NewsMAC

Newsletter of the New Mexico Archeological Council

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Spring/Summer 2016 (2016-1)

Más al Sur: Research in Southern New Mexico

Contents

PRESIDENT'S WELCOME

Hello to All! In early 2016, I took over the position of President. I'd like to express my thanks to Toni Goar for all her work in the past year. I am pleased to be associated with this fine group of professional archaeologists and I look forward to upcoming events. Some of you may know me, but for those who don't, here is a brief description of some of my work experience as an archaeologist over the 30+ years that I have worked in CRM. My archaeological career started in California, where I worked for the Department of Parks and Recreation and had the pleasure of working on many of California's mission sites. From there I moved to Colorado and began to do many exciting projects in the Four Corner's area. I fell in love with the archaeology here, and ended up moving to Albuquerque. In between, I have had the pleasure of working in almost all of the Western US, Tunisia, and Guam.

But enough about me! NMAC's 2015 Fall Conference was a huge success and we look forward to 2016 with equally high expectations. NMAC is getting together the conference papers from the 2015 conference and will do the same for the 2016 papers. Look for the 2015 publication to come out in 2017. The 2016 conference "The *Spanish Colonial Period in New Mexico – A Trip Along the Camino Real"* will be held November 12th at the University of New Mexico's Hibben Center. The 2014 conference publication will be available at the upcoming 2016 Fall Conference for $18.00. An additional $5.00 for shipping will be charged if you can't pick up a copy in person on November 12th.

Please consider helping NMAC. Board positions come up for voting on an annual basis. If you have an interest in any of the open positions (President-Elect, Secretary, Workshop Committee members, and Web Site Committee Chair), please contact me at cwalth@swca.com.

Cherie Walth, NMAC President

EDITOR'S INTRODUCTION

It is my pleasure to present the Spring/ Summer 2016 issue of *NewsMAC, **Más al Sur: Research in Southern New Mexico***. I refer to this issue in part as "Spring", yet though it is well past Midsummer, because the next issue will publish in short order – conceivably while it is barely past the upcoming equinox. The current issue lagged many months because I waited for people who didn't – in the end – contribute. That was unfair to the people who did and to the people who were waiting on the edges of their desk chairs for the next *NewsMAC* – and it apparently matters not one whit to the holdups.

Everyone is not just busy, each of us is *incredibly* busy. Balancing work with family can be all-consuming, let alone trying to wedge something else into the finite, wakeful moments of a week's time. Understandably, you may have bigger fish to fry than penning even a short contribution to *NewsMAC*, or perhaps you just want to fry it in a bigger pan than *NewsMAC's*. However, if you would like to use this venue to share information with your colleagues, please contact me by phone or e-mail.

Because *NewsMAC* is an electronic publication, it is difficult to gauge how many members actually look at it when it is sent out via the NM-ARCH list. More difficult, still, is estimating how many non-members might, by whatever circuitous means, come by an issue and read it.

After the last issue sailed out into the ether, fewer than a half dozen people (as in five) offered various comments to me. The consensus was that a focus on student submissions was a good idea, that the layout – and especially the graphics contributed by the students in the individual articles – looked very appealing, and that it was nice to see a synopsis from a project funded with a NMAC mini-grant.

I didn't hear any complaints first-hand, but I realize that it's tough to grouse too loudly to somebody who puts the *NewsMAC* together for fun. While rumors that I am grumpy are most likely true, I would very much like to hear from you, even if you don't like something, as well as if you do.

Dutifully, I have endeavored to provide in this issue more of what the five of you who commented liked about the last issue. Although this issue is dedicated to research in southern New Mexico, a featured student presentation is still included. Also included is the summary of a project funded by a NMAC mini-grant. Project summaries for *NewsMAC* are required of those who are NMAC mini-grantees, so if you are one, we need to talk. If you know someone who received a mini-grant but has not provided a summary, *we* need to talk.

By happy coincidence, the mini-grant summary (Levine) relates spot-on to the issue's southern New Mexico focus. Indeed, Levine's interview with Stewart Peckham leads off this issue. Also, while the topic of the featured student contribution concerns human forensic biology in a general sense, the author is a graduate of a southern New Mexico institution (Fitzgerald, Eastern New Mexico University).

In addition to Levine's and Fitzgerald's essays, the current issue contains a thought-provoking article by Christopher Mickwee about the importance of survey-level field data for understanding early oil and gas industrial complexes and evaluating their National Register eligibility. An essay by Donald E. Tatum and Matthew J. Barbour about precontact/protohistoric rock features in the Cookes Range includes feature descriptions that are accompanied by beautiful photos. The issue concludes with a richly illustrated and in-depth essay on the Jarilla Site, precontact agriculture, and trade in southern New Mexico by Alexander Kurota, Robert Dello-Russo, Evan Sternberg, and Evan Kay. Thanks to Elsa Delgado-Kurota for the Spanish translation for the title of the issue.

I am grateful to everyone who has shared both their information and their ideas in *NewsMAC*.

And now, to quote Stewart Peckham (see Levine, this issue), let us "go down south and see what that stuff is like."

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Update: *The Making Archaeology Public Video Project*

Lynne Sebastian
SRI Foundation

The New Mexico Making Archaeology Public Project (MAPP) video was completed late last winter. A film crew from Voyageur Media Group, who provided a lot of in-kind labor to the project, spent several days in the vicinity of Albuquerque and Santa Fe last November filming interviews, artifacts, and landscape footage.

In December, all of the collected images were put together, the narrator was recorded, and the background music was added. After several versions were edited by the New Mexico MAPP committee, Voyageur produced the final cut in January 2016. A draft version of the New Mexico production was aired at the Southwest Symposium in Tucson in January while the final cut was being edited.

The final cut was then debuted at the annual Society for American Archaeology meetings in Orlando in April of this year, along with videos from several other states.

The New Mexico video's success would not have been possible without the contributions of NMAC and its members, who provided the funding for the project. New Mexico's video is the only one of the 17 state videos that are complete, or nearly so, to be funded by its own archaeological community. The video's success is also directly a result of the ideas, photos, critiques, and moral support provided by NMAC members.

All of the state videos are hosted on the website of Preservation 50 (preservation50.org), the national clearinghouse for events celebrating the 50th anniversary of the National Historic Preservation Act.

Via the MAPP portal on the Preservation 50 website, you can currently access an introduction and 14 state videos that are housed on a professional Vimeo website (California, Delaware, Idaho, Kentucky, Georgia, Louisiana, Montana, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania, West Virginia, and Wyoming. Three more states are in the late stages of production: Arizona, Michigan, and Washington. The national MAPP steering committee is confident that at least 20 states will produce videos.

In May, I showed the New Mexico video, as well as both the Idaho and Georgia videos, to the Albuquerque Archaeological Society. AAS had assisted the New Mexico MAPP team in selecting the New Mexico video topic, so this was in the nature of a thank you to the AAS members for their help! For those of you who enjoy doing public presentations, all of the MAPP state videos can be downloaded from the MAPP portal on the Preservation 50 website and can be used for any noncommercial educational or outreach purpose.

Thanks again to everyone who supported our New Mexico MAPP video ***Patterns in Time: Big Data as a Window into the Past***.

Filming at sunset along the Rio Grande, November 2015.

INTERVIEWS WITH STEWART L. PECKHAM

Daisy Levine
NMAC Grant Recipient

During 2011 and 2012, when Stew Peckham was 84-85 years old, I conducted a series of interviews with him. I felt it was important to record his stories, memories, and reminisces, particularly about the early days of the Highway Salvage Archaeology Program, before it was too late. I am very grateful to the NMAC mini-grant committee for giving me the full amount of the 2014 grant I requested, which I used to pay a professional transcriber to transcribe my digital interviews into Word documents. I have edited these transcriptions so that most of the focus is on Stew's archaeological memories. These documents are housed at the Laboratory of Anthropology archives, in the care of Diane Bird.

Stew's memory was still remarkable, and he provided numerous details and insights into the good old days of highway archaeology. The interviews, with one exception, are just between me and Stew; Wolky Toll came to Stew's house for one interview session to talk to Stew about the Chuska Valley. The interviews encompass the early years of the Laboratory of Anthropology (LOA), the relationship of the LOA and the Museum of New Mexico, the Highway Salvage Program, the early sites that Stew excavated, the numerous well-known archaeologists that he knew and worked with (such as Florence Hawley Ellis, Emil Haury, and Fred Wendorf), and the Chuska Valley survey.

Stew has been in New Mexico since 1949, and has been involved in New Mexico archaeology and preservation ever since. He is an expert on New Mexico archaeology and southwestern ceramics and has worked with generations of southwestern archaeologists through the years. His contributions are numerous. After graduating from UNM and working at the Point of Pines field school in Arizona, he joined the small staff of the Laboratory of Anthropology in 1954. At that time, Fred Wendorf had just initiated the Highway Salvage Archaeology Program for New Mexico, the first of its kind in the country. Although Wendorf was the visionary behind this innovative program, Stew became the face of highway salvage archaeology. According to Stew, this all came about fortuitously. After his field school, he took a seminar from Florence Ellis on Lehmer's "The Jornada Branch of the Mogollon". This led him to, as he told me, "go down south and see what that stuff is like."

Initially he didn't find much that intrigued him. As he was headed home, it got dark, so he pulled off on the first dirt ranch road he found between Carrizozo and Socorro and rolled out his sleeping bag. The next day, he woke up and found that he was sleeping in a scatter of brownware sherds. This was Taylor Draw, and camping there led to his research and excavation of the site. While he was working there, Wendorf, who was working to the east, stopped by to see Taylor Draw, and the two became acquainted, eventually leading to Stew's job at the LOA.

Working mostly on his own at the LOA for the first seven years, Stew surveyed and excavated in all corners of the state, moving from one locale to another ahead of the bulldozers. Numerous publications resulted from this salvage work, helping to make both the New Mexico Highway Department (now the New Mexico Department of Transportation) and the public aware of New Mexico's rich archaeological heritage (Peckham 1954a, 1954b, 1955, 1961, 1966a, 1966b; Peckham et al. 1956; Peckham and Reed 1963; Peckham and Wells 1967; Peckham and Wilson 1967).

Stew's seminal research in the Chuska Valley in the early 1960s is still the model for work in that area. With Jack Wilson, he conducted the first archaeological research in that region. He documented almost 2000 sites, studied settlement patterns in the Chuska Mountains, and also defined and named a new series of ceramics from the area. These types persist in the archaeological literature today with no change.

Unfortunately, much of this work was never written up. However, during visits to Stew's house, I helped him organize his Chuska files into rough categories, and these are now housed at the Archaeological Records Management Section (ARMS) of the New Mexico Historic Preservation Division. The files contain a large body of information for research and include maps, site descriptions, ceramic descriptions, and ceramic tabulations.

Some of Stew's other major projects include excavation of sites prior to the construction of the Abiquiu and Cochiti Dams in 1961 and 1962, and his research at Puye Ruins and at Santa Clara Pueblo. As well as filling the position of the first highway archaeologist for the Laboratory of Anthropology, Stew also served the Lab as Chief Archaeologist, State Archaeologist, Curator of Collections, and Associate Director. He maintained the site files started by H.P. Mera, the first Curator of Archaeology at the Lab, and saw to the general maintenance of the Lab. He retired from the Museum of New Mexico in 1986 after a career of 32 years.

At the time of this writing in 2016, Stew is living at Brookdale Santa Fe (formerly Ponce de Leon Senior Living). He welcomes visitors and phone calls and still loves to reminisce and talk archaeology.

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VALIDATION STUDY OF A RECENTLY DEVELOPED METHOD OF SEX DETERMINATION ON THE DISTAL HUMERUS

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Forensic science has developed a number of seemingly reliable methods since its inception – especially in regard to the identification of human skeletal remains – to aid law enforcement. Unfortunately, the scientific community is beginning to find that the theories and methods that they have come to depend on are not as reliable as once thought.

Within the last 20 years, advancements in the forensic disciplines have revealed discrepancies in expert witness testimonies that were based on faulty forensic methods and analyses – discrepancies that may have contributed to the wrongful imprisonment of some individuals. As a result, it is extremely important to apply validation tests to any new forensic methods so that they meet the standards established in the Federal Rules of Evidence, Rule 702, regarding the admissibility of forensic evidence and expert witness testimony (28 USC App. Article VII, Rule 702, as amended 2011). Rule 702 requires scientifically sound and unbiased testimony.

In order for any scientific method, theory, or even evidence to be accepted as reliable, it must be subjected to rigorous testing. Many methods in the forensic disciplines have as yet not been tested thoroughly enough to be admissible under what is called the *Daubert Standard* and should be retested in order to become accepted as reliable in a court of law. The *Daubert Standard* is the test applied by all federal and some state trial judges to make a preliminary determination regarding whether an expert witness's scientific testimony is based either on reasoning or on methods considered scientifically valid and if that testimony can be appropriately applied to the facts in a case.

Under the Daubert Standard, factors that may be considered in determining if reasoning or methods are scientifically valid and can be applied to a case are whether the theory or technique in question can be and has been tested, whether it has been subjected to peer review and publication, what its known or potential error rate is, whether standards controlling its operation exist and how those standards are maintained, and whether it has attracted widespread acceptance within the relevant scientific community (Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579; 1993).

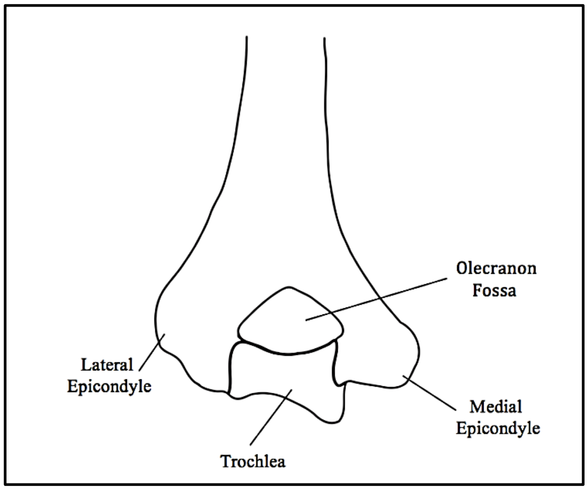

Figure 1. *Location of the four morphological traits on the distal end of the humerus.*

Forensic anthropology uses the study of human remains to answer questions in a medico-legal context. Methods used in the analyses of human remains can reveal crucial information about a person well after they have died. Techniques have been developed to discover the age, ancestry, sex, and stature of the individual, but many of these techniques have not been subjected to blind tests outside of an initial sample, thus their accuracy has not been appropriately demonstrated. One such technique was proposed by Tracy Rogers (1999) to determine the sex of modern-day individuals utilizing four morphological features on the distal end of the humerus. Rogers indicates that her method results in a 92 percent accuracy rate.

My thesis project is a validation study of Roger's method of sex determination. For the project, I examined a large sample of 300 randomly chosen individuals of both black and white ancestry from the Terry Collection housed in the Smithsonian Institute's National Museum of Natural History in Washington, D.C. Rogers' initial study used 35 individuals of white ancestry.

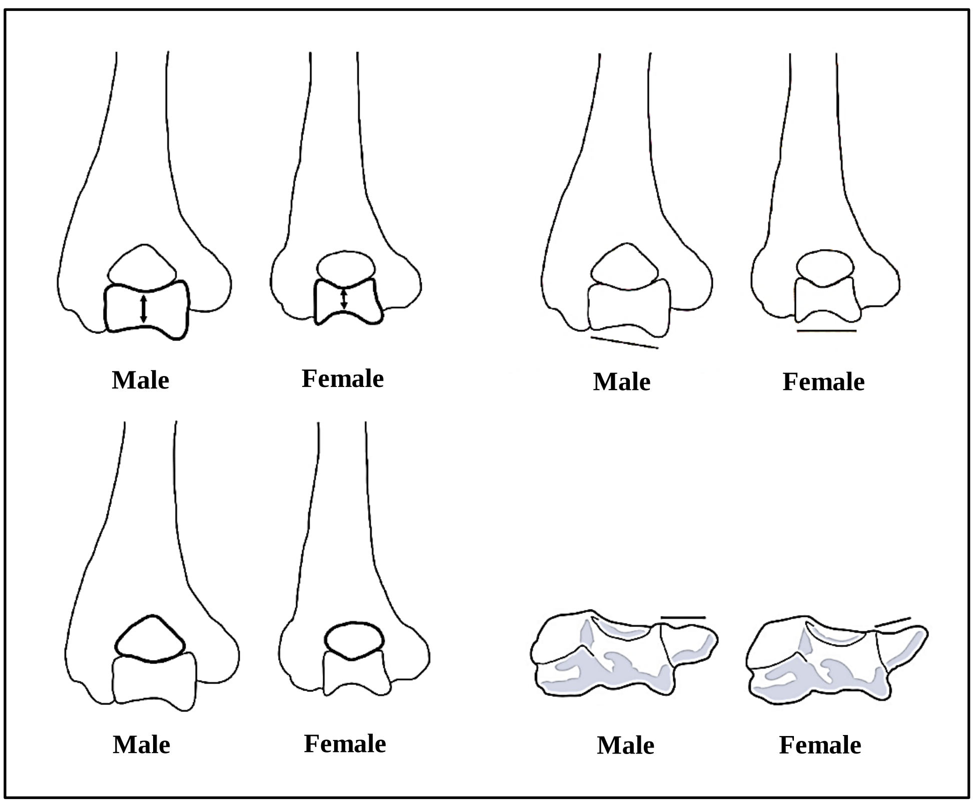

Figure 2. *TOP LEFT: Trochlear constriction, left humerus. TOP RIGHT: Trochlear symmetry, left humerus. BOTTOM LEFT: Olecranon fossa shape and depth, left humerus. BOTTOM RIGHT: end-on view, angle of the medial epicondyle, left humerus (artwork L. Fitzgerald).*

Using the pictures from Rogers' (1999) study and her rules as my frame of reference, I observed the four morphological traits one at a time (Figure 1, Figure 2). For trochlear constriction, I looked at the shape of the trochlea, noting whether the middle looked compressed or squeezed, like a spool, or not. If it did show constriction, a P (for Present) was noted in my analysis table (Table 1). If the trochlea did not show any constriction, an A (for Absent) was put in the table.

For trochlear symmetry, I examined the shape of the feature and I noted the symmetry of the distal, or bottom, edge of the trochlea. If the two edges of the trochlea showed symmetry, I put a P in my analysis table. If the trochlear edges did not show any symmetry, an A was put in the table. I decided to include trochleae that showed near symmetry as being symmetrical; near symmetry occurred where the distal edges of a trochlea were not equal, but varied less than 5.0 mm.

For olecranon fossa shape and depth, I observed the shape of the edge of the fossa, as well as its depth. For the shape of the olecranon fossa, if the edge made a triangular shape, I noted a T in the table. If the edge was an ovoid shape, I noted an O. If another shape was encountered, then a letter corresponding to that particular shape was added. The depth was a little more difficult to observe, so I tried to measure it. However, the results of the measurements were too similar and, unexpectedly, did not assist the determination of depth of the fossa *sensu* Rogers, so the measurements were not included. Trying to replicate Rogers' methods, if I noted that the fossa looked deep, a D was inserted in the table. If the fossa looked shallow, an S was noted.

Lastly, for the angle of the medial epicondyle, I rested the individual humeri on a table and, lowering myself to eye level with each humerus, noted whether the medial epicondyle was straight or angled upwards. If the epicondyle was angled, a P (present) was written into the table. If the epicondyle was straight and not angled upwards, an A (absent) was noted.

Table 1. *Portion of the analysis table for individuals of white ancestry. Codes are: M male, F female, P present, A absent, T triangle, O oval, C circle, D deep, S shallow.*

Data Collection: Smithsonian's National Museum of Natural History: White Sample.

Specimen #	Known age of Individual	Actual Sex	Observed Sex	Trochlear Constriction	Trochlear Symmetry	Olecranon f. Depth/Shape	Angle of Epicondyle
1R	61	F	M	A	A	D/T	P
6RR	69	F	F	P	A	D/O	P
12R	41	F	F	P	A	D/O	P
37R	55	F	F	P	A	D/O	P
41R	41	F	F	P	A	D/O	P
43R	55	F	M	P	A	D/T	P
64R	57	F	M	P	A	S/O	P
69R	52	F	F	P	A	D/O	P
80R	UK	F	F	P	A	D/O	P
112R	59	F	M	A	A	D/T	P
114R	43	F	M	A	A	S/T	P
139R	56	F	M	A	A	S/T	A
161R	50	F	M	P	A	D/T	P
164R	57	F	F	A	A	D/O	P
195	49	M	M	A	A	D/T	P
196	27	M	M	P	A	S/T	A
197R	52	F	F	A	A	D/O	P
207	45	M	M	P	A	D/T	A

My study was designed so that the actual sex of each individual was obscured from me while I was performing the analyses. After the analysis was complete, only then did I examine the record for each individual and log the sex as recorded by the Museum in my analysis table. Next, I calculated the accuracy of my blind observations. My analysis of trochlear constriction, the first of the four morphological features that are visible on the humerus, resulted in an accuracy rate of only 58.76 percent in determining sex – well lower than Rogers' original estimate of 81 percent.

Trochlear symmetry, another of the features, was the least accurate in determining sex, with an accuracy rate of only 48.5 percent. The third trait, Olecranon Fossa shape and depth, resulted in an accuracy rate of 69 percent, lower than the 83 percent rate that was concluded by Rogers' study. The final trait, the angle of the medial epicondyle, I found to be the most accurate morphological trait, with a 79 percent accuracy rate for determining sex. The total accuracy rate across all four morphological features obtained for this validation study, however, is substantially lower at 65 percent than that of the original study, which claims 92 percent accuracy (Rogers 1999).

A chi-square analysis was also performed for each of the four morphological traits, and the chi-square values obtained were much higher than the critical value for each test, indicating that, for each trait, the results were significantly different than the 50/50 chance of guessing the sex of each individual. However, the chi-square results do not mean that the method is valid. In at least six cases of separate sex and ancestry groups, the results from this study were significantly worse than those that would be obtained from guessing.

It appears from my study that the sex determination method tested could be made more accurate by converting it to a metric method instead of an observational method. Accuracy between analysts is difficult to maintain with observational methods, because their applications are too subjective. Without specific measurement protocols, it is difficult to replicate a method and obtain the same results among different researchers. It is clear that the observations Rogers made while developing the method are different from the observations made during the current validation study. For instance, determining if the depth of the olecranon fossa was "shallow", without metric guidelines for what constituted a shallow depth, made it difficult to replicate what Rogers may have seen as shallow.

Conversion of this observational method into a metric method would be beneficial not just for the researcher, but for the validity of the method. Once metric-sectioning points could be determined and tested for each of the traits, this method could potentially also be applied to prehistoric populations. Often, archaeological pelves and skulls may be either missing or in poor condition, and this method, which relies on one of the long bones, could be imminently practical for determining the sex of prehistoric individuals. Long bones frequently stay intact after burial, and even when pelves and skulls are available, having multiple methods of sex determination at one's disposal would be ideal.

The results of this validation study did not support Rogers' original findings regarding the method's accuracy. Instead the study showed that her method of determining sex using observations of traits visible on the distal humerus would not meet the *Daubert Standard* or be applicable under Rule 702. The study did, however, determine that converting the observational method to a metric method appears to be possible, in which case it would be useful not only in a legal forensic context because it would be standardized and achieve higher rates of accuracy, but also in an archaeological context.

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THE PECOS DIAMOND OIL REFINERY: A SMALL-SCALE, HISTORIC OIL REFINERY IN SOUTHEASTERN NEW MEXICO

Christopher L. Mickwee
Boone Archaeological Resource Consultants, LLC

Introduction

The oil and gas industry of southeastern New Mexico arose during the 1920s and 1930s and became an integral part of the local economy. Little is known about the early years of oil and gas in the region, particularly the peripheral, small-scale operations.

The importance of establishing the significance of and preserving industrial archaeological sites dating to this formative time cannot be overstated. As groups of workers and their families often lived within oil and gas industry complexes, such sites provide multiscalar data pertaining to family and community life, as well as local, regional, and even national economic history. Extensive, contemporary oil and gas development in the region now has the potential to destroy these data.

Given a nearly universal absence of substantial historical documentation about the industry, surveys conducted ahead of development represent one of the only opportunities to assess early industrial lifeways. It is therefore increasingly important to establish the historic context and potential significance of early oil and gas sites in southeastern New Mexico using survey-level archaeological data.

A cultural resources survey conducted in June 2015 for four proposed oil wells for LRE Operating, LLC, in Eddy County, New Mexico, provides just such a case study. During that survey, a previously recorded, small-scale industrial site – the Pecos Diamond Oil Refinery (LA 102896) – was recorded and assessed.

This article presents the archival research results and archaeological data from that survey to articulate both historic context and site use. Using that survey-level information, the article also assesses the historical significance of this early industrial site in southeast New Mexico.

The Pecos Diamond Oil Refinery

The Pecos Diamond Oil Refinery consists of the remnants of an early refining operation and "pumping station". The Refinery site includes several standing structural/mechanical features and a large artifact scatter with multiple concentrations.

The site, LA 102896, is situated in eroded gypsum soils on a ridge 1.8 mi east of the Pecos River. It was originally recorded in January of 1994 by Acklen et al. (1994), in advance of a large seismic project. Subsequent surveys were conducted by Wilcox (1996), D. Boone (2002), A. Boone (2005), Smith (2006), Rorex and Sanders (2009), Walley (2012, 2014), and Rein (2014).

Limited archival research was conducted during the 2015 survey for the four LRE Operating wells to determine the context and use of the site within local history (Hill and Mickwee 2015). Original research conducted by Acklen et al. (1994) included an informant interview that identified LA 102896 as the location of the former Pecos Diamond Oil Refinery. The informant, Bill Gissler, stated that the refinery operated sometime in the 1920s and was "one of the first" in the area.

In addition, Acklen et al. (1994) suggested that the presence of purple glass meant the site had been in use before WWI. Rein (2014) cited unreferenced chronometric data, archival data, and Bill Gissler's statement, to assign an "Anglo/ Euro-American US Territorial to Recent" cultural/ temporal affiliation (AD 1900 to 1995).

Prior to the research discussed in this article, then, very little in the way of definitive, chronological data had been collected. The Pecos Diamond Oil Refinery research associated with the archival and archaeological survey data presented here was conducted by Hill and Mickwee (2015). In addition to piece-plotting all surface artifacts and standing structural/ mechanical features associated with the Refinery, a records search also was conducted to better define both the industrial function of the site and its place within a local historical context.

Archival Research

Archival information about the Pecos Diamond Oil Refinery is both limited and conflicting. Some sources corroborate the informant interview initially referenced in Acklen et al. 1994. A letter written and submitted by Mrs. Lawrence Godell, on file at the University of Wyoming Library, states that "A small refinery, the Pecos Diamond Refinery, was also built in the oil field area. The first pipeline into Artesia from the field was built by Yates in 1925" (Waltrip and Waltrip 1979).

An article entitled "Refining Operations Existed for Less than a Decade" in an issue of the *Carlsbad Current-Argus* dated May 19, 2002, states that the "Pecos Diamond Refining Co. was started by George Grober about 1925 and is on the Compton oil lease. It was shut down circa 1933" (Cranston 2002). Although these sources cite 1925 as the first year of the Pecos Diamond Refinery's operations, they are secondary sources based primarily on informant accounts.

Hill and Mickwee's (2015) review of archived newspaper materials discovered an article entitled "The Pecos Diamond Refining Co. to Start Operations Soon" in an issue of the *Artesia Advocate* dated March 26, 1931. The *Artesia Advocate* article states:

> The Pecos Diamond Refining Co. expects to start refining operations within the next few days, it was announced here yesterday. G. A. Grober, president of the refinery… returned the first of the week and final details connected with the starting of the plant are now being worked out. Finishing touches to the plant are going forward rapidly and it is hoped that the refinery may be operated without interruption, once the oil runs are started… The Pecos Diamond Refining Co. plant is located on the Compton oil lease, about 10 miles southeast of here [Artesia].

As the *Artesia Advocate* article is dated March of 1931, it is implied that the beginning of the Pecos Diamond Refinery operations did not start until at least March of that year. Further, a BLM lease case file for lease number 007714, where the refinery footprint is located, indicates that the initial case for the lease was established on May 15, 1931 (BLM/CFO 2015). Thus, two 1931 archival sources indicate that the Pecos Diamond Refinery did not start operations until the spring of 1931. This date, when compared to the relative chronology of other local oil refineries, allows for a more informed evaluation of LA 102896's place in time and its National Register of Historic Places eligibility.

In 1924, prior to the construction of refineries in the area, oil from the Artesia field was shipped to other towns such as Albuquerque, El Paso, and Roswell (Waltrip and Waltrip 1979). The Sullivan Refinery had been built in Dayton, New Mexico, 8 mi south of Artesia (Hopkins 2000; Waltrip and Waltrip 1979), but after approaches to the Refinery were washed out during a storm in 1925, it was shut down. Also in 1925, the first refinery in the town of Artesia was built on the north bank of Eagle Draw (Waltrip and Waltrip 1979).

The *Carlsbad Current-Argus* article from 2002, previously mentioned, also references a Phillips Plant Refinery, supposedly built in 1925 somewhere in the area; however, the accuracy of this date is uncertain, given that the article provides a likely erroneous start date for the Pecos Diamond Refinery (Cranston 2002). The Pecos Diamond Refinery was then built in early 1931, according to sources cited above, and the Malco Refinery was constructed directly south of the plant on Eagle Draw during the later months of that same year.

The Pecos Diamond Refinery supposedly shut down in 1939, eight years after operations began (Waltrip and Waltrip 1979). An Artesia community pamphlet dated that same year indicates that another refinery, the Universal Refinery, was already in operation by this time (personal communication, Dunn 2015). The Nu-Mex Refinery was also constructed in 1939, and the refinery that would become the present-day Navajo Refinery was built in 1953 in Artesia (Hopkins 2000; Sherrell 1989; Waltrip and Waltrip 1979).

Given the history of refineries in the area, the Pecos Diamond Refinery could have been anywhere from the third to the fifth refinery constructed near Artesia. Although refinery operations were already underway in Roswell, Albuquerque, and El Paso before any refineries were constructed in Artesia (Waltrip and Waltrip 1979), it is clear that the Pecos Diamond Refinery was indeed "one of the first" in the area. Thus, the refinery likely was instrumental in the early development of the local industrial economy.

In addition to the refining operations that took place at LA 102896, the presence of a "pumping station" – represented by an eccentric gear feature and at least six plugged and abandoned wells in the immediate site area – demonstrates that early-to-mid-20th-century pumping operations were also undertaken. Although the relationship between the refining and pumping operations are not certain, several lines of indirect evidence suggest that they were likely conducted contemporaneously. The previously mentioned *Carlsbad Current-Argus* article from 2002 states that an informant, Jack McCaw, remembered seeing the Pecos Diamond Refinery as a child, when it was in operation. McCaw stated:

> Crude oil was boiled and refined into gasoline, and cables were going in every direction to each well in the field with a concentric operation called a rod line-pumping unit. A National motor powered by natural gas ran the operation.

Further, the "pumping station" is surrounded by six capped "Brainard" wells, one of the well caps (Brainard #3) is inscribed with a date indicating when the well was abandoned. The inscription "H. R. 1952" is written in the cement of the cap. A review of the BLM lease case file shows a gap in activity from the effective date of May 15, 1931, to a renewal date of 1961 (BLM/CFO 2015).

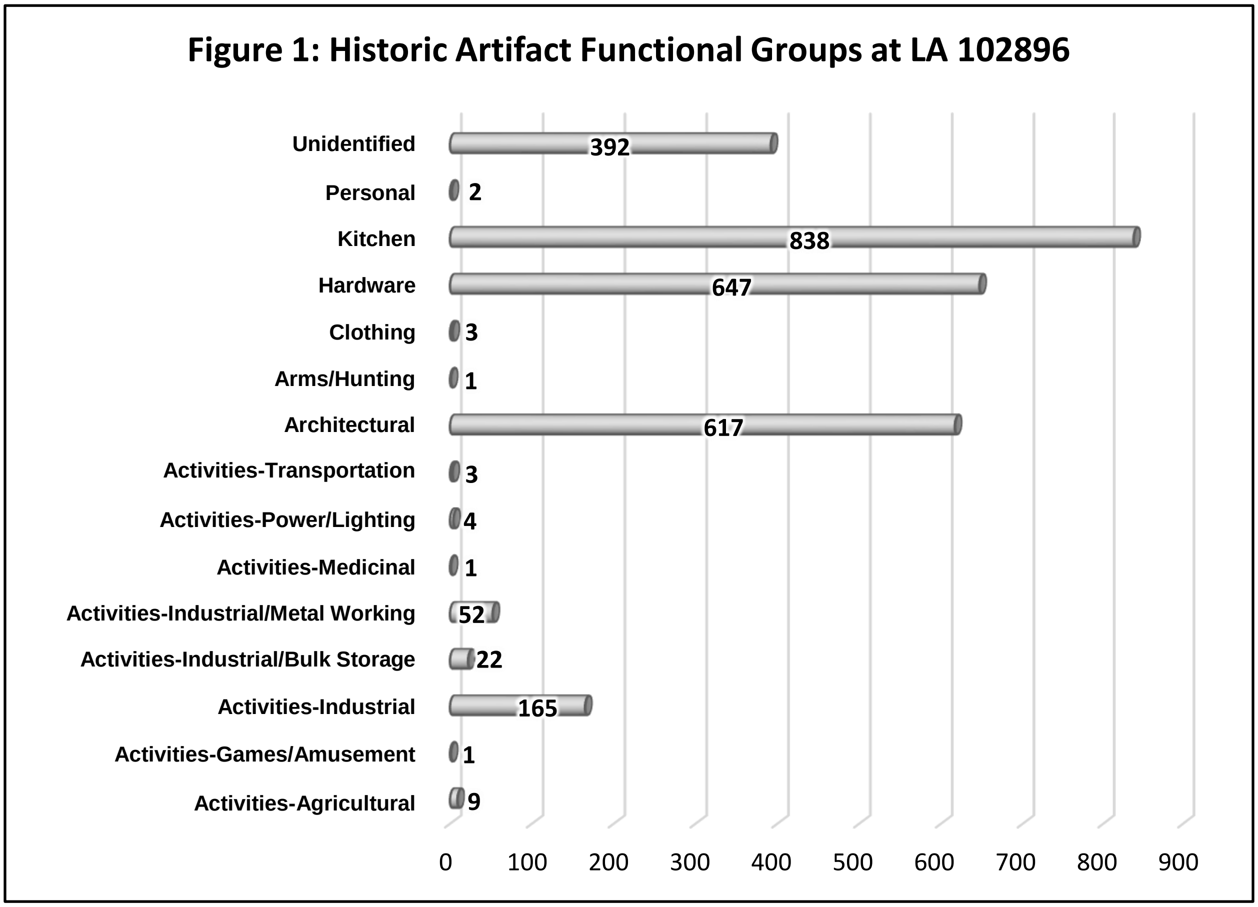
As Brainard #3 was capped nine years before any additional activities were recorded for the lease, it is likely that these wells were being pumped via the "pumping station" by the same organization that leased the lot and built the Pecos Diamond Refinery. This scenario would corroborate McCaw's recollection of both the operations running simultaneously and further suggests that the Brainard wells, and perhaps the "pumping station," outlasted the eight-year lifespan of the refinery. Thus, although the Pecos Diamond Refinery itself was short-lived, the use of the site and its role in the economic history of the area continued long after the refinery ceased operations.

Artifact Assemblage

The artifact assemblage of the site is varied and extensive. It is comprised of approximately 50,000 artifacts from many different functional categories (Figure 1). Some of these materials relate to mid-to-late-20th-century disturbances associated with the modern oil and gas industry.

However, the majority of the assemblage is likely associated with the early 20th-century pumping and refining operation. Categorization of artifacts recorded at the site was based loosely on South's (1977) functional classification system (Figure 1). This type of functional artifact analysis allows for the interpretation and clear discussion of behavioral patterns reflected in the site assemblage.

Figure 1. *Historic Artifact Functional Groups at LA 102896.*



Although information in the historical record regarding details of the Pecos Diamond Refinery's day-to-day operations is absent, archaeological evidence indicates that workers were living very near or on the facility. Given the isolated nature of oil fields and refineries in the early part of the 20th century, it was not uncommon for workers to live in very close proximity to facilities such as the Pecos Diamond Refinery. As the functional artifact analysis reveals, the majority of refuse recorded at LA 102896 is domestic in nature (Figure 1) and most is demonstrably contemporaneous with refinery operations, as discussed further below. In addition, the presence of toys in the assemblage suggests that the site had a demographic component that included families with children.

No direct evidence for the former locations of houses has been found; however, discard patterns reveal that the western edge of the site was used for trash disposal. The concentration of kitchen refuse features along the western slope suggests that either people were residing near the western edge of the site, chose to discard trash out of sight and away from (west of) homes and refinery operations, or both. "Kitchen features" were dense concentrations of refuse as if from a trash pit, but without any subsurface context.

It is possible that some of the refuse postdates the original period of site use and could have resulted from dumping by groups dwelling much further away, but this is less likely. The configuration of the kitchen features – relative to industrial features and the old oil found mixed within them – indicate that they are contemporaneous. Industrial features included, but are not limited to: fire boxes, the pumping station footprint with its intact eccentric gear system, razed building debris piles, storage tank bases, industrial artifact concentrations, recessed concrete structures, and oil reservoirs.

Temporally diagnostic glass and ceramic artifacts from the site assemblage further support the possibility that refinery workers lived on or very near the site. Manufacture and common use dates for these domestic artifacts closely match the Pecos Diamond Oil Refinery operation dates. Three Owens Illinois Glass Co. marks were identified on glass containers at the site. Two were recovered from the general scatter area, one of which was manufactured between 1936 and 1946 and the other of which was manufactured in 1939. The third Owens mark, recorded in a refuse feature, indicates manufacture between 1935 and 1945 (Lockhart 2006). In addition, pieces of purple and yellow glass were recorded both in the general scatter and within features. Purple glass was manufactured between ca. 1885-1920, and yellow glass from ca. 1918 into the 1920s (Horn 2008).

Bristol glaze salt-glazed stoneware, also recorded in the general scatter, has a manufacture date from 1835-1900 (Hume 2001). Fiesta ceramics ("Fiestaware"), recorded as part of the assemblage in a refuse feature, have been manufactured since 1936 (Zimler 1986). Therefore, all diagnostic, domestic artifacts reasonably fall around the time that the refinery was in operation, from 1931 to 1939.

Further corroboration of the dates of site use is found in the ratio of wire (round) nails to cut (square) nails. The transition from cut nails to wire nails took place between the 1880s and the early 1900s. By 1913, 95 percent of the nails at any given site typically are wire nails (Horn 2008). Including estimated counts and feature contents, 94.9 percent of the nails recovered from the Pecos Diamond Oil Refinery are wire nails, meaning that the assemblage is similar to others dating to the early 20th century.

Assessment and Conclusions

The archival and archaeological data suggest that the Refinery was a small-scale, short-duration, refining and pumping operation with a domestic component dating to the early 20th century. The deposits and features at the site could provide further data regarding domestic and industrial life during the nascent stage of development of southeastern New Mexico's oil and gas industry. The site was therefore recommended as eligible for the National Register of Historic Places and was officially determined to be eligible in 2015 by the New Mexico State Historic Preservation Office.

These investigations provide an example of how basic archival research and survey-level archaeological data can indeed facilitate adequate interpretations for assessing the historical significance of early industrial sites. As sites relating to early industrial development in southeastern New Mexico may reveal nuances of lifeways that are not otherwise reflected in traditional historical records, a greater effort should be made to preserve and interpret these sites in the wake of contemporary development.

Acknowledgements: Special thanks to Nancy Dunn and the staff of the Artesia Historical Museum and Arts Center for their initial research of the history of local refineries and their willingness to facilitate the research needs of local archaeologists.

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Huts & Ring Middens: Protohistoric Hunter & Gatherer Features in the Cookes Range

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In 2011, the Department of Cultural Affairs Office of Archaeological Studies completed a large archaeological survey on behalf of the New Mexico Abandoned Mine Land Program. The roughly 4,500 acres surveyed are in the Cookes Range, northeast of Deming, New Mexico. During the survey, 30 archaeological sites were recorded, and more than 2,000 archaeological features were documented. Two feature types in particular found in the survey area are emblematic of mobile hunter and gatherer groups who occupied the area after the collapse of Mimbres culture (ca. AD 1450): rock-ringed huts and burned rock ring middens.

Rock-Ringed Huts

Rock-ringed and slab-ringed huts are described in the historic literature by early Spanish explorers and U.S. military personnel. These shelters were often attributed to the Apache and other hunting and gathering groups, such as the Manso, who lived in the Chihuahua and Sonoran deserts. Often these features are described as being located on prominent, high-elevation ridge lines that afford sweeping views of the desert below Figure 1).

One of the hut structures found during the Cookes Range Survey was located near a rock-walled hunting blind. The blind was perched on the edge of an extensive cliff band bordering the northern and western sides of a ridge locally referred to as Quartzite Rim (Figure 2). The hut was situated approximately 5 m behind the blind. The hut was represented by a circular depression 2 m in diameter and 40 cm deep. The size and shape of the feature matches similar structures found elsewhere in southern New Mexico.

The circular depression probably functioned as the floor of the expedient shelter. Jose Cortès y de Olarte (1799), a lieutenant in the Royal Corps of Engineers, described "rock ringed huts" with flat or slightly depressed floors. The floors are often devoid of rocks unless they are severely eroded or have bedrock or boulders exposed from beneath. These shelters had a superstructure with an animal hide or brush covering.

Another, somewhat more elaborately constructed shelter was discovered farther east, near the upper end of the ridge. This stone-walled structure is roughly 4.5 m in diameter, with an opening on the east side. The walls are stacked tabular quartzite sandstone slabs. Three walls have collapsed, obscuring the original geometry of the structure, which was roughly square or circular. The interior floor space is from 2-3 m in diameter, is flatter than the ground surface outside the walls, and appears to have been cleared of rocky detritus during construction. Four flaked stone choppers (two made of basalt and two made of chert) were discovered immediately outside of the structure.

Figure 1. *Possible rock-ringed hut (photo courtesy of the Office of Archaeological Studies).*

This more elaborate shelter resembles a variation on the slab-ringed hut described by Deni Seymour (2004), in which stacked cobbles, boulders, and slabs circle the perimeter, defining its border. The entry is indicated by an opening in the wall; the floor space is a flat or slightly depressed clearing.

The superstructure of both dwellings presumably consisted of a circular brush frame covered with hides that may have been weighted by the peripheral slabs, boulders, and cobbles. Considering the construction techniques, relatively small size of the structures, and their inconspicuous location at the very edge of Quartzite Rim, a Protohistoric Native American – probably Apache – origin seems likely.

Figure 2. *Clark Draw hunting blind (photo courtesy of the Office of Archaeological Studies).*

Burned Rock Ring Middens

The term "ring midden" or "midden circle" refers to a ring-shaped burned rock deposit surrounding a roasting pit. These features are formed during the process of roasting hearts of mescal or sotol plants. The process involves digging a large pit, preparing a fire, placing the hearts in the coals, and covering them with rocks. After the hearts roast for several hours, the rocks are removed and cast away in a circular arrangement around the pit.

Over time, the process results in a large, heaping donut-shaped arrangement of burned rock surrounding a depression where the central roasting pit was located (Figure 3). The use of roasting features resulting in the development of burned rock middens, including midden circles, has been ethnographically and archaeologically associated with various groups, including the Mescalero and Chiricahua, many of whom continue the practice into the present day.

One such very large midden circle was associated with the slab-ringed structure discussed above. This particular ring midden was unusual in that it consisted of two adjacent ring middens that had merged into one large burned rock feature, known as a compound ring midden. Over time, the discard stones from the two features merge together, creating an irregular rectangular or oblong perimeter. The compound burned rock discard pile measured 11.5 m north-south by 9 m east-west. Two depressions in the discard pile indicate the central hearths of the middens in which the cooking took place. The smaller, shallower, higher depression in the south side of the midden represents the older, roasting area, abandoned when the newer midden circle began to superimpose.

Figure 3. *Ring midden on Quartzite Rim (photo courtesy of the Office of Archaeological Studies).*

Conclusion

Both the rock-ringed structures and ring midden features found on Quartzite Rim and elsewhere within the Cookes Range suggest a substantial Native American presence during the proto historic and early historic time periods (ca. AD 1450-1800). Several tribes, including the White Mountain and Fort Sill Apache, claim to have once lived and hunted in the Cookes Range area. Examination of these features represents a first step towards locating possible ancestral sites associated with these two groups and understanding the types of activities these groups engaged in while living in the area.

A lengthy technical report entitled *In the Shadow of Standing Mountain: An Archaeological Survey of the Northern Portion of the Cookes Range, Luna County, New Mexico (Barbour et al.)* was published in 2014. This report not only details protohistoric and historic period use of the Cookes Range by Native American peoples, but also documents the large Euroamerican mining communities of Cooks Town (LA50096), José Town (LA50090), and Hadley Town (LA 172093). Download the public friendly version of the report at: www.nmarchaeology.org or contact the Office of Archaeological Studies publication department at lynne.arany@state.nm.us.

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A similar version of this article appears in the museum of New Mexico Foundation's *Friends of Archaeology* newsletter, May 2012.

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The Jarilla Site, LA 37470: A Prehistoric Outpost for Agriculture and its Possible Role in Regional Trade

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In the spring and fall of 2015, the Office of Contract Archeology, University of New Mexico (OCA) performed test excavations at archaeological site LA 37470. The site is located on the southern alluvial fan of the Jarilla Mountains and it lies along the eastern boundary of White Sands Missile Range (WSMR). LA 37470 was originally documented in 1983 and, over the past three decades, the site was subjected to severe erosional processes.Therefore, WSMR Stewardship Archaeologist Dr. Stanley Berryman tasked OCA with evaluating the effects of that erosion and the site's research potential.

Our work culminated in the discovery of a series of agricultural check dams and grid gardens associated with simple fieldhouses. This type of a prehistoric farming locus has so far been described only in a few parts of southern New Mexico and has been virtually lacking in the archaeological literature for the Tularosa Basin region. Our continuing investigation of the LA 37470 features and its extensive artifact assemblage reveals that the site was a residential locus which produced significant maize yields and may have played a role in prehistoric trading and commerce.

After resurveying the site limits, the OCA field crew realized that many more cultural resources would have to be added to the site's single previously documented thermal feature. A large number of ash stains, concentrations of burned rock, and various rock alignments and rock enclosures were encountered throughout the site area. The site's total feature count reached over 160. While most of the features were thermal pits, sometimes mixed with fire-cracked rock, others consisted of rock alignments and rock enclosures that were made of unburned rocks.

Our analysis of the features suggests that most of them were associated with agricultural activities (Figure 1). We interpret the numerous rock alignments and enclosures to be a system of runoff farming terraces, an arrangement that appears to closely resemble a similar system used widely in the Mimbres Valley.

While some of the site's projectile points indicate sporadic visits during the Paleoindian and Archaic periods, the most intensive occupation appears to have taken place during the Doña Ana phase of the Jornada Mogollon period. A close association with Mimbres populations is inferred by high frequencies of Mimbres Black-on-white and utility wares at the site. Over 100 thermal features, six middens, and at least two pithouses also reflect the food processing and residential activities that occurred at the Jarilla Site. One of the pithouses could have served as a large community structure. These are described at length in the following section.

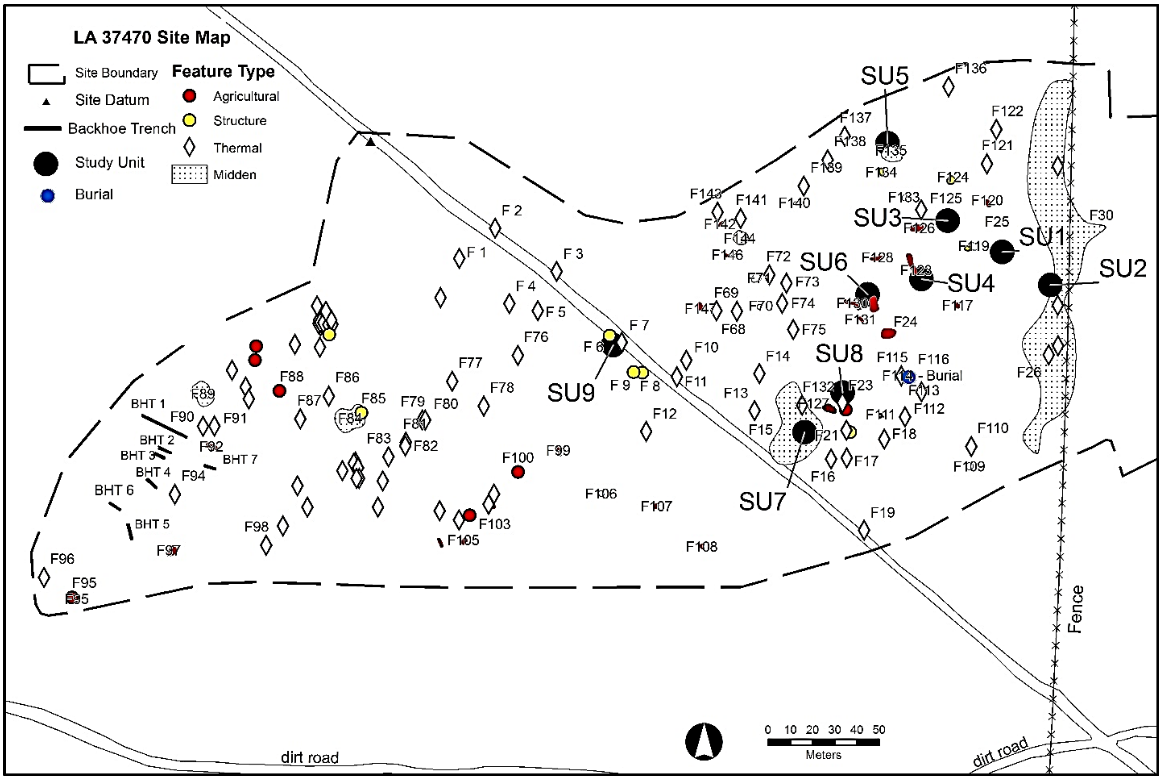

Figure 1. *Map of Jarilla Site with documented features.*

The Jarilla Site

In all, 162 features so far have been documented at the site. These include two pithouses, six middens, 19 check dams, 13 grid gardens, 10 fieldhouses, and one human burial, while the rest are ash stains with or without the association of fire-cracked rock. The site also has a first-half of the 20th century historic component associated with a masonry structure foundation and an artifact scatter. OCA test-excavated 16 of the features to evaluate their nature and obtain samples for both macrobotanical analysis and radiocarbon dating. Interestingly, while the Mimbres Style II and Style III ceramics indicate an Early Doña Ana phase occupation, three of the four chronometric dates place the site in the AD 1170 – 1280-time span, or a Late Doña Ana/Early El Paso phase occupation.

Agricultural Features

In all, 32 agricultural features (in addition to field houses) were identified at LA 37470 and were interpreted as part of an opportunistic irrigation-and-terrace agricultural adaptation. The agri-cultural features include 19 rock alignments, identified as check dams, and 13 rock enclosures that have been interpreted as grid gardens. Both types of agricultural features occur across the entire site and are strongly associated with shallow drainages that dissect the terrain.

Check Dams The check dam features are typified by linear rock alignments that were set perpendicular to existing drainages, and often across them, although alluvial processes have disrupted several of the alignments (Figure 2). This suggests that the dams would have required a certain amount of maintenance and may have incorporated smaller cobbles and perishable materials that did not survive in the archaeological record.

The check dams range in length from a mere 60 cm to a particularly massive example measuring 10 m in length and crossing two drainages. The check dams are composed of locally available igneous cobbles and boulders (mostly monzonites and syenites).

These features would have been used in conjunction with grid gardens to slow and divert runoff, decreasing the energy of the flow to promote water retention and sedimentation and potentially diverting water into channels to feed grid gardens. This would have offered the benefit of both increasing the amount of water available for current crops and improving the nutritional quality of the soil.

a **b**

Figure 2. *Examples of check dams at the Jarilla Site: (a) rock pile indicating a disturbed check dam next to a shallow drainage, view west; (b) three disturbed check dams placed strategically about 5 m apart along a single drainage, Jarilla Mountains are in background, view north.*

Grid Gardens The 13 grid gardens seem to possess a particular suite of locational and morphological characteristics that differentiate them from other rock enclosure structures (fieldhouses) and fire-cracked rock concentrations. For example, far fewer cultural materials typically are directly associated with the grid gardens. Like the check dams, they were made of locally available igneous cobbles and boulders that are typically not fire-cracked.

The grid gardens are usually associated with drainages, sometime with nearby check dams. They consist of one or more conjoined enclosures, each grid measuring around 1.5 by 1.5 m. Two types of grid gardens were noted: the first, built adjacent to a drainage, with its long axis most often parallel to the drainage (Figures 3a and b). These are surmised to have been fed by small channels dug by the inhabitants of the Jarilla Site, although no evidence for such channels has been documented to date.

The second grid garden type has its long axis across a drainage and so would have been fed directly by the intermittently available water (Figure 3c and d). While the first type of enclosure usually consisted of only two, perhaps three, grids and measured 3-4 m, the second type was usually larger, consisted of multiple grids, and spanned from 6 m to over 15 m. Other evidence suggests that similar grid gardens were used by Mimbres people (Figure 3e; see also Shafer 2003:130).

It should be noted, that most of the agricultural features at the Jarilla Site have been disturbed to a lesser or greater degree by wind and water erosion, which has resulted in the displacement of rocks and has ultimately disfigured the overall shape and size of the features. This displacement has often made it difficult to distinguish the exact shape, size and, thus, the original function of many of the features. For this reason, some of our interpretations might be taken with caution.

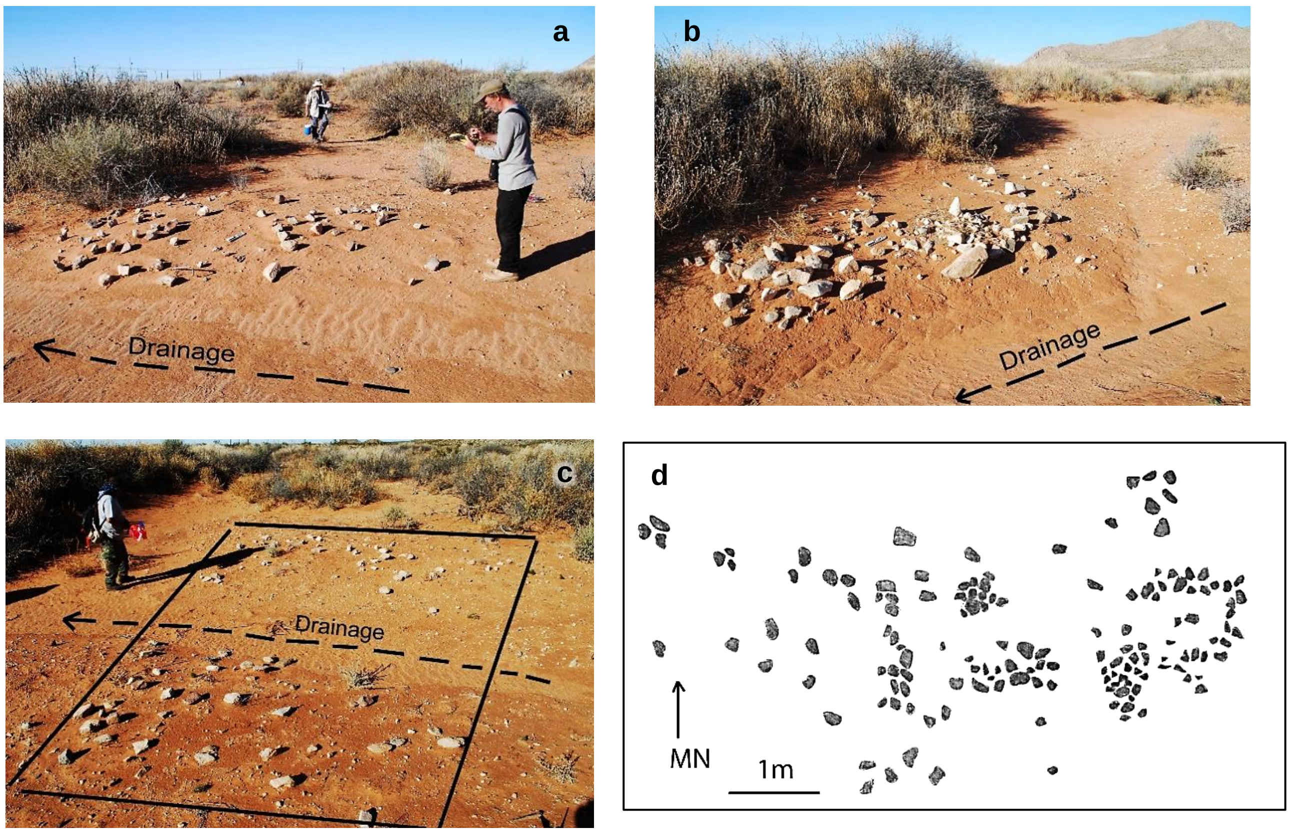

Figure 3. *Examples of agricultural grid gardens at the Jarilla Site: (a, b) partially disturbed two-grid gardens, each on west side of a shallow drainage, both views are west; (c) partially disturbed grid garden placed perpendicular to drainage, view west; (d) sketch of a 6+ grids garden; and (e) reproduction of a Mimbres Black-on-white Style III motif from a ceramic bowl depicting prehistoric farmers tending crops (probably maize) within a grid garden; original illustration by Karen Gardner (Shafer 2003:130, Figure 7.10a), permission from University of New Mexico Press*

Fieldhouses

Ten rock enclosures at the Jarilla Site are identified as small fieldhouses, constructed of locally available rock. They share several characteristics that differen-tiate them from agricultural or thermal features. Unlike the burned rock thermal features, the field houses were built mostly of natural, unburned rocks. The rock clasts were likely used to help anchor wood posts into the ground to create superstructures for shade or ramadas. While some structures were completely outlined with rocks (Figure 4a), others were laid out with merely four cobbles, one for each of the corners (Figure 4b).

At least one hammerstone was noted inside, or in proximity to, each fieldhouse. Yet, because few pieces of lithic debitage were found nearby, it is hypothesized the hammerstones were used as pounding implements to aid in the construction of the ramadas or to process agricultural produce. The fieldhouses are often associated with thermal features and occasionally with small middens. The presence of thermal features inside some of the fieldhouses points to possible cooking activities. The single-roomed fieldhouses are spread across the site and have uniformly small (80-150 cm across) interiors.

a **b**

Figure 4. *Examples of fieldhouse structures from the Jarilla Site: (a) partially displaced rocks representing a field house near a collapsed power line post; note the ash stain in the interior of the feature; (b) square-shaped rock enclosure with cobbles at the four corners and a hammerstone (indicated by white arrow) in its interior, view northeast.*

Pithouses

Two sizeable pitstructures were uncovered during the test excavations. The first one, Feature 156, was discovered in a backhoe trench in the southwestern corner of the site and has an east-oriented, 2-m-long entry ramp. Excluding the ramp, the structure was about 3.5 m long east-west, had a large hearth, and was filled with trash deposits. Its north-south dimension remains unknown, as the structure was not fully exposed.

The second pithouse, Feature 153, was a large, rectangular dwelling estimated to measure 5 by 7 m, with its long axis running in an east-west direction. Located in the central portion of the site, this pithouse had two superimposed floors, with the lower one reaching 90 cm beneath the modern ground surface. The test-excavated portion of the structure also revealed a raised upper floor surface that appeared to encompass the center of the structure. It is possible that the raised portion may have served as a bench-like feature. The possible bench, along with the structure's size and depth, suggests a possible communal or ceremonial function for the structure. A small, raised platform along the eastern edge of the feature may have served as the entry. Two distinct layers of trash were found in the post-occupational fill of the structure, suggesting that the site was occupied during at least two separate times after Feature 153 had been abandoned (Figure 5).

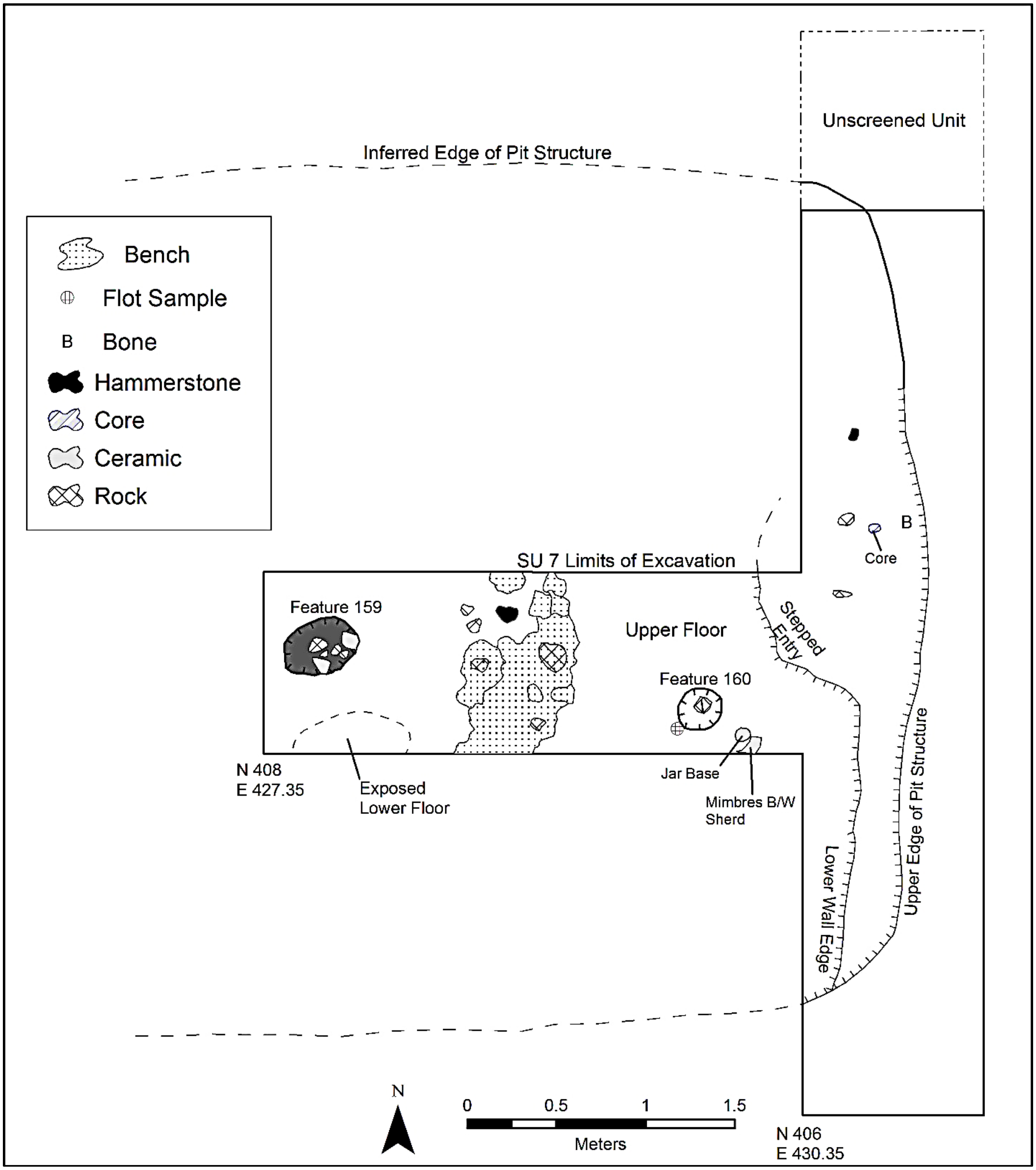

Figure 5. *Plan view map of pithouse, Feature 153.*

Two ash stains in the northern part of the site near midden Feature 135 have tentatively been identified as additional burned pithouses. They are each about 3 m in length, and contain ashy sediments, ceramics, and lithics. Their size and artifact content distinguish them from smaller ash stains interpreted as possible hearths. Additionally, these two potential burned pithouse features did not reveal fire-cracked rock, which indicates that they are not middens.

Middens

Six middens were documented at LA 37470, and two of these were tested. The middens varied widely in size from 6 m to over 50 m in length. They are characterized primarily by relatively high densities of artifacts. All have ash or charcoal staining, as well as high volumes of flaked lithics, ceramics, groundstone, fire-cracked rock, and burned faunal remains. Based on the high frequency of ceramics associated with the middens, they all appear to have been associated with the site's Jornada Mogollon component.

Thermal Features

By far the most common type of features recorded at the Jarilla Site are thermal features. These were identified by the presence of charcoal-stained sediments, fire-cracked rock, or both, and have widely ranging sizes from 20-cm stains to 5-m fire-cracked rock concentrations. While some of these are associated with structures, others are scattered across the site. The thermal features usually appeared on the surface as ash stains that ranged in size from 20-200 cm, with fewer than 35 fire-cracked rocks within each feature. One of the larger stains, Feature 148, was test-excavated (Figure 6a) and produced a radiocarbon date of Cal AD 1170-1260 (International Chemical Analysis, Inc. Lab No. 15C/1213).

The smaller ash stains are more common at the site and were probably associated with the Jornada Mogollon occupation. These features are interpreted as possible hearths, however some may have been ash dumps, middens, or even structures. A cluster of up to nine stains, each measuring about 30-60 cm in diameter, and covering an area of nearly 5 m in diameter, was found in the southwestern part of the site. This cluster could represent an intensive activity locale (Figure 6b). The fire-cracked rock concentration features tend to be larger than the simple ash stains, ranging from 40-500 cm across and containing from 8-300 pieces of fire-cracked rock.

Human Burial.

Previous reconnaissance of the Jarilla Site had identified a human interment (Kurota 2015). The burial was eroding out of the modern ground surface in the east-central portion of the site and included the remains of a small child not older than 6-7 years. Several human teeth and bone fragments were identified at that time, along with an El Paso Bichrome jar rim fragment placed over the head area. This is reminiscent of the "killed pots" found in Mimbres Mogollon burials, except that the jar fragment did not reveal any kill hole.

a **b**

Figure 6. *Ash stain features at the Jarilla Site: (a) Profile overview of Feature 148; (b) concentration of nine small ash stain features (highlighted by dashed lines) covering an area of 5 m in diameter.*

Prehistoric Agricultural Sites in Southern New Mexico

Much has been learned about prehistoric agricultural practices in northern and central New Mexico. A great variety of check dams, grid gardens, cobble mulch piles, waffle gardens, and irrigation canals have been documented over the past century of archaeological research (Anschuetz 2007; Doleman and Brown 2000; Galassini 2005; Gerow and Doleman 2002; Gerow and Hogan 2005; Gerow and Kurota 2004; Herhahn and Hill 1998; Kurota 2006; Lightfoot 1990). In contrast, little is known about farming features in the regions to the south.

To date, much of what we know about prehistoric farming techniques in southern New Mexico derives from the pioneering work of Meade Kemrer. For example, at least six sites with agricultural check dams and grid gardens, sometimes also associated with fieldhouses, have been documented by Kemrer and colleagues (Kemrer et al. 2002a and 2002b) in the Cedar Mountains region of southwestern New Mexico (Figure 7, Table 1). This area also contained 11 sites where it was inferred that flat areas near drainages were likely used as farm fields. Finally, at least eight rock piles have been found at one site, LA 132656, and were interpreted as probable cobble mulch farming features (Kemrer et al. 2002a). The presence of Mimbres Black-on-white ceramics at these sites indicates that they were likely occupied by Mimbres people, probably during the growing season.

Kemrer and Kennedy (2008) also report both direct and indirect evidence for farming from the west side of the San Andres Mountains. There, at least 11 major residential village sites are associated with leveled flats near drainages. Of these, notable sites include Cottonwood A, D, E, and F, Fleck Draw, Fleck Ranch, Cedar Well, Bruton Bead, and Indian Tank. El Paso Bichrome and El Paso Polychrome in association with Mimbres Black-on-white Styles II and III at these sites indicate close ties between the Jornada Mogollon and Mimbres Mogollon. Supplied by seasonal rainwater, flat areas near masonry roomblocks are thought to have functioned as farming fields (Kemrer and Kennedy 2008). While rainwater may have been redirected from the drainages by simple man-made canals, such irrigation features have not yet been discovered, perhaps a result of the lack of archaeological excavation at these pueblo sites.

Nevertheless, two possible irrigation canals have been reported from the eastern side of the Tularosa Basin. One of these is reported at the Scorpion Site, LA 119530, in Alamogordo. At the Scorpion Site, a Doña Ana phase Jornada Mogollon residential locus, a possible irrigation canal, Feature 48, was found on an alluvial fan. The feature was at least 6 m long and 20 cm deep and was filled with ashy soil (Turnbow and Kurota 2008:120). A large volume of maize recovered from many associated features suggests that the residents of the Scorpion Site practiced agriculture.

A second possible prehistoric canal was recently discovered at Creekside Village, LA 146443, just east of the town of Tularosa. The feature is located in proximity to a great kiva, an extremely rare find in the Jornada Mogollon region (David Greenwald, personal communication, 2015). The discovery of the two canal features indicates that Jornada Mogollon people knew how to transport water, at least over short distances, to areas with soils amenable for seasonal farming. Significantly, both the Scorpion Site and the Creekside Village Site yielded substantial amounts of Mimbres Black-on-white ceramics.

An additional two Jornada Mogollon sites with agricultural features have recently been documented by the University of New Mexico's Office of Contract Archaeology (OCA) along the eastern edge of the Tularosa Basin in proximity to the Organ Mountains. The first site, LA 104864, is a massive complex of adobe roomblocks located near the edge of a broad playa basin. A cluster of fieldhouses near the playa area suggests that it was probably used to grow cultigens. The second site, LA 158961, is situated on an alluvial fan extending from the Organ Mountains. Here, a complex of over 50 prehistoric rock piles was documented in association with fieldhouse structures, along with suspected multiple buried pithouses.

Yet two additional sites with inferred farming activities were reported from New Mexico's bootheel region, during OCA's Border Fence Project survey (Kurota and Cohen 2010). Each revealed a fieldhouse associated with a possible farm field near a shallow drainage. Ceramics at one site, LA 162001, indicate an Animas phase occupation, while the second site, LA 161104, contains Casas Grandes Plainware ceramics and painted wares indicating a possible Casas Grandes cultural affiliation.

The sites with inferred farming activities that we have discussed above provide an initial picture of the different types of agriculture features and their distribution throughout the landscape of southern New Mexico. It is quite likely that more such sites exist and await discovery.

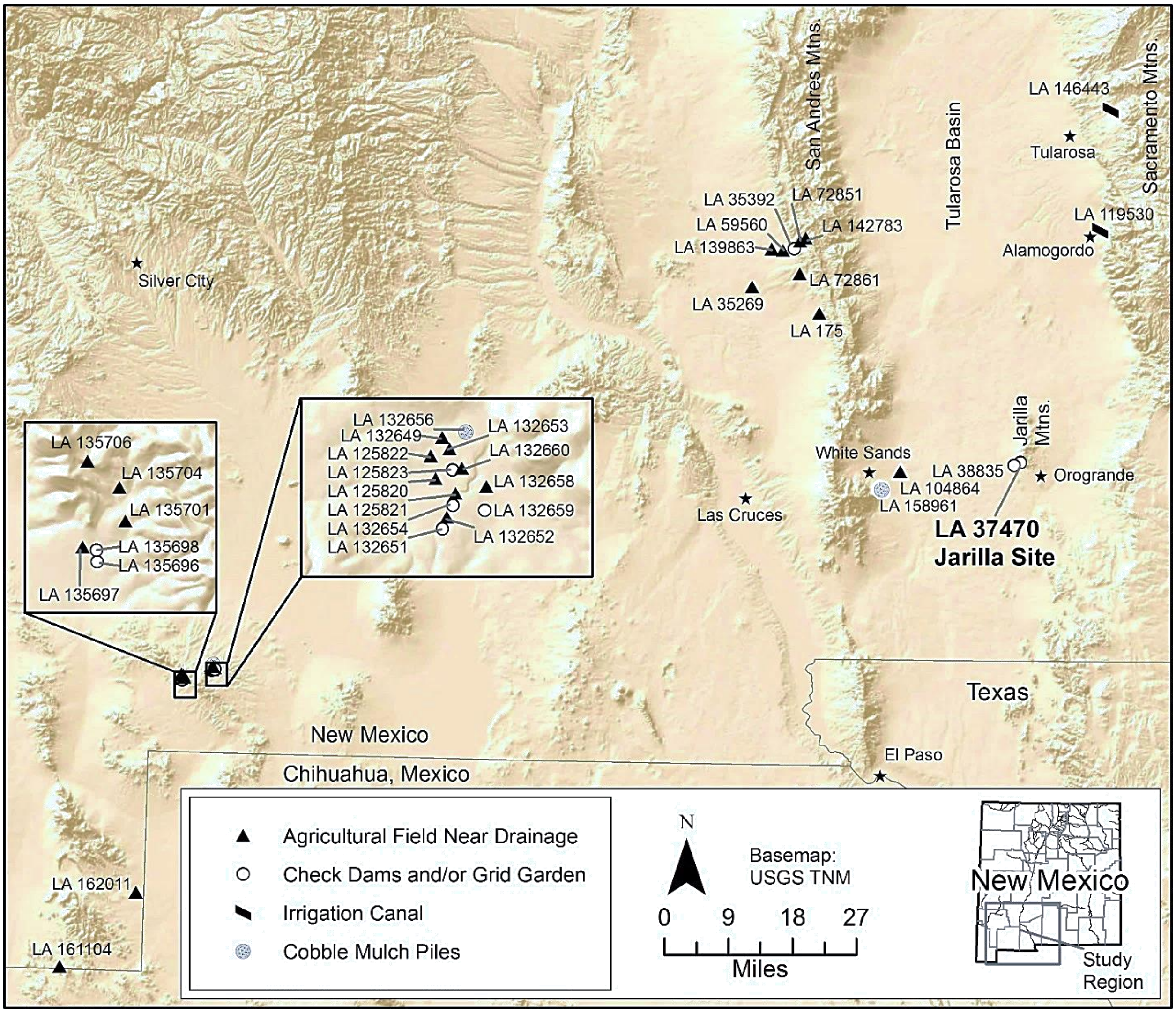

Figure 7. Map of southern New Mexico showing locations of previously recorded prehistoric agricultural sites.

Table 1. *Previously documented prehistoric agricultural sites in southern New Mexico.*

Region	Culture*	Occupation Period (AD)	LA No.	Structures	Agricultural Features	Reference
Cedar Mts.	M	650-750; 1000-1150	125820	2 rock structures	Nat. swale?	Kemrer et al. 2002a
Cedar Mts.	M	550-650	125821	Fieldhouse	Lg. drainage	Kemrer et al. 2002a
Cedar Mts.	M	650-750	125822	Pithouse?	Nat. swale?	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130; 1130-1200	125823	Fieldhouse	Drainage with check dams	Kemrer et al. 2002a
Cedar Mts.	M	750-1000; 1130-1200	132649	4 rock structures, 3 pithouses?	Nat. swale?	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132651	1 rock structure	15 m rock alignment	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132652	1 rock structure	Lg. drainage	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132653	-	Lg. drainage	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132654	2 fieldhouses	2 rock alignments	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132656	-	8 cobble mulch piles, 1 rock alignment	Kemrer et al. 2002a
Cedar Mts.	M	1130-1200	132658	2 rock structures	Nat. swale	Kemrer et al. 2002a
Cedar Mts.	M	1130-1200	132659	2 rock structures	1 rock alignment	Kemrer et al. 2002a
Cedar Mts.	M	1000-1130	132660	1 fieldhouse	Drainage	Kemrer et al. 2002a
Cedar Mts.	M	200-1000	135696	2 structures?	11 m rock align.	Kemrer et al. 2002b
Cedar Mts.	M	650-1000	135697	21 structures	2 nat. swales	Kemrer et al. 2002b
Cedar Mts.	M	200-1000	135698	Structures	7 rock alignments	Kemrer et al. 2002b
Cedar Mts.	M	750-1000; 1000-1150	135701	Structures	Nat. swale	Kemrer et al. 2002b
Cedar Mts.	M	1000-1130	135704	4 rock structures	Drainage	Kemrer et al. 2002b
Cedar Mts.	M	970-1020	135706	2 rock structures	Drainage	Kemrer et al. 2002b
San Andres Mtns.	M	900-1140	35269, Bruton Bead	Adobe structures	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	900-1140	139863, Jaggedy	Pit and surface structures	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	900-1140	35392, Cedar Well	Field house	Terraced farming	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1300-1400	175, Cottonwood A	Clustered roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1300-1400	175, Cottonwood D	Linear roomblocks	Agricultural fields	Kemrer and Kennedy 2008

Region	Culture*	Occupation Period (AD)	LA No.	Structures	Agricultural Features	Reference
San Andres Mtns.	JM	1300-1400	175, Cottonwood E	Roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	900-1100+	175, Cottonwood F	Linear roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1140-1275	72861, Burned Corn	Roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1300-1400	72851, Fleck Draw	Clustered roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1275-1300+	142783, Fleck Ranch	Clustered roomblocks	Agricultural fields	Kemrer and Kennedy 2008
San Andres Mtns.	JM	1300-1400	59560, Indian Tank	Enclosed plaza, multi-story rooms	Agricultural fields	Kemrer and Kennedy 2008
Tularosa	JM	670-705	146443, Creekside Village	Great kiva pithouses	Irrigation canal	NMAC-L list serve
Alamogordo	JM	500 BC-AD 1450	119530, Scorpion Site	Residential complex	Irrigation canal	Turnbow and Kurota 2008
Bootheel	M	1200-1450	162011	Fieldhouse	Nat. swale	Kurota et al. 2010
Bootheel	CG	700-1250	161104	Fieldhouse	Nat. swale	Kurota et al. 2010
Jarilla Mtns.	JM	1000-1250?	37470, Jarilla Site	Pithouses and fieldhouses	Check dams, grid gardens	Kurota and Sternberg 2015
Jarilla Mtns.	JM	1000-1250?	38835	Pithouses and fieldhouses	Check dams, grid gardens	Kurota and Sternberg 2015
Organ Mtns.	JM	1200-1450	104864	Adobe roomblocks, fieldhouses	Playa basin	Kurota and Sternberg 2015
Organ Mtns.	JM	1100-1250?	158961	Pithouses and fieldhouses	50+ cobble mulch piles	Kurota and Sternberg 2015

*- M=Mimbres, JM=Jornada Mogollon, CG=Casas Grandes

Comparison of Mimbres Mogollon Soils with Those at the Jarilla Site

When evaluating agricultural potential at a site, whether the soil is agriculturally viable is an important consideration, as is the type of agriculture being practiced. Sandor et al. (2008) argue that the choices for agricultural locales by indigenous populations in the Mimbres Mogollon region were made based on specific soil characteristics that maximized both water absorption and water retention. Sandor and colleagues' observations suggest that other farming sites could be found on similar soil profiles throughout the Southwest. Thus, the physical nature of the local landscape, such as soil types, slope gradient, and direction of exposure, can influence what setting best holds water and what agricultural techniques will cause the least damage to the hydration profile.

The soils found on Mimbres farming terraces consist of surface organic matter with subsurface clay, often in areas which appear to have been ill-suited for such an endeavor (Sandor et. al. 2008). The agricultural surfaces typically occur on or near soils with clay horizons (Sandor et. al. 2008:170), with gentle slopes of 3-10 percent (Sandor et. al. 1990:74). The clay horizon may have allowed for the retention of water in the sandy overburden and thus allowed for the sub-irrigation of shallow crop roots. Situated on a <10 percent slope, the McNew/Copia Complex soils at the Jarilla Site fit into this soil pattern.

In terms of planting techniques, hand-planting is less destructive than mechanical planting to the soil hydration profile and does not disrupt the soil's water absorption and retention capabilities (Dominguez and Kolm 2005). Agricultural sites throughout the Southwest could thus have been chosen for the soil characteristics of water absorption and retention, despite being located in areas that look unsuitable for agriculture, because such soils are well-suited for hand planting techniques. Until the arrival of the Spanish, hand planting approaches to agriculture were ubiquitous throughout the Southwest.

Kemrer's research (2002) in the Cedar Mountains has demonstrated that alluvial fan soils can be viable for agriculture. Rain water is rapidly absorbed by the sand layer, which slows surface runoff and evaporation, allowing moisture to be available to crops (Kemrer 2013). Kemrer and Kennedy (2008) documented this type of soil seepage system at the Q3 soil level (below the Q4 eolian sands) on the western slopes of the San Andres Mountains; a similar soil profile was also observed by Dominguez and Kolm (2005) on the Hopi reservation.

The Jarilla Site is located on an alluvial fan, and the soils found there all share a USDA soil classification of "Class 7". This class has sub-classifications for specific attributes: "c" for climate, "e" for erosion, and "s" for "soil limitations within the rooting zone" (USDA 1961:6-11). The McNew/Copia complex is considered Class 7-c for agriculture, while the Pintura/Doña-Ana complex is considered 7-e. The soils outside the site, immediately sur-rounding the Jarilla Mountains to the northeast, consist mostly of Nickel-Tencee association soils, classified as 7-s. All three soils are rated by the USDA as "well-suited" for hand-planting (USDA Web Soil Survey 2015).

An aerial overview of the Jarilla Site reveals that the site boundaries fall within the limits of the soils suitable for farming. It appears that the site's agricultural features were laid out strategically along existing drainages that would have supplied surface water to the crops (Figure 8). A similar observation of a site being coterminous with the limits of a certain soil type has also been made at LA 173422, an agricultural locus roughly contem- poraneous with the Jarilla Site in the Jumanos area about 135 mi to the north (Beers 2013).

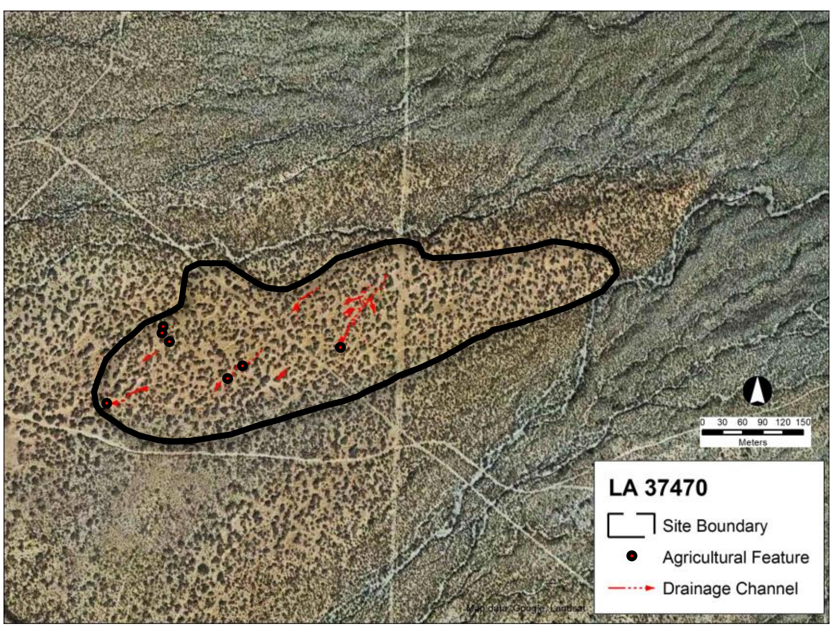

Figure 8. *Aerial photograph showing the boundaries of LA 37470 within the limits of a distinct sandy soil type. Arrows indicate locations of drainages near agricultural features that were probably used to direct surface water to planted crops.*

Macrobotanical Analyses

In all, 11 of the 16 tested features at the Jarilla Site yielded macrobotanical remains in flotation samples. Macrobotanical specialist Pamela McBride identified a variety of seeds, plant parts, and wood.

Macrobotanical analysis identified high frequencies of carbonized fragments of *Zea mays* in samples from both structures and from other tested features. Other macrobotanical remains identified from tested features include *Cucurbita* spp., amaranth, goosefoot, cheno-am, dropseed grass and other grass family, mesquite, possible pepperweed, possible pitaya, prickly pear cactus, purslane, sunflower, winged pigweed, yucca, and other unknown or unidentifiable plant parts.

These plant remains were recovered from pitstructure, midden, hearth, and pit contexts. All the identifiable species are potentially edible, and it is possible that they represent foraged wild resources and/or cultivars eaten alongside the maize and gourds. Non-food use is also possible.

Creosote, mesquite, possible ocotillo, saltbush, possible tarbush, and unknown conifer were identified from samples in nine tested features, including the historic structure, the two pitstructures, a midden, four hearths, and a pit. Some of these may represent fuelwood used by the inhabitants of the Jarilla Site, especially as creosote, mesquite, saltbush, possible tarbush, and unknown conifer all were recovered from hearths. None of the hearths, however, contained any ocotillo wood.

As all species of wood occurred in one or both pitstructures, some of the wood may represent building materials. In addition, some of the woody species are known to have edible parts and may have further supplemented dietary contributions that are documented by other macrobotanical remains.

Artifact Assemblage

Thousands of ceramics, flaked lithics, groundstone, and faunal remains cover the site surface (Figure 9).

The documented painted ceramic assemblage consists of 67 Mimbres Black-on-white, 12 El Paso Bichrome, and 11 El Paso Polychrome sherds indicating a late Doña Ana to early El Paso phase occupation. The El Paso Bichrome type was represented both by its red-on-brown and black-on-brown variants. Jornada Red-on-brown, Three Circle Red-on-white, and Playas Red were all represented by a single sherd each (Table 2).

Three of the Mimbres sherds were Style III of the Classic Mimbres Black-on-white (Figure 10r, s, and u). The remaining Mimbres ceramics are mostly bowl body sherds with alternating solid and hachured motifs and solid triangles with sawtooth edges (Figure 10). Most of the bowl specimens belonged to the Style II type. The Mimbres pottery was found scattered across the site, suggesting the use of the entire site area by its occupants.

A small number of corrugated brownware sherds was also noted on the site surface. These include Mimbres Corrugated (Figure 11 a), Mimbres Corrugated Punctate (Figure 11 b), and Mimbres Corrugated Incised (Figure 11 c and d).

This pottery was most likely not produced in the Tularosa Basin, as its paste and surface color are much lighter than the common El Paso brownwares. Instead, it is argued that the corrugated sherds were probably imported from sites west of the Basin, perhaps from the same areas where the Mimbres Black-on-white pottery originated.

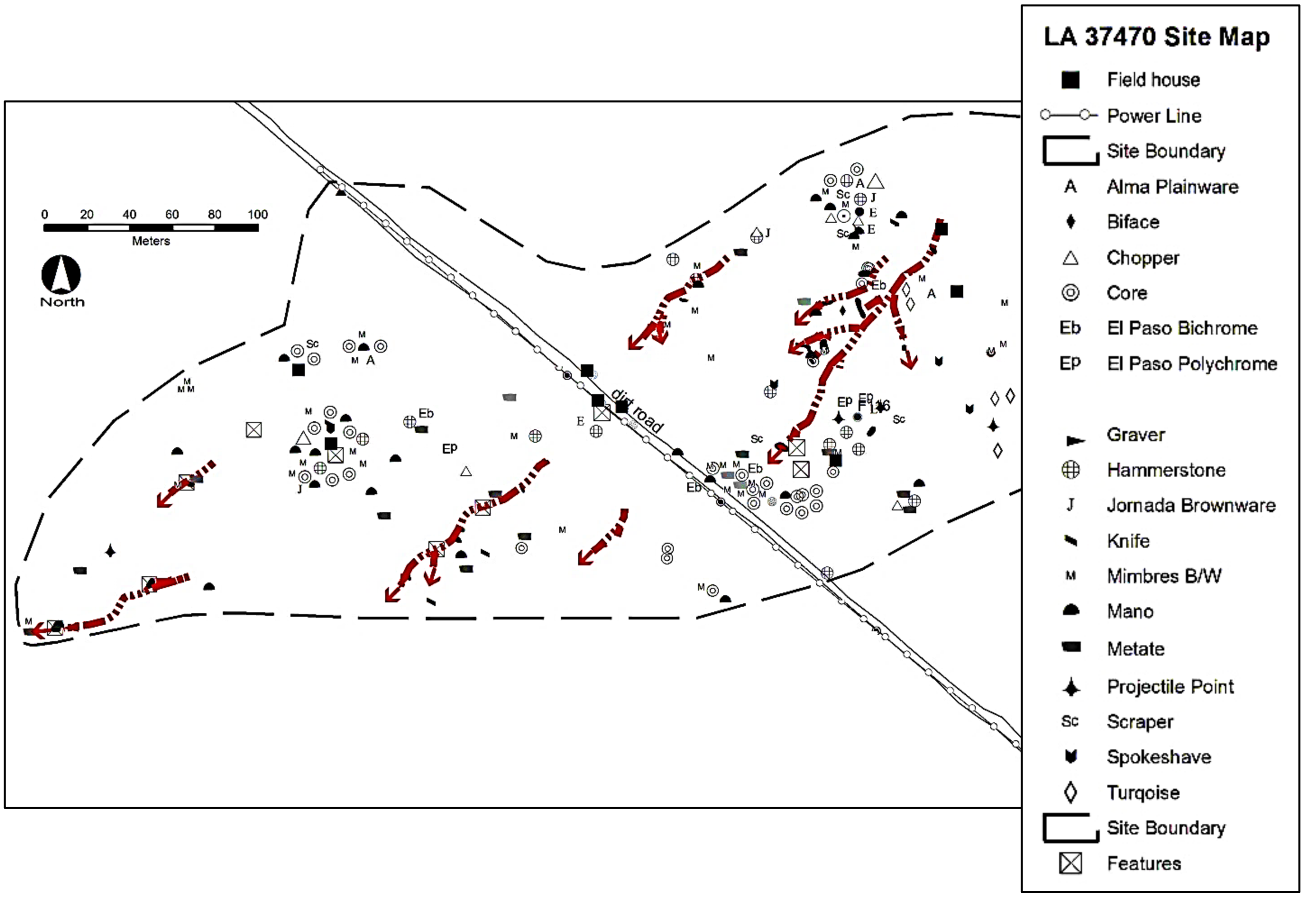

Figure 9. *Distribution of surface artifacts at the Jarilla Site. Arrows indicate the locations of drainages that were probably used to supply water for farming features.*

Table 2. *Decorated ceramics recorded at the Jarilla Site.*

Type	Collected	Surface Documented	Total	%
Mimbres B/W all styles	46	24	70	71.43%
El Paso Bichrome	10	4	14	14.29%
El Paso Polychrome	8	3	11	11.22%
Three Circle R/W	1	-	1	1.02%
Jornada R/Br	1	-	1	1.02%
Playas Red	1	-	1	1.02%
Total	67	31	98	100.00%

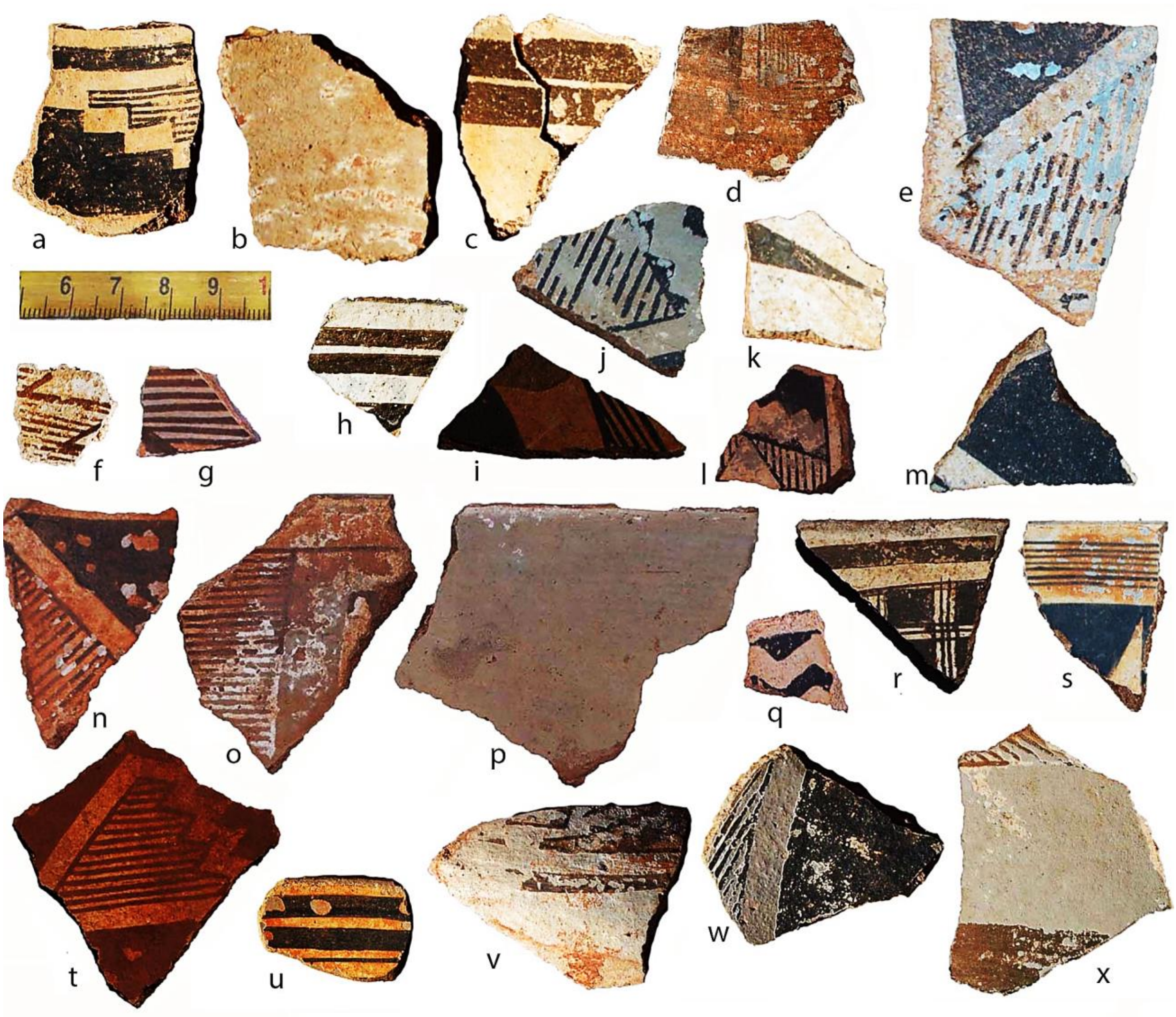

Figure 10. *Mimbres Black-on-white bowl (a-u, w, x) and jar (v) sherds from the Jarilla Site.*

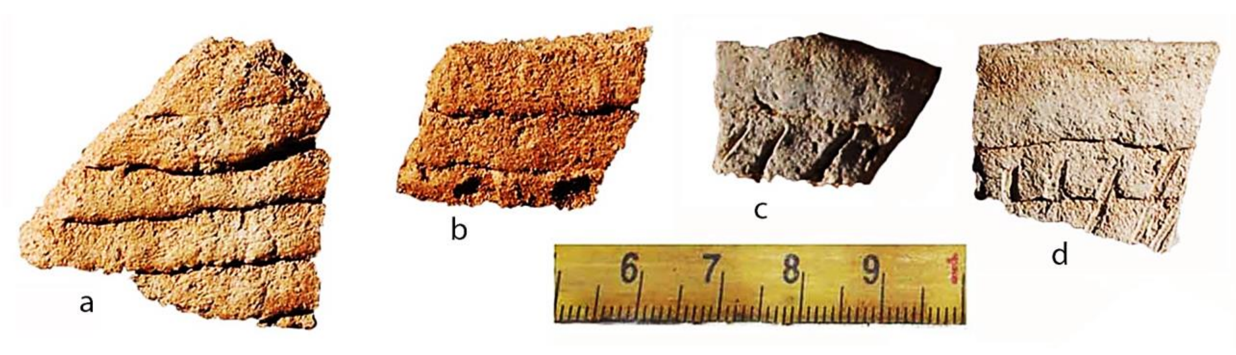

Figure 11. *Mogollon utility wares from the Jarilla Site: (a) Mimbres Corrugated, (b) Mimbres Corrugated Punctate, and (c, d) Mimbres Corrugated Incised.*

Laboratory analyses of collected lithic materials are not yet complete. However, surface lithics were selectively documented during the fieldwork. Most of the site's projectile point assemblage is of Archaic origin, although one Paleoindian Folsom point and one Jornada Mogollon point were also recorded (Figure 12).

Aside from the projectile points, the site's general tool assemblage contains hammerstones, cores, choppers, scrapers, and retouched flakes, most of which were found in middens and near fieldhouses.

Large cutting and smashing implements were also found and include large hammerstones, choppers, cobble unifaces, and a "tchamahia" or weeding tool (Figure 13). Kemrer and Kennedy (2008) argue that such tools were probably used for various purposes, including digging irrigation canals and working agricultural crops.

Groundstone tools consisted primarily of one-hand manos and slab metates. Both manos and metates tend to be ground on both of their flat sides and most show signs of edge shaping and surface refurbishment, activities that indicate an intensive use of grinding implements.

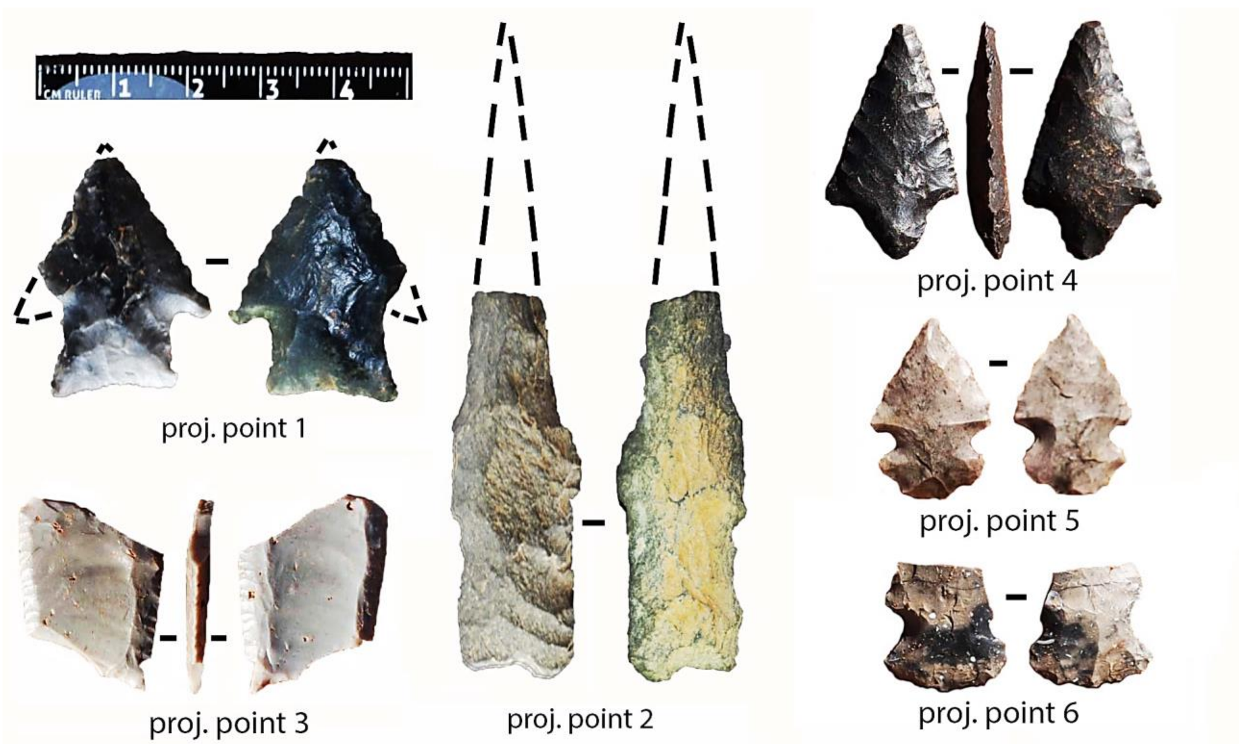

Figure 12. *Projectile points recovered at LA 37470: PP1 - San Jose style point; PP2 - Bajada style point; PP3 – fragmentary Folsom point; PP4 – Gypsum/Augustin point; PP5 – Pueblo side-notched point; and PP6 – Armijo style point.*

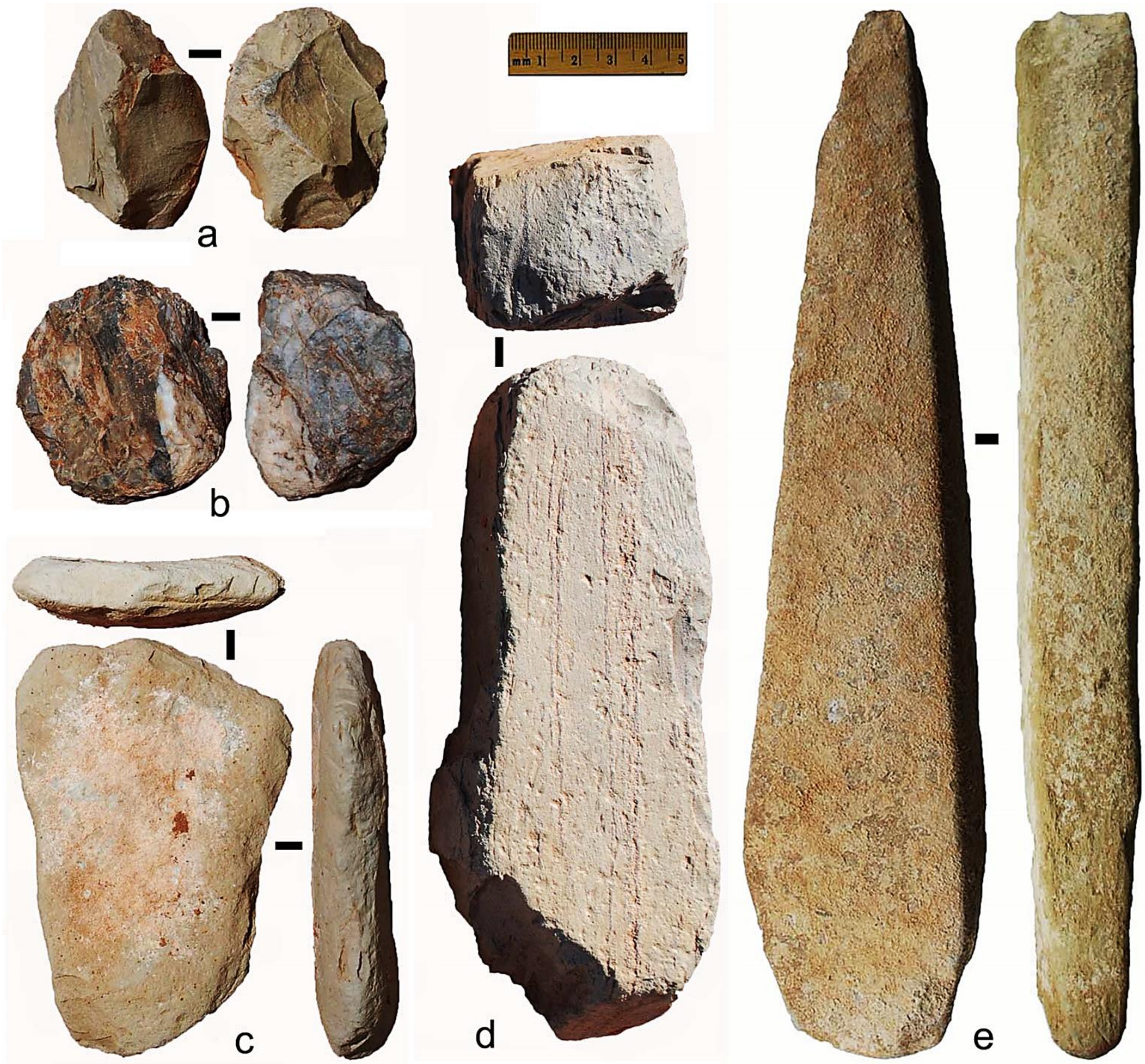

Figure 13. *Jarilla Site stone implements likely associated with farming activities: (a) core/chopper; (b) small hammerstone; (c) chopper/stone hoe; (d) large hammerstone; and (e) tchamahia/weeding tool.*

Possible Evidence for Trade

Turquoise

At least six pieces of turquoise and one malachite specimen were recovered at the Jicarilla Site (Figure 14, a and c). While most turquoise fragments were recovered from the fill of pithouse Feature 153, one turquoise fragment – together with the malachite – was recovered from the surface. The largest of the turquoise fragments reveals signs of initial grinding, which suggest that it was meant to be made into a pendant or to function as an inlay object. Turquoise is readily available in the Jarilla Mountains (Deyloff 2005; Warren 1988) and it was clearly procured by the site inhabitants.

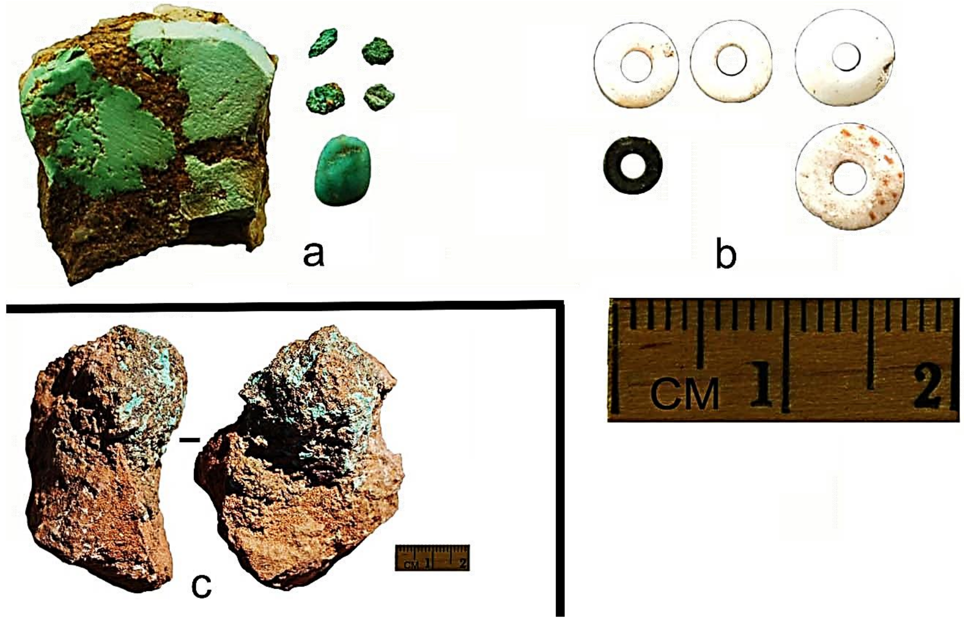

Figure 14. *Rare artifacts recovered at LA 37470: (a) turquoise fragments, with largest showing signs of edge modification; (b) shell disk beads; and (c) natural malachite nodule.*

Turquoise was mined in the American Southwest as early as 200 BC (Weber 1979). Spanish explorers have left documentary evidence behind of such activities in historic records (Ball 1941; Warren 1988), and archaeological explorations of known turquoise deposits have revealed prehistoric tools and other artifacts (Ball 1941; Deyloff 2005). Ethnographic accounts and dated ceramics at Cerrillos, a well-known source (Ball 1941; Deyloff 2005), show that mining for turquoise took place there before the arrival of the Spanish (Ball 1941; Weber 1979; Weigand 1982). Evidence of mining at the Orogrande source has been less specific (Weigand 1982), although it has been posited that evidence of prehistoric mining led to expeditions in the Jarillas for the same purpose in the historic era (Deyloff 2005). All of these efforts to obtain the gemstone are a testament to its value, both in modern times and prehistory.

There is little evidence in the prehistoric Southwest for the centralized control of resources such as turquoise. Ethnohistoric accounts seem to indicate that control of resources depended more on proximity to the source than any claim of ownership (Snow 1973:47). As a consequence, it is possible that commodity control was being exerted over the Orogrande turquoise by occupants of the Jarilla Site (Deyloff 2005).

To determine whether the turquoise present at archaeological sites was derived from local sources or not depends on being able to reliably source the turquoise in question. This has been problematic in the past. New research shows promising results, however. In 2015, Thibodeau et. al. published a paper demonstrating that turquoise can be reliably sourced by the analysis of strontium and lead isotopes occurring in the stone. Thibodeau et. al. were able to group the sources of turquoise into four distinct locations (Figure 15), demonstrating that the Orogrande source is part of the Rio Grande Rift, which includes the Cerrillos source, as well. Other sources of turquoise are found further to the west in the boot heel of southwestern New Mexico, and in Arizona, Nevada, Mexico, and California (Thibodeau et. al. 2015).

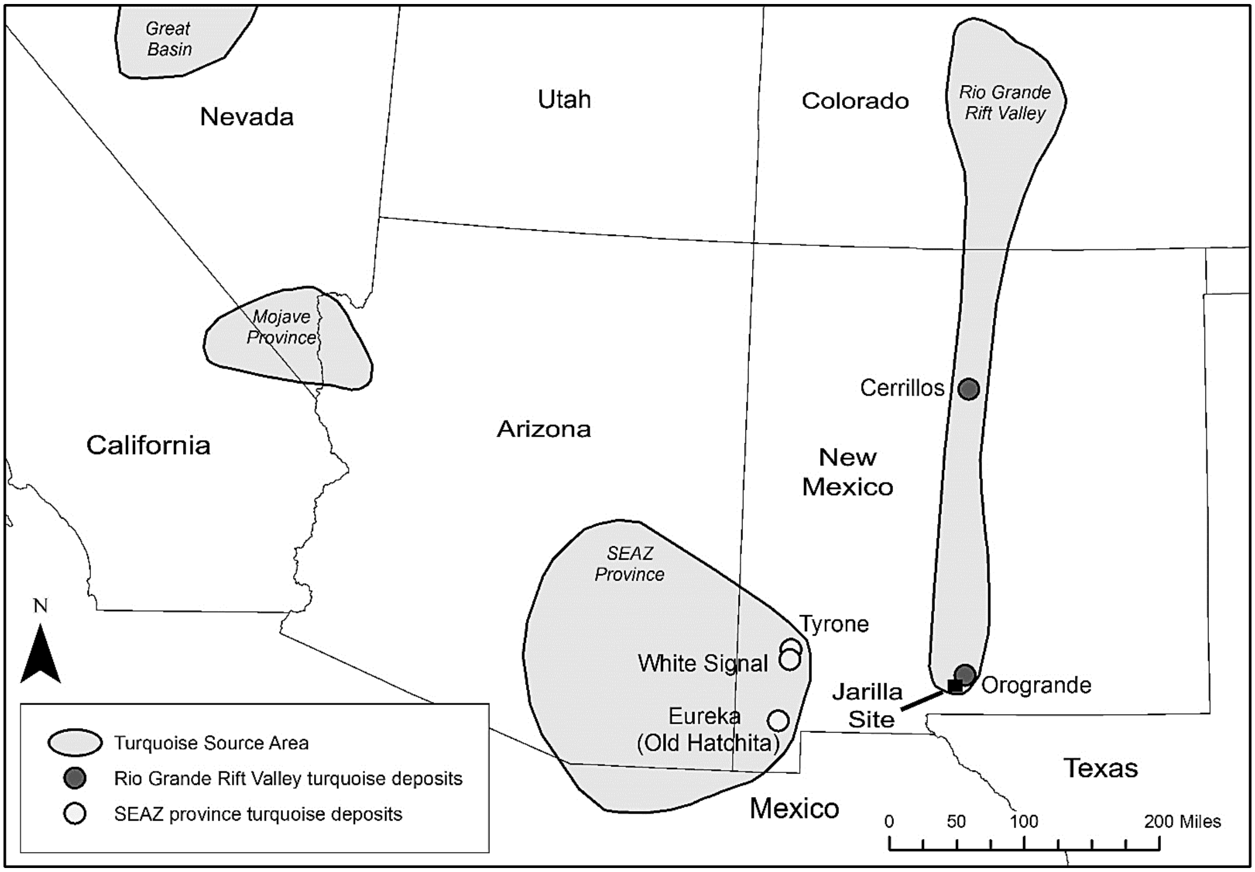

Figure 15. *Map of southwestern United States showing major sources of turquoise deposits (adapted from Thibodeau et al. 2015 with permission from Geological Society of America).*

Shell

Five white disk beads made of marine shell were also recovered at the Jarilla Site, most of which came from the fill of the large structure, Feature 153 (Figure 14b). Whether shell beads were traded as a raw, unworked material or as finished forms can be inferred from the presence of either tools (Yerkes 1983) or shell fragments, or both, at a site. In the American Southwest, shell-working activity areas, including shell debris and broken ornaments, have been identified on house floors at Los Hornos and Snaketown in Arizona (Trubitt 2003), which supports the idea that shell working was not a specialized industry but rather a household pursuit (Feinman and Nicholas 1995; Masucci 1995). So far, only finished beads and none of the microtools identified by Yerkes, nor fragmentary, unworked shells, have been found at the Jarilla Site.

It is likely, then, that the marine shell found at the Jarilla Site was traded for something of value, perhaps the turquoise present in the Jarilla Mountains. With the advent of the new isotope sourcing techniques, we can seek to identify Jarilla turquoise at other sites across the Southwest, and thus begin to develop a more complete picture of ancient trade networks and relationships.

The most obvious indicator for long distance trading at the Jarilla Site is the unusually robust frequency of Mimbres Mogollon ceramics, including both the painted Black-on-white and the unpainted utility wares. In fact, with 71.43 percent of all painted ceramics at the Jarilla Site classed as Mimbres Mogollon ceramics, this site has one of the highest volumes of Mimbres Black-on-white pottery among all residential sites in the Tularosa Basin. The occurrence of a variety of Mimbres corrugated utility ware further accentuates the massive number of Mogollon ceramics at the Jarilla Site. The data suggest that site occupants had very strong relationships with Mimbres populations and imported large quantities of black-on-white and utility ware pottery from areas west of the Rio Grande, perhaps as a consequence of family ties.

Conclusions

The OCA archaeological test excavations have revealed that the Jarilla Site was an agricultural locus with a variety of farming features, including fieldhouses, check dams, and grid gardens that were used to grow large volumes of maize and some squash. Our most-recent results of pollen analysis performed by Susan Smith revealed the presence of maize in the soil of one of the grid gardens, Feature 24, further supporting the argument of the rock features being used for farming purposes. The placement of the features across or in proximity to existing shallow drainages indicates the use of surface water runoff. In some cases, water may have been redirected from the drainages by short canals excavated with minimally shaped stone implements.

The six trash middens attest to intensive, likely year-round occupation at the site, a supposition that is also supported by the discovery of two large pithouses. One of these features may have been used as a communal structure, implying that the inhabitants organized as a community for ritual or other communal events.

The site occupants also appear to have selected certain types of landscape attributes that allowed surface runoff farming, similar to that postulated by Sandor et al. (2008) for the Mimbres region. Attributes include proper soil type and low slope gradient that would allow for easy control of surface water flow. These two setting attributes, together with the strong regional ties inferred from the ceramic assemblage, suggest that the site occupants drew much of their knowledge of farming from Mimbres farmers.

Alternately, the unusually robust volume of Mimbres pottery may suggest that a small group of Mimbres people relocated to the site area. Possible reasons for this geographic transfer are numerous, but perhaps the most logical one would have been to obtain access to the Orogrande turquoise for purposes of trade. Securing access to this commodity would have allowed the site occupants to reach out for more distant articles of trade, such as marine shell from coastal regions. The people who buried the child at the site covered the child's head with a ceramic vessel – a trait also common among Mimbres burials. Although the burial vessel was just a fragment of an El Paso Bichrome jar – and thus did not show evidence that it was "killed" – the child's burial is among the only ca. 15 percent of burials with offerings in the Jornada Mogollon region where the head was covered with a ceramic vessel fragment (Miller 2015).

Clearly, more research at the Jarilla Site promises to answer newly emerging questions about farming in this locale and also about the site's possible role in the regional trade network of the late 12th to early 13th century.

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