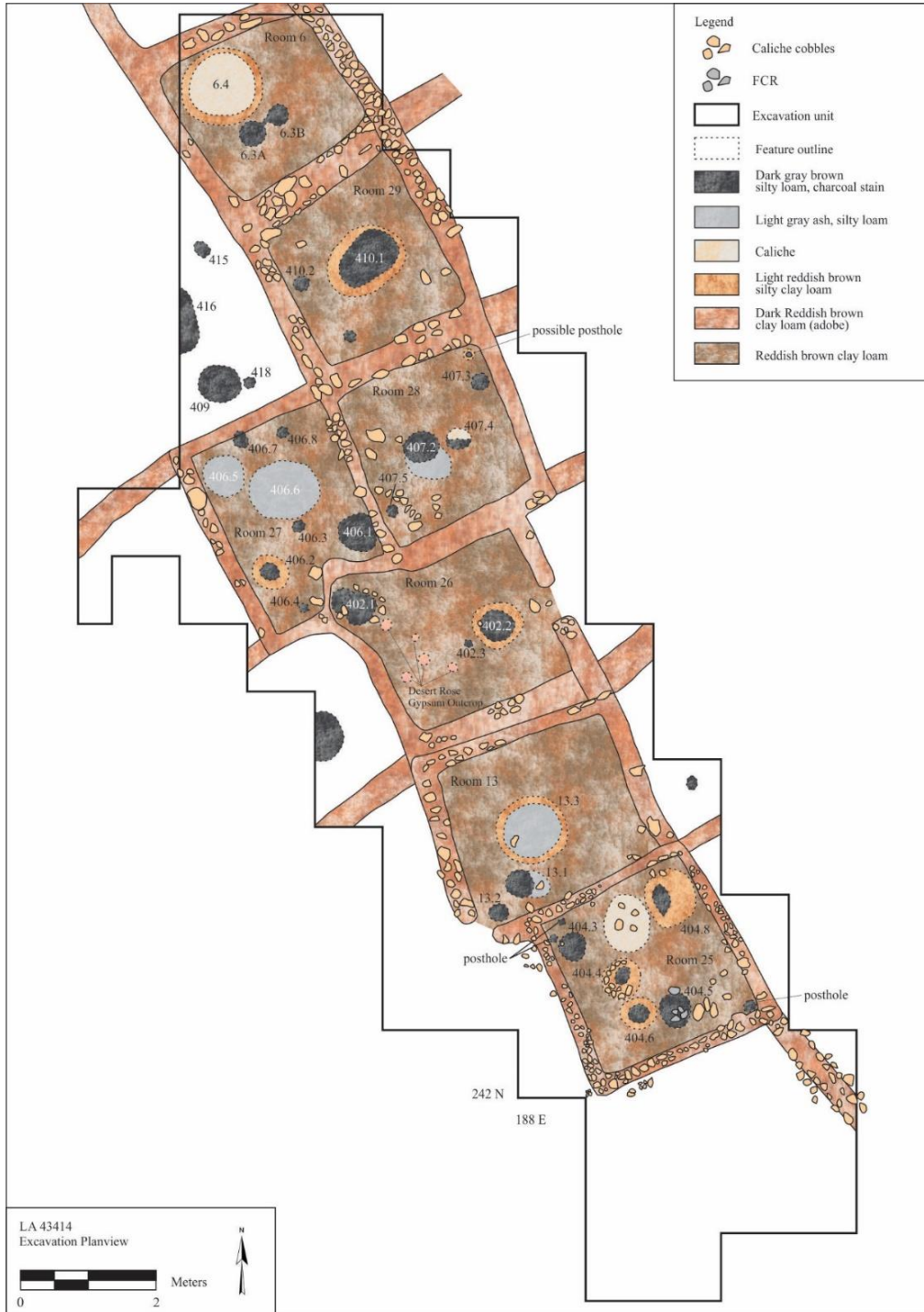


Figure 5. Map of excavated rooms (from Miller et al 2021:Figure 6.4).

mass layer of flat cobbles, two rows of flat cobbles, a row of upright slabs, or parallel rows of tabular cobbles. Wall construction is conjectured to be of light weight poles or branches plastered with adobe. The absence of intact wall remnants or thick layers of wall or roof melt, all support this supposition. The absence of primary roof supporting posts indicates roofs were not substantial and heavy, such as are found with adobe or masonry pueblos with primary beams, cross-members, *latillas*, and roofing material, such as thatch and adobe, daub, or mud. The Merchant roofs were probably simple pole and thatch coverings.

The rooms are small, averaging from 6.09 square meters (approximately 65 square feet) in area when compared to typical rooms from pueblos in the Jornada region to the west which average over 15 square meters (approximately 161 square feet) in area. Only one of the rooms had evidence of a prepared floor, consisting of a layer of caliche or daub plaster, the others had compacted naturally occurring soil. Three of the rooms had two floors, as did a room excavated by the LCAS, and there were probably others, but they may have been destroyed by looter pits and natural erosion accelerated by that disturbance.

A hearth was present in each room, located approximately in the center. Rooms with two floors had a hearth in each floor, while some rooms had two hearths indicating remodeling. Four rooms had slightly raised collars made of clay outlining their hearths. A shallow pit approximately hearth size, was the only other common floor feature. The purpose of these shallow pits is unknown at present. Two rooms had small ash disposal pits. A few small postholes were noted near the walls of one room.

Very few artifacts were found on the floors, having been left there or intentionally placed there by their former inhabitants. Five specimens of gypsum, "Desert Rose," concretions were left on the floor of Room 26. Other rooms had isolated items, animal bone, sherds, lithic flakes, projectile points, and a fragment of a stone palette. The earlier LCAS room excavations found the same situation, with the exception of a cache of Chupadero Black-on-white sherds in one room and three groundstone tools placed against a wall in another.

Room orientation angle was measured along the southern wall of each room. There appears to be little standardization among orientations, but there is a shift in orientation between the two northern rooms (6 and 29) and those below it, indicating the southern rooms were built at a different time. Jornada pueblos of south-central New Mexico are conventionally oriented at 77 degrees azimuth, which approximates the spring equinox, but excavated rooms at the Merchant site are oriented at 48, 58, and 68 degrees. It is not apparent that these orientations refer to phenomena beyond the village limits. This may be a result from the first rooms being built following the contour of the ridge, while the rooms in the western arm of the room block may be oriented to Pit Structure 1 and the rooms in the eastern arm are oriented toward Pit Structure 2.

Determining how the rooms were joined together in a room block directly relates to the process used in the establishment and growth of the village. Two types are recognized in the Southwest, the "ladder" and "agglomerative" process. The ladder process uses one or two foundation walls to form common walls for a series of linear rooms approximately of similar size and orientation



Figure 7. A portion of the 2019 site map showing the location of rooms and room blocks.

Two excavated rooms were located south of Midden B and there are indications that another block of rooms extends along the ridge in that direction.

Stone and Ceramic Artifact Analysis

Ceramic and lithic artifacts were recovered from all of the Versar 2015 and 2019 excavations. Similar artifacts were also found in the earlier LCAS excavations, but they are no longer available for study and a modern researcher must rely on Bus Leslie’s description and analysis of these artifacts.

Ochoa Ware

Ochoa ware is the diagnostic pottery of Ochoa Phase sites in southeastern New Mexico. Ochoa Indented Corrugated was named and described by Leslie in 1965 and additional details of the type came from a 1968 study of Ochoa Phase sites in nearby Andrews County, Texas. The name Ochoa came from a ghost town, inhabited in the 1920s and 1930s, that was locally famous as a source for bootleg whisky during the Prohibition years. The second season report notes:

Ochoa Indented Corrugated is the primary type, and perhaps the only type, of Ochoa ware. As corrugated wares go, it is a comparatively exuberant or elaborate style of corrugation (Figure 16.1). It is characterized by distinctively textured surfaces with indented, scallop-like corrugations formed by impressions that were most likely made with the fingertip (Miller et al 2021:379).



Figure 8. Ochoa Indented Corrugated potsherd (after Miller et al 2021:Figure 16.1)

The pottery study included a functional, stylistic, technological, and compositional analysis of the ware. Ochoa pottery forms include an everted rim globular jar, a short-necked jar, and a hemispherical bowl with vertical or slightly outward slanting walls. These vessel types are determined by an examination of rim sherds, since there is only one partially reconstructed vessel known at present, a jar from a site in Texas (see Figure 9). The jars were used for storage, but the presence of soot deposits and burned surfaces on some sherds from the Merchant Site indicate that they were also used for cooking.

The corrugations are created by joining successive coils of clay on top of each other. An indentation is created by pushing the clay straight down with a finger or tool, creating a set of parallel, U-shaped indentations. The indentations on the next coil may be aligned vertically (51.5 percent of a sample), unaligned (42.4 percent of a sample), or alternating stacked aligned (6.1 percent of a sample).

A sample of sherds from the Merchant Site, along with Ochoa ware sherds from two other sites, were submitted for neutron activation analysis (NAA) and petrographic analysis. NAA analysis identifies the elemental composition of the clay used in the vessel, while petrographic analysis identifies the non-plastic inclusions used for temper. NAA results are identified as chemical composition groups.

These NAA results were compared to previous NAA analyses of Ochoa sherds from the Merchant Site and other sites in Texas to "... further refine the series of chemical composition groups in southeastern New Mexico and west Texas, identify geographic production areas for those groups and ultimately to examine the direction and magnitude of inter-village exchange of Ochoa ware ceramics across the region (Miller et al 2021:396)."

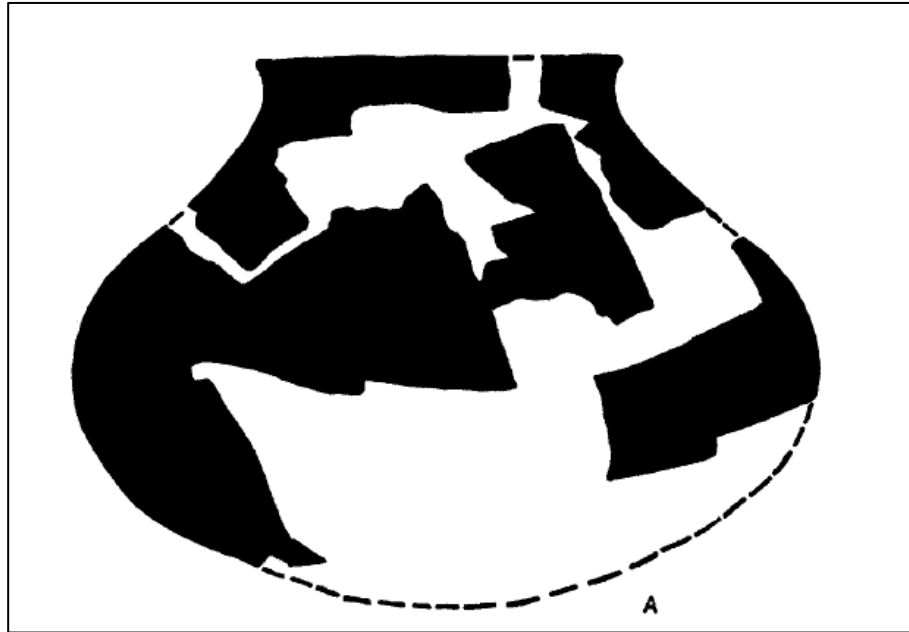


Figure 9. Partially reconstructed Ochoa Indented Corrugated vessel indicating its shape (after Miller et al 2021:Figure 16.9).

The comparison produced a series of four Ochoa compositional groups, with the majority of the sherd samples belonging to Group 1 Merchant Main Ochoa. This result partly reflects the fact that fewer sherd samples from Ochoa Phase sites in Texas have been analyzed. Group 1 Ochoa Main sherds include all varieties of paste, surface treatment, corrugation treatment and soot or burned exteriors seen in the assemblage from the site. Though varied in their exterior attributes, these sherds have a high degree of homogeneity in element concentrations.

This compositional group is also unique in its restricted geographical distribution, since all sherds included in the study belong to that group. This result duplicates that of an earlier study which means that all Ochoa ware samples from the Merchant Site are assigned to a single chemical compositional group. This situation is rare for sites in southeastern New Mexico, most sites have from two to five compositional groups represented, indicating trade or contact with other locations producing the same pottery type.

The petrographic analysis was intended to examine whether crushed caliche was the temper used in making Ochoa vessels. Small fragments of caliche can be found protruding from the surfaces of some sherds and it was originally assumed that caliche was intentionally added to the potters' clay. The petrographic study of seven sherds indicated they all had analogous compositions. The clay appears related to shale, with natural inclusions dominated by quartz grains. Other frequent components are caliche fragments (some with quartz, feldspar, and chert inclusions), quartzite and chert. Nine other types of small rocks and mineral grains were noted to occur.

No specific source of pottery clay is known at present, but a source was probably located in the vicinity of the Merchant Site. Along the margins of the ridge, on which the site is located, are downcutting washes through sandstone, shale and caliche members of the Ogallala Formation.

This erosion can form a secondary deposit of clay with disaggregated sandstone minerals and fragments of caliche, such as those seen in the petrography samples.

Stone Tool Analysis and Stone Sourcing Studies

The analysis of stone artifacts recovered from the two seasons of excavation conducted by the Versar archeologists had two objectives. The first was to recognize the full range of formal tools present in the Merchant Site assemblage to better make comparisons with contemporary sites in the Plains, Southwest, and Central Texas. The report states the second objective as follows:

The second goal of the analysis was more complex and nuanced. The Merchant site presents an intriguing context for the study of the flaked stone technology, raw material procurement, and settlement organization. In the discussions to follow, a series of debitage attribute analyses, raw material identifications using visual and ultraviolet fluorescence, and comparative data on tool forms are combined to develop a model of flaked stone tool and material use. The ultimate conclusions are that the nature of lithic reduction and material use are conditioned by the technological requirements of long-distance hunting by groups residing at a sedentary village. Additionally, the predominance of distant material types offers important insights into where the Merchant hunters were traveling to and from where they were bringing back certain materials (Miller et al 2021:439).

The Versar study examined shaped tools, such as projectile points, scrapers, and knives, that are typically the focus of most excavation reports. These artifacts were featured in the LCAS report of the Merchant Site, and Leslie further developed a point typology for southeastern New Mexico. The Versar study also incorporated classes of stone artifacts, flake debitage and cores, as well as cobble tools, that were ignored in the LCAS report. The report noted an introduced bias in the distribution of projectile points and formal tools across the site caused by the removal of complete specimens by looters and the LCAS excavators. There was also evidence of patterns of artifact disposal by the original inhabitants involving where certain activities took place across the site. A significant example is Pit Structure 1, where 737 projectile points and 118 formal tools were recovered. These numbers are only a partial count, since large quantities of points and other formal tools were removed by looters. A mass of animal bone was deposited as a layer in the uppermost fill of the structure, but also hundreds and perhaps thousands of projectile points and formal tools were also placed with the bone as a closure deposit.

The raw material used to create these thousands of artifacts also figured prominently in the study. Cherts and translucent silicified materials were used to produce over 85 percent of the artifacts. Translucent silicified materials, includes chalcedony, translucent fine-grained cherts, and some opalized caliche, and other unidentified fine-grained, often glassy-textured stone. Smaller quantities of artifacts in the study included quartzite (7.9 percent), limestone (4.2 percent), rhyolite (0.8 percent), basalt, quartz, and sandstone, were all at 0.4 percent. The different stone types were used for different artifacts, for instance, sandstone was commonly used as grinding stones for manos and metates; tough quartzite flakes for stripping agave leaves for fibers or for woodworking; while obsidian, fine grained cherts and translucent silicified materials were used for projectile points or knives.



Figure 10. Examples of side and basal-notched projectile points included in the study. The translucent silicified material points are lighter color (after Miller et al 2021: Figure 17.14).

The sources of this stone were partly local, for instance, sandstone and limestone was exposed as bedrock along the sides of the ridge on which the site was located. Regionally, chert cobbles are found as lag deposits, eroded from the Ogallala formation, or in Pecos River terraces. Opalized caliche is also found in bedrock exposures of the Caprock front of the Llano Estacado or its remnants. The other stone, obsidian, some cherts, and translucent silicified material, however, came from distant sources. Only three obsidian artifacts were recovered in the Versar excavations. These were analyzed using X-Ray Fluorescence to identify the sources as Cerro Toledo Rhyolite, also known as Obsidian Ridge, and from the Valles Rhyolite (or Cerro del Medio) sources. Both obsidian sources are found in the Jemez Mountains of northern New Mexico, but small nodules of Cerro Toledo Rhyolite can be found in Rio Grande gravels as far south as Las Cruces, New Mexico.

The chert and translucent silicified material that composed the majority of the artifacts and debitage (the waste flakes resulting from manufacture, maintenance, or repair of stone tools) from the site could be classified on the attributes of color, texture, and translucence. Since many of the stone flakes were small (less than 5 or 10 mm in length), this sort was assisted using both a long-wave and short-wave ultraviolet fluorescence examination of these same artifacts to

identify sources. This study found that a statistically significant sample of the stone flakes originated from stone sources in central Texas and from the Texas Panhandle.

Further Exploration of Gridded Fields

The 2015 remediation project sampled an area north of the village that was presumed to be the location of gridded fields, square or rectangular cells formed by clearing caliche from the center of each cell to its edges. Also present were check dams, linear alignments of rocks placed at right angles to the slope of the land. However, the limited work in 2015 failed to confirm this supposition. A major obstacle to seeing, excavating, and interpreting the grids is that the sandy soil in the locality has been eroded through time by wind, cattle grazing, and animal burrows. The result is a landscape of coppice dunes and scattered caliche rocks on the surface and near surface, coupled with the destruction or mixing of the upper portion of the soil horizon.

The 2019 effort included mapping the landform to show the topographic setting, opening a larger contiguous area within the grids, collecting additional pollen and phytolith samples, and digging a control trench to bedrock in an area away from the grids. The larger area excavation exposed portions of the grids, in particular the corners. Additional pollen and phytolith samples were

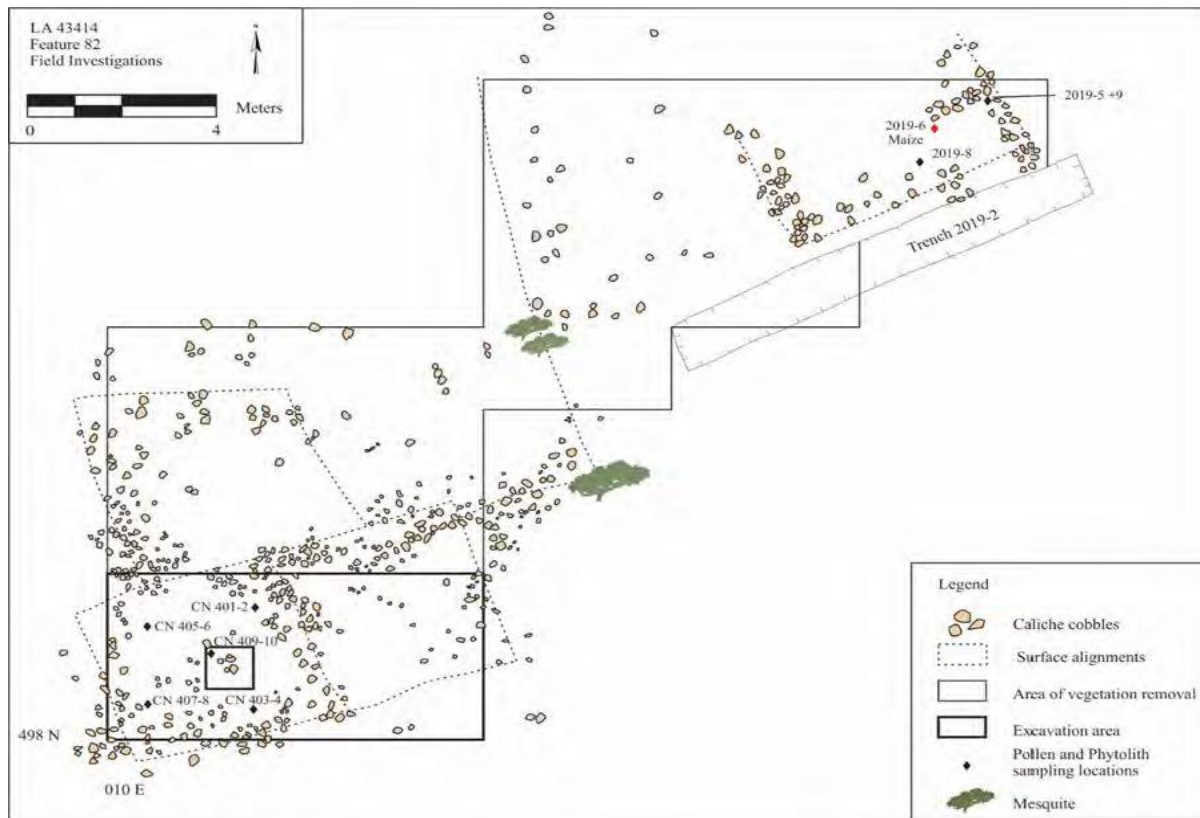


Figure 11. Map of grids formed by stacking caliche nodules. (from Miller et al 2021:Figure 10.15)

taken at more shallow depths than those from the 2015 work and two of these had maize (corn) pollen. The phytolith samples had no maize, but potentially supporting evidence of cultivation included phytoliths resembling dayflower, which are found in prehistoric agricultural fields at sites in Arizona and New Mexico, occurring in 68 percent of sites that have cultigens present. Also included in the samples were phytoliths of *Nitzschia* species diatoms. These diatoms originate in freshwater and thrive in moist soil. Their abundance in the grids and at a sampled check dam, indicates the retention of water at those locations.

Bedrock Modifications

A total of 262 bedrock modifications in the form of grinding basins, mortar holes, and cupules were recorded in the vicinity of the Merchant Site. These features were created on exposed sandstone bedrock or on eroded free-standing boulders. There are other recorded sites around the large depression and ridge upon which the Merchant Site is located, but we can assume that some of these features were created and used by the villagers. The grinding basins have a shallow depth, up to 3 cm deep, and are saucer-shaped in profile. The mortar holes have oval openings, with cavities that are “boat-shaped,” having sloping walls in profile length and relatively straight-sided walls in profile width. The mortars were used in conjunction with stone or wooden pestles to pound foods. Five phytolith samples were examined from bedrock mortars, but none were from economically useful plant species. Mortars were traditionally used to process foods such as mesquite pods or acorns. Cupules are small dimples in the stone and serve an enigmatic purpose, although they have been called “nutting stones” in other parts of the country, for their supposed use as shallow depressions to hold nuts while cracking them open. The bedrock modifications recorded in this project will be discussed, along with those recorded in two other Permian Basin PA projects, in a future Update newsletter.

Interpretation of the Merchant Site

Radiocarbon dating of rooms, pit features, and archeological deposits at the Merchant Site indicate it was inhabited during the period from A.D. 1300 -1350. Based upon the informal nature of the architecture, the lack of human burials, and the ceramic discard rate in the middens, the village was probably occupied for 30 to 50 years. The site is affiliated with the Ochoa Phase, a poorly understood archeological culture dating from A.D. 1300 -1450. A limited number of Ochoa Phase sites have been recorded in southeastern New Mexico and west Texas, but only one other site has been investigated. A village location, the Salt Cedar Site, in Andrews County, Texas was excavated in the 1960s by a group similar to the LCAS, but only a portion of the site, excavated by a University of Texas student, has been analyzed and reported upon.

The Merchant Site locality also has evidence of sites from earlier periods, indicating this geographic location was favored through time. This may partly explain why the first Merchant settlers chose this spot. The site grew through time, but there was not a predetermined plan, as indicated by the irregular joining of rooms together that was discovered in the 2019 room block excavation. The total number of rooms present at the site has not been determined.

Although the estimated time of occupation of the village is as long as 50 years, it was not a

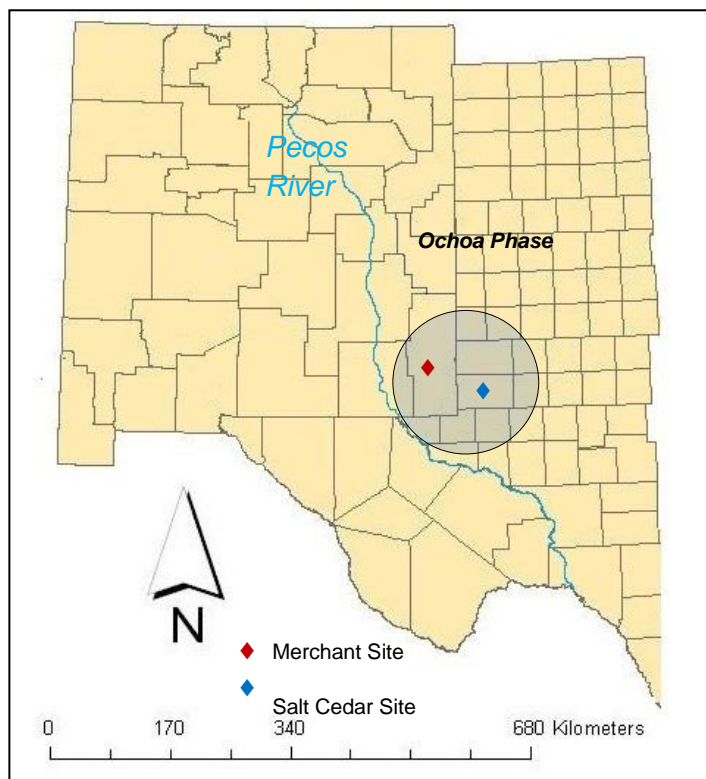


Figure 12. Extent of the Ochoa Phase in New Mexico and Texas.

continuous occupation. Pit Structure 1 and three rooms excavated in 2019 had evidence of two periods of use, evident in the superimposed floors present in each architectural type. Pit Structure 1 had a zone of reddish sandy clay, that was mostly free of artifacts, above the first or lowest floor. This 46 cm (approximately 18 inch) thick deposit of soil indicates that for an unknown period the pit structure was open to the elements. This occurred after the pit structure had been in use as evidenced by the presence on the floor of two hearths, two ash pits, six postholes and one storage pit, containing a complete bifacial mano, bone fragments, and stone flakes. Two of the rooms had floors separated by 10 cm of fill and one room had a lower floor 17 cm to 27 cm below the first.

The two pit structures were called rooms or pithouses by the original LCAS excavators, but for a number of reasons including the size and content of Pit Structure 1, which was the best documented of the two, Myles Miller, the Principal Investigator, suggested a better interpretation for that structure was that of a civic-ceremonial room, analogous to a kiva. A major event in the use of the civic-ceremonial room was its apparent abandonment, documented by the thick layer of artifacts and animal bone at the top of its deposits. This has been interpreted as a ritual closing of the use of the structure by the inhabitants, with the animal bones being the remains of a feast. Ritual closings of similar ceremonial rooms or civic spaces have been documented at pueblos elsewhere in southern New Mexico.

The two seasons of investigations at the site, and the incorporation of Leslie's report of the earlier LCAS excavations, have clarified the architectural layout and artifact content of the site. The reports resulting from this work have made this information available for future research and though the reports have answered many questions about the site, they have also raised a series of

new questions. Some of these questions may be answered by using archeological techniques, some may be satisfactorily answered by logically constructed interpretations of the site's archeology, but some may be unknowable due to the destruction of the site's archeological deposits by looters.

The reason for the abandonment and reoccupation of the site is one of several unresolved mysteries about the site and its inhabitants. Pit Structure 1 was refurbished with a new floor and reused, as were also some rooms, as documented by their superimposed floors, but which rooms belong to each period of use is unknown. There is also evidence for additional rooms, but their number is unknown or where they fit into the chronology of site occupation.

The village was apparently successful, attracting new members through time, as documented by the additions of new rooms to those previously existing. Life in the village was apparently peaceful. There is no evidence of violence in the form of burned structures and no human remains with signs of violence, such as arrow wounds. The village was also abandoned in a planned and peaceful manner, as evidenced by the ritual closing of Pit Structure 1.

The archeological evidence suggests that the villagers were isolated, but also acquainted with the larger world. Ochoa ware was produced at the Merchant Site, but NAA and petrography analysis shows that there was no interchange with other Ochoa ware producing villages. This is not the pattern followed by pottery producing villages elsewhere in the Southwest that have mixed compositional groups documenting such an exchange. This suggests that the Merchant potters, who are assumed to be the women of the village, had little interaction with Ochoa ware potters elsewhere and that the pottery making conventions they followed were their own.

In contrast, raw material used in the manufacture of stone projectile points indicates that some projectile points and debitage, originated from sources located in the Texas Panhandle and from central Texas. It is proposed that the men of the village obtained this stone while on bison hunting trips to those localities, in order to manufacture new points to replace those lost or broken during the hunt. Whether or not village women accompanied the men, as was common for Plains tribes during the Historic Period, is unknown.

The abundant evidence of maize (corn) found in the village refuse deposits, room and pit structure fill, and as charred material on ceramic vessels led to the search for and discovery of the grid gardens. This is the first direct evidence of gardening within the Carlsbad Field Office boundaries (6.2 million acres) and it is a testament that the Merchant Site is unique. It also is proof of the villagers' contact with, or origin, in distant crop-growing regions. Seed selection, planting methods, and critical times for crop-tending are all learned and transmitted from generation to generation. The knowledge for constructing grid gardens, as well as seed for the first planting, came from distant regions.

The Merchant Site in the Future

This brief synopsis of the archeological investigations at the Merchant Site is an incomplete summary, but it is intended to highlight some of the positive results that have come from the re-examination of the site. It is hoped also that the perception of the site is changed from that as a

good place to find arrowheads, to one that sees the site as a storehouse of information about the people who lived there and their successes. There is obviously more that can be learned at the site, but given the destructive nature of excavation, any proposed fieldwork that involves digging should be well-planned and justified. There are still studies that can be profitably carried out using the curated artifacts from the two seasons of excavation of the site. For instance, one requirement of the contract was to identify a catalog of animal bone that can be used for DNA and isotopic analysis to determine the sex and age ratios of bison remains. This can provide evidence of the seasons in which the animals were killed and thus when the hunts were organized. Other studies can be undertaken on other classes of curated artifacts.

The information in this article was abstracted from the report, “*Pueblo on the Plains: The Second Season of Investigations at the Merchant Site in Southeastern New Mexico*,” by Myles R. Miller, Tim B. Graves, Charles Frederick, Mark Willis, John D. Speth, J. Phil Dering, Susan J. Smith, Crystal Dozier, John G. Jones, Jeremy Loven, Genevieve Woodhead, Jeff Ferguson, and Mary Ownby, 2021. As a footnote we can note that this report is a culmination of a cooperative effort to understand the Merchant Site beginning in 1959 with Bus Leslie’s effort to salvage information from a site that was facing destruction from looting. The effort continued with Dr. Speth’s conversations with Bus Leslie, his mapping and testing of portions of the site and his curation of Leslie’s report. Finally, Myles Miller and the Versar archeologists spent two seasons at the site and documented their time there with observations and reports that go beyond “good enough for government work.” The 2016 report *The Merchant Site: A Late Prehistoric Ochoa Phase Settlement in Southeastern New Mexico*, was awarded a Heritage Preservation Award in 2018 by the Cultural Properties Review Committee of the Historic Preservation Division of the New Mexico Department of Cultural Affairs.

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