Phase II Evaluation of the Cultural Resources of the Vista Del Agua Project, a 277-Acre Parcel with 4300 Linear Feet of Offsite Improvements Just South of the I-10 between Tyler and Polk Streets in the City of Coachella, Riverside County, California APNs: 603-122-05; 603-130-03, -04 & -09; 603-150-04, -05, & -07 thru -12

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National Archaeological Data Base Information

Type of Study: Phase II Evaluation
Sites: CA-RIV-7834, -7835, and -7836; CA-RIV-11775, -11776 and -11817
USGS Quad: 1956 (1972 photorevision) 7.5' *Indio* quad
Township & Range & Section: NW¼, SW¼, and SE¼ of Section 28 of T5S, R8E (SBBM) + linear segment bordering the SE¼ of Section 29.
Area: 277 acres + about 4300' of linear road, water and sewer segments
Keywords: Coachella Valley, City of Coachella, Coachella Canal, Whitewater River, Interstate 10, Riverside County, Avenue 47, Avenue 48, Tyler Street, Polk Street, Phase II test excavations, prehistoric sites, historic sites, plant food resource procurement sites, possible ceramic firing pit or hearth, fire-altered rock, ceramics, Salton Brown, Topoc Buff, Tumco Buff, bowls, jars, thin sections, petrographic analysis, radiocarbon dates, direct rims, recurved rims, hearths, charcoal, one small burnt bone, washer for vehicle, prehistoric Lake Cahuilla, sand dune, hammerstone, possible groundstone, fish vertebrae, adobe chunk, FAR, flakes, hearth cleanout feature, residential foundation, water control features, standpipes, water pressure regulators, reservoirs, well, water flow meters, historic trash scatters, Eastern Information Center.

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MANAGEMENT SUMMARY

PROJECT DESCRIPTION AND LOCATION

The proposed project by Lansing and Associates involves a 277-acre parcel in the City of Coachella in Riverside County, California, whose APNs include 603-122-05; 603-130-03, -04 & -09; and 603-150-04, -05 & -07 thru -12. The project area is bounded by a frontage road just south of Interstate 10 to the north, Polk Street to the east, Avenue 48 to the south, and farmland and some residential land to the west. The project is in the NW¼, the E½ of the SW¼, and the SE¼ of Section 28 in Township 5 South, Range 8 East, San Bernardino Base Meridian, as shown on the 1956 (photorevised 1972) USGS 7.5' *Indio* quad (Figures 1-3). In addition, 4300 ft. of proposed offsite linear road, water and sewer improvements are also part of the project.

SCOPE OF WORK AND PROJECT PERSONNEL

The project area was first surveyed and was the subject of Phase II test excavations at RIV-7834, -7835 and -7836 in 2005 (see Dice and Messick 2005). Since it had been nearly 10 years since the previous survey, an updated records search was conducted and the project area was re-surveyed by Professional Archaeological Services (PAS) under the supervision of the project Principal Investigator, Dr. Philip de Barros. The survey took place in March and November 2014, in compliance with environmental review requirements under the California Environmental Quality Act (CEQA). A Phase I report was submitted about its findings with recommendations regarding site significance and recommendations for further work on October 20, 1014, with revisions that included the results of surveying offsite water, sewer and road components on December 8, 2014.

The Phase I survey discovered that prehistoric archaeological site CA-RIV-7834 was much larger than originally reported and that three of four loci had not been tested. In addition, it was recommended that additional archival research and test excavations be conducted at the house foundation site CA-RIV-11776. The present report discusses the findings of these Phase II investigations and makes final recommendations as to site significance and proposed mitigation measures.

NATIVE AMERICAN CONSULTATION

On March 25, 2014, a letter was faxed to the Native American Heritage Commission (NAHC) asking for a Sacred Lands Check. In a letter dated May 26, 2006, Dave Singleton of the NAHC responded that no Native American sacred sites are present within or adjacent to the project area. Prior to the resurvey, Dr. de Barros contacted Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians and a representative from the tribal office of the Torres-Martinez Desert Cahuilla Indians to see if they would like to participate in the

survey of the property. Both declined at this stage but both wished to be informed when potential impacts to cultural resources were determined. On April 29, a letter was sent or faxed to all of the tribal representatives on the list provided by the NAHC. This letter provided preliminary information about RIV-7834, -7835, and -7836 that underwent test excavations and significance evaluation in 2005, and concluded that RIV-7835 was a significant resource under CEQA. They were also informed about the preliminary results of the March 2014 resurvey, including that RIV-7834 and RIV-7835 were remapped and that the small site, RIV-7836, could not be relocated. They were also informed of the recording of water control features along Avenue 47 (RIV-11775) and a historic house foundation dating to after World War II (RIV-11776).

Two responses were received. The first was a letter dated April 30, 2014, from Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians in Indio. She indicated that the project area was outside of current reservation boundaries, that they had no knowledge of any sacred/religious sites within or near the project area, and that they would defer to the Torres-Martinez Band of Desert Cahuilla for further consultation. The second was from Mary Ann Green, Tribal Chairperson of the Augustine Band of Cahuilla Indians dated May 23. She said they are unaware of specific cultural resources within or near the project area, but encouraged us to talk to other tribal representatives and to be sure an Indian monitor is present during construction. She also asked to be informed about the discovery of any cultural resources during project development.

Additional email comments were received after the submission of the Phase I report. These include an email dated December 30, 2014, from Chris Devers, Cultural Clerk for the Pauma Band of Luiseno Indians and an email dated March 4, 2015, from Katie Eskew, archaeologist, from the THPO's office of the Agua Caliente Band of Cahuilla Indians. Mr. Devers deferred "any knowledge of cultural related sites or resources to our sister Bands of Cahuilla." Ms. Eskew stated the project is not within the Agua Caliente Reservation but is within the "Tribe's Traditional Use Area" (TUA) and requested of a copy of the relevant cultural resources reports. Finally, Shawn Muir of the Twenty-Nine Palms Band of Mission Indians Tribal EPA office in Coachella sent an email dated February 17, 2015, requesting a copy of the EA or EIR associated with this project.

Phase II testing took place in stages in November and December, 2014, and on March 7, 2015. For the work in November, requests for Tribal Monitors were made by phone to Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians, and to Mary Ann Green, Tribal Chairperson of the Augustine Band of Cahuilla Indians, but they both stated they did not have any trained monitors and they indicated we should contact the Torres-Martinez Indian Reservation (Torres-Martinez Desert Cahuilla Indians).

A call was placed to the Torres-Martinez' Planning Director, Roland Ferrer on November 21, 2014 (Appendix B). Mr. Ferrer returned the call that same day and

requested a copy of the initial Phase I report. This report was submitted to the City of Coachella before an additional 4300' of water, sewer, and road improvements were added, largely offsite. The subsequent survey of these improvements did not reveal any additional prehistoric cultural resources. After discussing the project with Mr. Ferrer, Dr. de Barros sent the initial Phase I report and summarized its results via email; he also summarized the results of initial test excavations that took place on November 21 and 23 and requested an Indian Tribal Monitor to monitor test excavations that were to take place on December 6-7. Unfortunately, Mr. Ferrer did not receive the report or email and as a result no monitor could be provided on those days.

Robin Lawson was eventually sent as a tribal monitor for the test excavations that took place on December 29-31 to investigate an intact hearth discovered on December 7th. Mr. Lawson monitored on December 29-30 and was extremely helpful, including his discovery of additional surface pottery that had been exposed due to a brief rain the week before. This led to additional surface collections and additional test units to cover the expanded Locus C. Later, it was determined that another day of additional testing would be necessary to better understand the nature of the hearth complex. Dr. de Barros requested that Mr. Lawson come on March 7th for a half-day of fieldwork, but he was unable to come on that date. This concluded the fieldwork at RIV-7834. After the ceramics and charcoal were analyzed and the site was dated, a preliminary summary of the results was sent to Roland Ferrer on May 4, 2015, prior to the completion of this Phase II report (Appendix B). To date, no response has been received.

CURATION

The field notes, photographs, artifacts and ecofacts from the Phase II archaeological excavations at CA-RIV-7834 will be curated in the Archaeology Laboratory of Palomar Community College in San Marcos, San Diego County, California.

FINDINGS

Previously Recorded Prehistoric Sites

RIV-7834 (P-33-14403)

RIV-7834 consists of four ceramic scatters, Loci A-D. Locus D was recorded and tested in 2005. Loci A-C were recorded during the 2014 resurvey and later underwent Phase II test excavations. A total of 30 test units excavated nearly 25 cubic meters of soil in Loci A-C. Locus D was not investigated as Dice and Messick (2005) had already done so. With the completion of the test excavations, RIV-7834 now measures 240 m (N-S) by 76 m (E-W) and is between -44 and -29 feet below sea level in elevation, placing it within the lakebed of prehistoric Lake Cahuilla. Plant resource procurement during the winter season within the creosote

and saltbush scrub environment, including the former presence of mesquite, was the primary objective of most of the prehistoric activity at Loci A-D. Such activity occasionally led to broken ceramic bowls or jars creating the ceramic scatters associated with these loci. Most of the pottery in Loci A, B and D is either on the surface or just beneath the surface. Locus A measures 68 x 21 m in size. It produced about 25 sherds (excluding tiny fragments), a fish vertebra that is probably not cultural, and a large metal washer, probably from a vehicle. No other artifacts or features were encountered. Locus B measures 103 x 20 m in size and produced nine sherds, virtually all surface material. Locus D measures 55 x 40 m in size and produced 20 pottery sherds.

While Locus C was also used for plant resource procurement, it differs in two ways: it has a good deal of pottery found below the surface, often to depths of 15-30 cm with two attaining 50-55 cm; and it contains at least three hearths relatively rich in charcoal, two in a hearth complex centered on Unit 24 and third about 5 m to the west in Unit 25. The charcoal from the two Unit 24 complex hearths produced mesquite, creosote, saltbush, sage, some oak, and a bit of ironwood and smoke tree, but no food remains. The Unit 25 hearth and Hearth #1 in the Unit 24 complex produced charcoal-based, calibrated radiocarbon dates of Cal 1290 to 1405/1410 AD and an enigmatic oxidized layer with charcoal spots that overlaps with Hearth #1 was dated to Cal 1400 to 1450 AD. Aside from a very small piece of burnt animal bone, no other artifacts were recovered from Locus C, including no human remains. The principal ceramic types identified to date include Salton Brown, Topoc Buff and the sherd-tempered Tumco Buff; the latter suggests cultural contacts with the Lower Colorado River. Since the hearths and the site as a whole have produced virtually no food remains or artifacts that suggest camping or habitation, they may be daytime camp fires hearths for warmth during cool winter days and/or they may have been used to fire pottery.

The stratigraphy or geomorphology of the site along with the radiocarbon dates indicate that the Locus C hearths were used during the 14th and/or early 15th centuries. The surface and near-surface pottery in Loci A, B and D, as well as in Locus C probably represent plant food resource procurement activities that date to after the last infilling of ancient Lake Cahuilla in the 17th century. RIV-7834 is located at an elevation between -29 and -44 ft. below sea level and thus represents a recessional shoreline site.

RIV-7835 (P-33-14404)

This site, which is 50 x 34 m in size, is different from RIV-7834 in that surface pottery, which was catalogued by Dice and Messick (2005) as mostly Salton Buff with one Salton Brown and a Colorado Beige, was accompanied by stone tools, including a hammer/chopper and a possible mano. The 2005 test excavations included 18 test units excavated to depths between 40 and 120 cm. Sherds were found primarily in the upper 40-60 cm with some between 60-80 cm and 100-120 cm. All other artifacts were found in the upper 40-60 cm. Deep charcoal staining

suggestive of a hearth clean-out was encountered in the 60-80 cm level of Test Unit 4; charcoal bits were encountered in the 40-60 cm level in both Units 4 and 5; and a possible adobe chunk at 30 cm in Unit 17 was found in association with three fish vertebrae and a piece of fire-altered rock. Subsurface artifacts included at least seven flakes (two utilized) made of quartz, chert or jasper, quartzite and basalt. In addition, a few pieces of fire-altered rock, a possible quartz crystal, one or two possible ground stone tools, several fish vertebrae, and four tufa fragments were recovered.

The presence of surface and subsurface sherds and other artifact types in the deposit, along with possible features in the upper 30-80 cm, suggest the presence of a buried site that was once situated along a recessional shoreline dating to a pre-16th or -17th century infilling of prehistoric Lake Cahuilla. The site was initially thought to date to the Patayan I Period (ca. 750-1050 AD) due to the presence of direct vessel rims, but more recent work on the Patayan Period brings that assumption into question. RIV-7835 may have a subsurface component as old as or even older than the 14-15th century hearths found at RIV-7834. Finally, there is the non-cultural oxidized zone in Locus C that appears to represent the reworking of a prehistoric burn area by unknown natural processes during the first half of the 15th century.

RIV-7836 (P-33-14405)

This site is relatively small, measuring 26 by 15 m; it was found within a relatively dense cluster of saltbush. Only 14 sherds were recovered from the surface and subsurface during the 2005 test excavations. Virtually all ceramics were recovered from the upper 20 cm, save one. Eleven sherds were identified as Salton Buff and two as Salton Brown. In addition four glass shards were recovered between 0-50 cm, and one freshwater shell sample was taken from the surface of Test Unit 2. No features were encountered. RIV-7835 most likely served as a seasonal plant food resource procurement site after the last major infilling of prehistoric Lake Cahuilla in the 17th century.

Newly Recorded Historic Archaeological Sites

RIV-11775 (P-33-23969): Water Control Features along Avenue 47

This site consists of seven loci (A-G) containing between one and six currently used and/or abandoned water control features, including standpipes, water flow gauges, water pressure regulators, water flow valves, a reservoir, and other features linked by an underground water supply system constructed in the early 1950s by the Coachella Water District after the completion of Coachella Canal in 1949. Water is delivered to the highest point of every 40-acre parcel along section lines in areas of the water district eligible and registered to receive it. These are gravity flow pipelines. Other networks provide underground tile drainage systems to carry high-salinity, used drainage water to the Salton Sea.

The loci and reservoir are along the south side of 47th Avenue between Polk and Tyler Streets in the City of Coachella. The site including an associated reservoir is 1,280 m (EW) in length and 15 m in width (NS) except for the reservoir where it is 92 m wide. It is situated between -40 ft below and 5 ft above sea level. Loci A, B, and D-G may contain features that are as old as 65 years with additional features added at later dates. Locus C, including the associated reservoir probably dates to after 1972 and is thus no more than 42 years old.

RIV-11817 (P-33-24051): Water Control Features along Avenue 48

The survey of Avenue 48 resulted in the recordation of a series of five water control features (Loci A-E) between Polk and Tyler Streets located mostly on the southern side of the road with Locus B situated on the north side. The loci vary from a single element (Locus B) to five elements (Locus A). All loci have elements that are still in use and all were built after World War II. The no-longer-used elements of Loci A, D and E, as well as the old well in Locus C, may date as early as the early 1950s and thus could be as old as 65 years.

RIV-11776 (P-33-23970): House Foundation and Associated Reservoir

This site consists of the foundations of a probable farm residence that was initially thought to have been built in the early 1950s after water was brought to the area via the Coachella Canal completed in 1949. The house burned down in 2011. Current remains consist of the house foundation and its adjacent cement porch and a foundation for a propane tank. Just east of the foundation is a shallow dry reservoir built after 1972. Two trash scatters are also present. Trash Scatter A is the result of the burial of burned house debris and trash after the fire. It contains burnt wood and burned and unburned plastic, paper, rubber, ceramic, glass, and metal artifacts of recent origin swept into small piles. Trash Scatter B consists of a light scatter of glass, ceramic and metal artifact fragments with not much depth. None of the material appears to be more than 15-20 years old. The entire site measures 128 by 85.5 m in size. Historic archival research indicates the site land was part of a quarter-section first patented in 1911 by George W. Ingram. A structure is shown near its present location on the 1956 USGS 7.5' *Indio* quad.

Test excavations in the trash scatters and additional archival research were recommended to help determine when this structure was built and whether it was associated with someone important in local history. However, archival research of the assessor's records in the Riverside County Archives in Moreno Valley found no evidence of any improvements on the property between 1943 and 1978. Historical aerial photos dating from 1977 suggest that a residence does not appear until 2002 or perhaps as late as 2005. The associated reservoir was built after 1972 in the same place as the residence as shown on the 1956 *Indio* quad, which would have resulted in the destruction of the residence. Neither the house remains nor the reservoir are more than 43 years old and thus RIV-11776 did not in fact have be evaluated as a cultural resource because it is less than 45 years old. As a result, no test excavations were conducted.

SITE SIGNIFICANCE EVALUATIONS AND RECOMMENDATIONS

CA-RIV-7834 (P-33-14403)

Given that RIV-7834 is a prehistoric site, its significance lies in its potential to satisfy Criterion D under CEQA, i.e., does it have the potential to provide information important in prehistory. Given the earlier Phase II excavations by Dice and Messick (2005) at Locus D, and given the extensive Phase II investigations undertaken for the present report that involved 30 test units that excavated 25 cubic meters of soil, and finally, given the diversity of artifacts and features at RIV-7834 is very limited (ceramics, charcoal, and fire-altered rock), it is the opinion of the author that the information potential of RIV-7834 has been largely exhausted with site recordation and the test excavations. In short, RIV-7834 is not viewed as a significant historical resource under CEQA. However, given the potential for additional hearths whose wood fuels could be sampled at dated, it is recommended that controlled grading be used in the vicinity of the Unit 24 complex and that the site's destruction be carefully monitored.

CA-RIV-7835 (P-33-14404)

After Phase II testing, Dice and Messick (2005) determined this site was not a significant historical resource under Criteria A-D but was significant under CEQA's uniqueness criterion. However, this assessment was based on the assumption that the presence of mostly direct ceramic vessel rims equated with a Patayan I (A.D. 750-1050) occupation; however, Hildebrand (2003) has shown direct rims may also date to later periods. Nonetheless, given the presence of a subsurface deposit that also contained lithic tools and debitage as well as ceramics and a possible hearth feature, it can be argued that this site is significant under Criterion D because of its potential to provide information important in prehistory, especially because its deeper occupation levels are likely to date from an earlier infilling and subsequent recession of prehistoric Lake Cahuilla prior to the last one in the 17th century.

In conclusion, RIV-7835 is a significant historical resource under CEQA based on Criterion D and should either be avoided or subject to data recovery excavations to mitigate potential impacts from project development.

CA-RIV-7836 (P-33-14405)

After Phase II testing, Dice and Messick (2005) determined that this site is not a significant historical resource under Criteria A-D nor under the uniqueness criterion under CEQ A. This determination was made on the basis of the lack of a substantial surface or subsurface deposit and the lack of artifact diversity, as only 14 sherds were encountered. Their assessment is viewed as correct; RIV-7836 is not a significant historical resource under CEQA. No further work is recommended.

CA-RIV-11775 (P-33-23969)

This site consists of seven loci of agricultural irrigation water control features just south of Avenue 47 that are linked to water provided by the Coachella Canal after its completion in 1948-49. The site is not linked to any significant historical event, such as one might argue for the construction of the Coachella Canal, and it is not associated with any significant individual at the local or regional level. The water control features are similar to other sets of such water control features in the general area. They also do not contain any unusual or unique architectural features. Thus, this site is not viewed as a significant historical resource under Criteria A-C or under the CEQA's uniqueness criterion. As for Criterion D, it is felt that this site's research potential has been exhausted with its detailed recordation, and therefore, it is not a significant historical resource under this criterion either. In short, RIV-11775 is not viewed as a significant historical resource under CEQA. No further work is recommended.

CA-RIV-11817 (P-33-24051)

This site consists of five loci of agricultural irrigation water control features along Avenue 48 that are linked to water provided by the Coachella Canal after its completion in 1948-49. RIV-11817 is not viewed as a significant historical resource under CEQA for the same reasons as outlined above for RIV-11775. No further work is recommended.

CA-RIV-11776 (P-33-23970)

This damaged cement foundation of a former farm residence was built in the early 1950s with associated trash scatters and an abandoned reservoir built after 1972. The results of the archival research discovered that the house was not built until after 1978 and historic aerial photos do not suggest a house was present until 2002 and possibly as late as 2005. In short, the house is at most 37 years old and probably no more than 13 years old. In fact, it turns out that the structure shown on the 1956 USGS 7.5 *Indio* quad was in the same place as the current abandoned reservoir, such that whatever structure was first there was destroyed prior to building the reservoir built in its place. The reservoir does not show up on the 1972 photorevision of the 1956 *Indio* quad indicating it was built after 1972. It is thus a maximum of 43 years old. There is also nothing unusual about the structure or architecture of the reservoir.

Because the historic house foundation is no older than 37 years old and the reservoir is at most 43 years old, neither need to be evaluated. Even if one considered evaluating the reservoir, there is nothing distinctive about its structure or architecture. In short, RIV-11776 is not viewed as a significant historical resource under CEQA. No further work is required.

SUMMARY OF MANAGEMENT RECOMMENDATIONS

Prehistoric Sites

- **RIV-7834** is not a significant historical resource under CEQA as its information potential has been largely exhausted with the test excavations. However, because there is the potential for the discovery of additional hearths whose charcoal could be sampled and analyzed and dated, controlled grading of the Unit 24 and 25 hearth area should be implemented and its destruction should be carefully monitored.

- **RIV-7835** is a significant historical resource under CEQA; the site should be avoided or undergo data recovery excavations prior to construction.

- **RIV-7836** is not a significant historical resource under CEQA as its information potential was exhausted with the test excavations; no further work is required.

Historic Sites

- **RIV-11775 & RIV-11817** are not significant historical resources under CEQA as their information potential was exhausted through site recordation; no further work is required.

- **RIV-11776** is not a significant historical resource under CEQA as its components are all less than 45 years old; no further work is required.

GRADING MONITORING

Given that portions of the property have relatively dense brush or existing vineyards, and given the potential for buried prehistoric sites resulting from past infillings and recessions of prehistoric Lake Cahuilla, there is the potential for the discovery of buried cultural deposits and potentially human remains. Therefore, construction monitoring shall be required that would include a county-certified professional archaeologist and a Native American Observer.

In addition, controlled grading (excavating at a slow pace a few inches of depth at a time) should be employed and monitored in Locus C of RIV-7834 in the vicinity of the Unit 24 complex and Unit 25 in case additional hearths are encountered that could be sampled for charcoal and radiocarbon dated.

SECTION 1 – INTRODUCTION

1.1 PROJECT DESCRIPTION AND LOCATION

The proposed project by Lansing and Associates involves a 277-acre parcel in the City of Coachella in Riverside County, California, whose APNs include 603-122-05; 603-130-03, -04 & -09; and 603-150-04, -05 & -07 thru -12. The project area is bounded by a frontage road just south of Interstate 10 to the north, Polk Street to the east, Avenue 48 to the south, and farmland and some residential land to the west. The property is just south of Interstate 10, about 1.5 miles northeast of downtown Coachella and the Southern Pacific Railroad, and 0.25 mile east of the Cabazon Indian Reservation. The project is in the NW¼, the E½ of the SW¼, and the SE¼ of Section 28 in Township 5 South, Range 8 East, San Bernardino Base Meridian, as shown on the 1956 (photorevised 1972) USGS 7.5' *Indio* quad (Figures 1-3). In addition, 4300 ft. of proposed offsite linear road, water and sewer improvements are also part of the project.

1.2 SCOPE OF WORK AND PROJECT PERSONNEL

The project area was first surveyed and was the subject of Phase II test excavations at RIV-7834, -7835 and -7836 in 2005 (see Dice and Messick 2005). Since it had been nearly 10 years since the previous survey, an updated records search was conducted and the project area was re-surveyed by Professional Archaeological Services (PAS) under the supervision of the project Principal Investigator, Dr. Philip de Barros. The survey took place in March and November 2014, in compliance with environmental review requirements under the California Environmental Quality Act (CEQA). A Phase I report was submitted about its findings with recommendations regarding site significance and recommendations for further work on October 20, 1014, with revisions that included the results of surveying offsite water, sewer and road components on December 8, 2014.

The Phase I survey discovered that prehistoric archaeological site CA-RIV-7834 was much larger than originally reported and that three of four loci had not been tested. In addition, it was recommended that additional archival research and test excavations be conducted at house foundation site CA-RIV-11776. The present report discusses the findings of this Phase II investigation and makes final recommendations as to site significance and proposed mitigation measures.

1.3 NATIVE AMERICAN CONSULTATION

On March 25, 2014, a letter was faxed to the Native American Heritage Commission (NAHC) asking for a Sacred Lands Check for the 277-acre parcel.

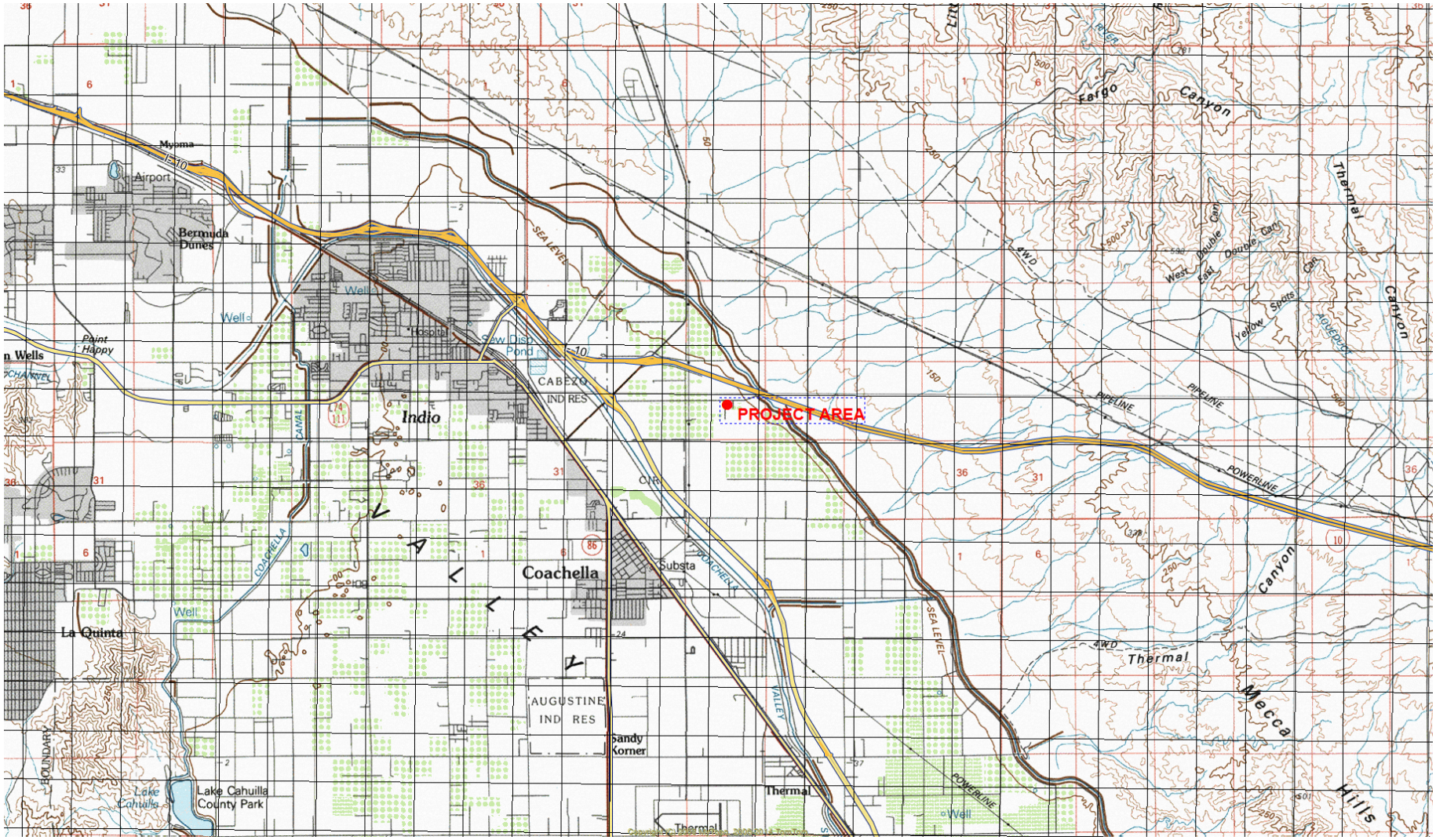


Figure 1: Project Vicinity Map

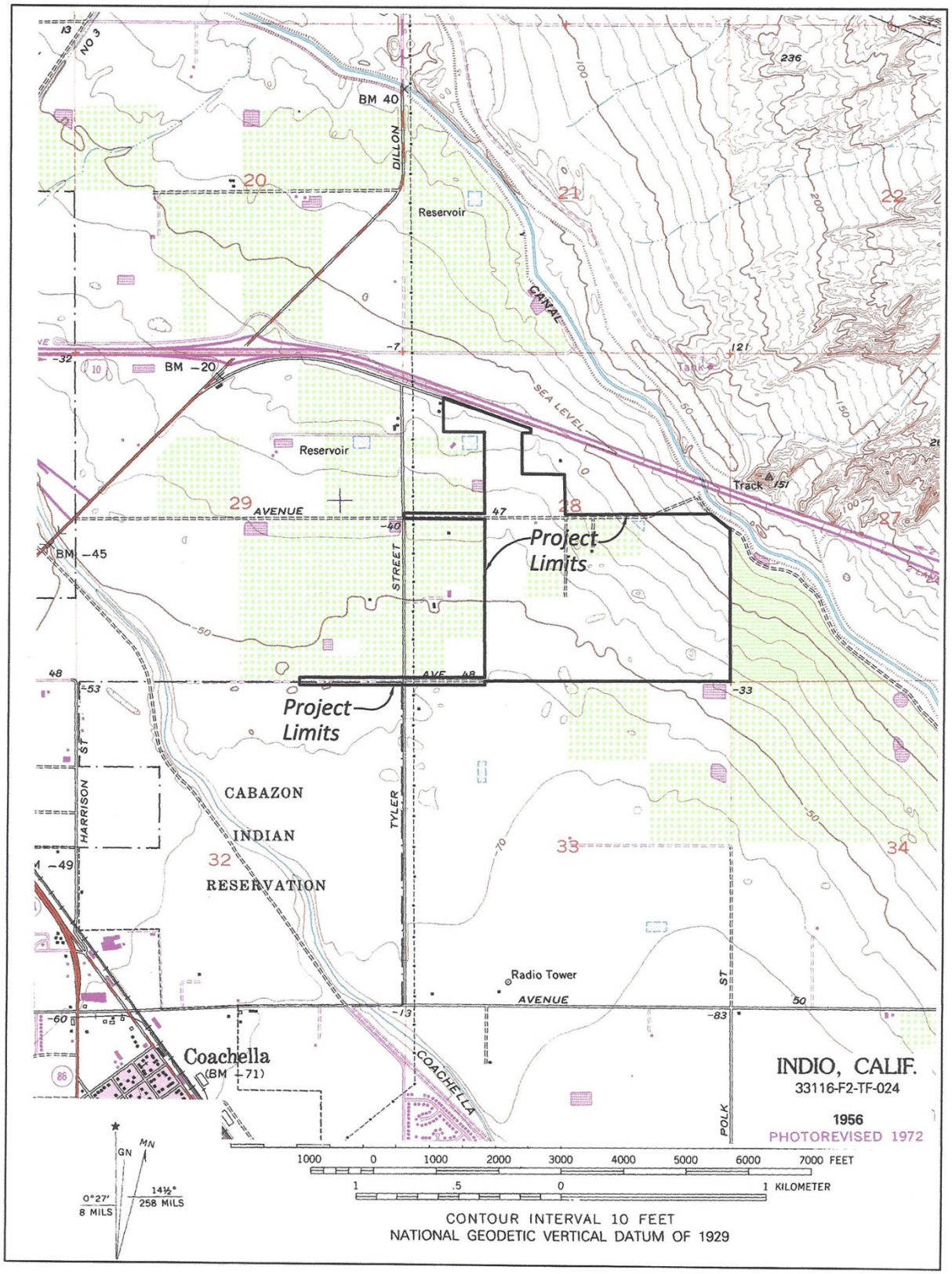


Figure 2: Project Location Map

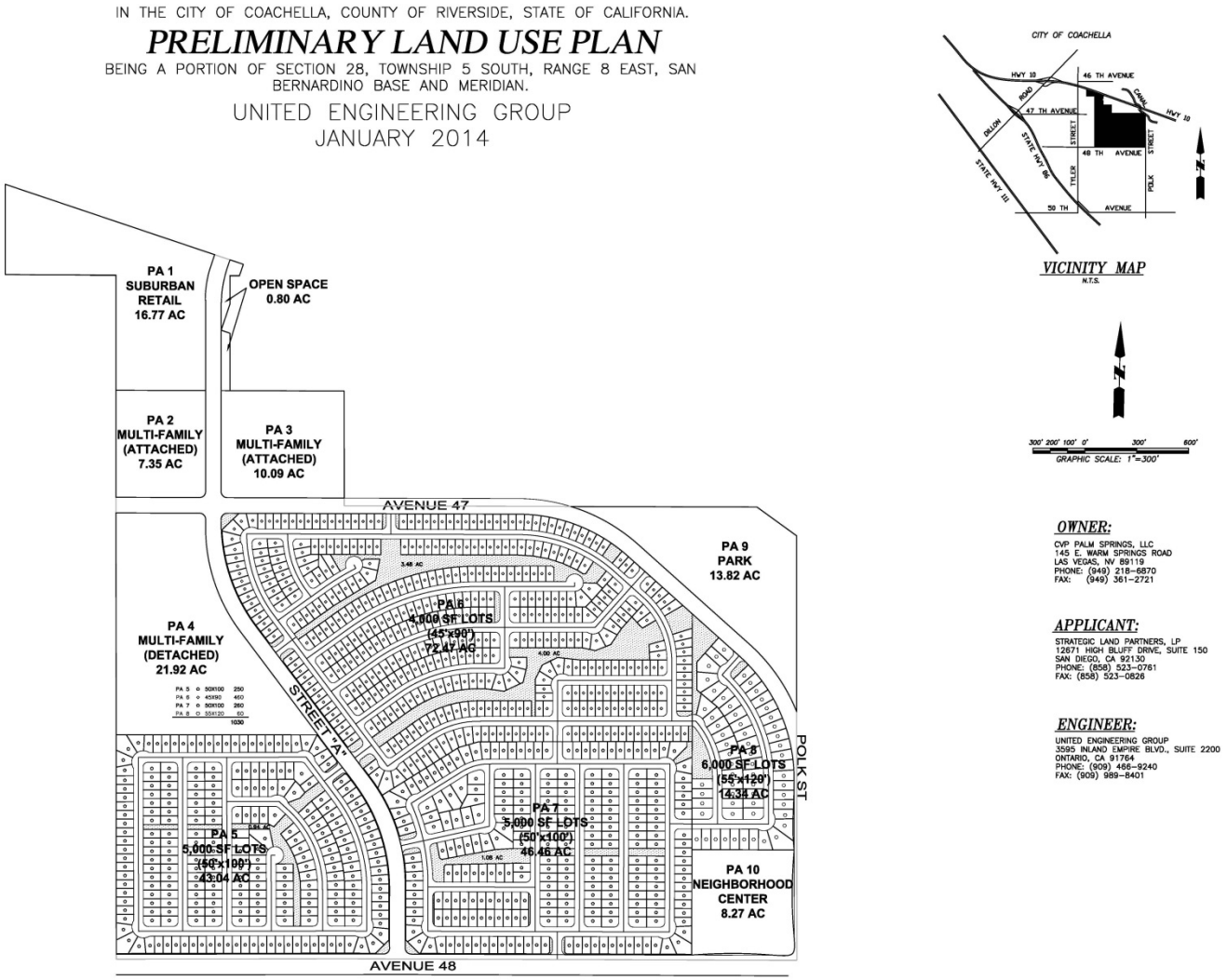


Figure 3: Preliminary Land Use Plan

In a letter dated May 26, 2006, Dave Singleton of the NAHC responded that no Native American sacred sites are present within or adjacent to the project area (see Appendix B). A list of tribal representatives that could be contacted was provided. Prior to the survey, Dr. de Barros contacted Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians and a representative from the tribal office of the Torres-Martinez Desert Cahuilla Indians to see if they would like to participate in the survey of the property. Both declined at this stage, but both wished to be informed when potential impacts to cultural resources were determined.

On April 29, 2014, a letter was sent or faxed to all of the tribal representatives on the list provided by the NAHC. This letter provided preliminary information about RIV-7834, -7835, and -7836 that underwent test excavations and significance evaluation in 2005, and concluded that RIV-7835 was a significant resource under CEQA. They were also informed about the preliminary results of the March 2014 resurvey, including that RIV-7834 and RIV-7835 were remapped with GPS and that the small site, RIV-7836, could not be relocated. They were also informed of the recording of water control features along Avenue 47 and a historic house foundation dating to after World War II.

Two responses were received. The first was a letter dated April 30, 2014, from Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians in Indio. She indicated that the project area was outside of current reservation boundaries, that they had no knowledge of any sacred/religious sites within or near the project area, and that they would defer to the Torres-Martinez Band of Desert Cahuilla for further consultation (see Appendix C). The second was from Mary Ann Green, Tribal Chairperson of the Augustine Band of Cahuilla Indians dated May 23, 2014. She said they are unaware of specific cultural resources within or near the project area, but encouraged us to talk to other tribal representatives and to be sure an Indian monitor is present during construction. She also asked to be informed about the discovery of any cultural resources during the development of the project.

Additional email comments were received for the project after the submission of the Phase I report. These include an email dated December 30, 2014, from Chris Devers, Cultural Clerk for the Pauma Band of Luiseno Indians and an email dated March 4, 2015, from Katie Eskew, archaeologist, from the THPO's office of the Agua Caliente Band of Cahuilla Indians. Mr. Devers deferred "any knowledge of cultural related sites or resources to our sister Bands of Cahuilla." Ms. Eskew stated the project is not within the Agua Caliente Reservation but is within the "Tribe's Traditional Use Area" (TUA) and requested of a copy of the relevant cultural resources reports. Finally, Shawn Muir of the Twenty-Nine Palms Band of Mission Indians Tribal EPA office in Coachella sent an email dated February 17, 2015, requesting a copy of the EA or EIR associated with this project.

Phase II testing took place in stages, and included fieldwork on November 21 and 23, December 6-7 and 29-31, 2014, with additional work completed on March 7, 2015. For the work in November, requests for Tribal Monitors were made by phone to Judy Stapp, Director of Cultural Affairs for the Cabazon Band of Mission Indians, and to Mary Ann Green, Tribal Chairperson of the Augustine Band of Cahuilla Indians, but they both stated they did not have any trained monitors and they indicated we should contact the Torres-Martinez Indian Reservation (Torres-Martinez Desert Cahuilla Indians).

A call was placed to the Torres-Martinez' Planning Director, Roland Ferrer on November 21, 2014 (Appendix B). Mr. Ferrer returned the call that same day and requested a copy of the initial Phase I report. This report was submitted to the City of Coachella before an additional 4300' of water, sewer, and road improvements were added, largely offsite. The subsequent survey of these improvements did not reveal any additional prehistoric cultural resources. After discussing the project with Mr. Ferrer, Dr. de Barros sent the initial Phase I report and summarized its results via email. He also summarized the results of initial test excavations that took place on November 21 and 23 and requested an Indian Tribal Monitor to monitor test excavations that were to take place on December 6-7. Unfortunately, Mr. Ferrer did not receive the report or email and as a result no monitor could be provided on those days.

Robin Lawson was eventually sent as a tribal monitor for the test excavations that took place on December 29-31 to investigate an intact hearth discovered on December 7th. Mr. Lawson monitored on December 29-30 and was extremely helpful, including his discovery of additional surface pottery that had been exposed due to a brief rain the week before. This led to additional surface collections and additional test units to cover the expanded Locus C. Later, it was determined that another day of additional testing would be necessary to better understand the nature of the hearth complex. Dr. de Barros requested that Mr. Lawson come on March 7th for a half-day of fieldwork, but he was unable to come on that date. This concluded the fieldwork at RIV-7834. Finally, after the collection of ceramics and charcoal were analyzed and the site was dated, a preliminary summary of the results was sent to Roland Ferrer on May 4, 2015, prior to the completion of the Phase II report (Appendix B). To date, no response has been received.

1.4 CURATION

The field notes, photographs, artifacts and ecofacts recovered from the Phase II archaeological excavations at CA-RIV-7834 will be curated in the Archaeology Laboratory at Palomar Community College in San Marcos, San Diego County.

SECTION 2 – NATURAL AND CULTURAL SETTING

2.1 NATURAL SETTING

2.1.1 Topography, Hydrology, Geology and Soils

The 277-acre parcel is located in the northeastern part of the City of Coachella in Riverside County, California. The study area is within the Colorado Desert Region in the heart of the Coachella Valley at an elevation ranging between -40 below and 30 feet above sea level. The site topography is relatively flat to the west but does slope upwards about 25 feet in elevation to the northwest. In the south central and eastern portion of the project, the property slopes upward from about -60 feet below sea level to 25 feet above sea level (see Figure 2). The town of Thermal is about four miles to the south and the larger City of Indio is about two miles to the west. The Augustine Indian Reservation is 0.5 miles to the southeast, the Cabazon Indian Reservation about 0.25 miles to the west, and the Torres-Martinez Indian Reservation about 8-9 miles to the southwest. The Mecca Hills, which reach a peak elevation of 1,648 ft. (Mecca Hill), are 4-5 miles to the southeast. The Indio Hills begin 2-3 miles to the north at elevations of a few hundred feet but later attain elevations over 6500 feet to the northwest. Further to the east are the Little San Bernardino Mountains which attain elevations over 3,000 feet. The town of La Quinta and the Santa Rosa Mountains are 7-8 miles to the west and southwest, respectively. These impressive mountains, including a State Game Refuge, attain elevations of over 4,000 feet.

The Whitewater River, tamed by the Coachella Storm Water Channel, is the principal watercourse of the Coachella Valley and is about 0.75 mile southwest of the subject property. As such, the southwest part of the property is within the potential floodplain of the river; however, the river tends to have water only after major rainstorms. The Coachella Canal is directly adjacent to the northeast corner of the property. Other local watercourses are extremely ephemeral and come primarily from the mountains to the east.

The subject property was once under the waters of prehistoric Lake Cahuilla due to periodic infillings of the Salton Sink or Trough by the Colorado River. Over the last 2000 years, there is evidence for natural infillings between about A.D. 700 and 890, 1000 and 1200, 1210 to 1420, 1430 to 1580 (Waters 1983, 1997:229), with the last occurring during the 1600s (Schaefer 1994a; Brock, Smith, and Wake 1999; Laylander 2006). With each infilling the lake level stabilized at an elevation of 12 m (40 ft.) as excess water flowed through an outlet channel to the south, creating a lake that was up to 95 m in depth covering a surface area of more than 5,700 km^2 (Waters 1997:229). Each infilling took from 12 to 20 years, and if no further water was supplied by the Colorado River, it took about 60 years to become completely desiccated. Each time this meant major regional changes

within one to three generations (Waters 1997:229). Waters (1997:229) also addresses how this would have affected archaeological site creation and burial:

> Because the lake rose to the same level each time, evidence of human use along the littoral zone during high stands of the lake is compressed onto the surface of a single shoreline. Buried sites are encountered below the shoreline where people camped on the dry lakebed whenever the lake level fell or the lake dried up. In many cases these sites became buried by alluvium shedding off the hillslopes and later by laminated lake basin sediments during a subsequent rise in lake level . . . These sites were protected and preserved from the shoreface erosion associated with a later transgression of the lake because the overlying alluvium was thick and the lake rose rapidly.
> (Waters 1997:229)

As a result, any essentially surface artifact deposits within the project area are likely to be 350 years old or less; however, buried archaeological sites could reflect ancient shoreline occupations as the lake dried up between infillings (see also Dice and Messick 2005:10).

Geologically speaking, the Coachella Valley is in the northern part of the Salton Trough or Salton Geomorphic Province. The San Bernardino Mountains and the Little San Bernardino Mountains, which are part of the Transverse Ranges, form the western and northern boundaries of the trough. These mountains are made from igneous plutons and metasedimentary rocks from the Paleozoic and Mesozoic Eras that were uplifted along the San Andreas Fault during the Pleistocene (Trent 1984; Keller 1995; see also Alexandrowicz and Krautkramer 2004:6). Coachella Valley soils are primarily alluvial and consist of decomposed granitic particles, very fine silty sand and occasional bits of granitic rock. Prior to agricultural development, the area was comprised of dunes, pans, alluvial fans and bajadas (Trent 1984). The four soil series found within the project area are typical of the Coachella Valley; they include Coachella fine sand, Gilman fine sandy loam, Myoma fine sand, and Carsitas cobbly sand (USDI 1972; see Dice and Messick 2005:8).

2.1.2 Climate and Vegetation

The study area lies within the Low Desert climatic zone. The climate is very dry, warm, and sunny with rainfall generally less than five inches per year with a mean maximum July temperature of over 100 degrees Fahrenheit (Bailey 1966:42). Most of the subject property was once covered by Sonoran creosote bush scrub and saltbush scrub with the latter more common in the southern portion of the property. The eastern 30% of the property is currently covered with vineyards as was the case during the 2005 survey (Dice and Messick 2005:9). In addition, historical area photos (especially between 1953 and 1984) indicate the central area of the project area south of Avenue 47 was also used for agricultural

purposes, with some continuing until at least 2002 (see Dice and Messick 2005:3), which despite some regrowth, destroyed the indigenous habitat. Vestiges of the original indigenous vegetation were described in 1980 by Swenson, Davis and Wilke (1980) who noted the presence of honey mesquite, California fan palm, arrowweed, and dense growths of quail brush on the Augustine Indian Reservation a few miles to the southwest. The indigenous inhabitants of the Coachella Valley, the Cahuilla, exploited regional resources ranging from the desert to the upper reaches of the Santa Rosa and Little San Bernardino Mountains (Figure 4).

2.1.3 Historic Land Use

Topographic maps produced before 1945 (see Section 2.2.2 below) show virtually no development or cultural features east of the Southern Pacific Railroad line. While prehistoric Indian plant gathering and hunting may have taken place in this area, agricultural and residential living would not become possible prior to the completion of the Coachella Canal in 1949, which led to a land boom linked to the water system developed in the early 1950s. Land use has since then primarily agricultural with some light residential housing. Farming activities have stripped off the natural creosote or saltbush scrub in many areas, although it has grown back substantially in some parts of the project area.

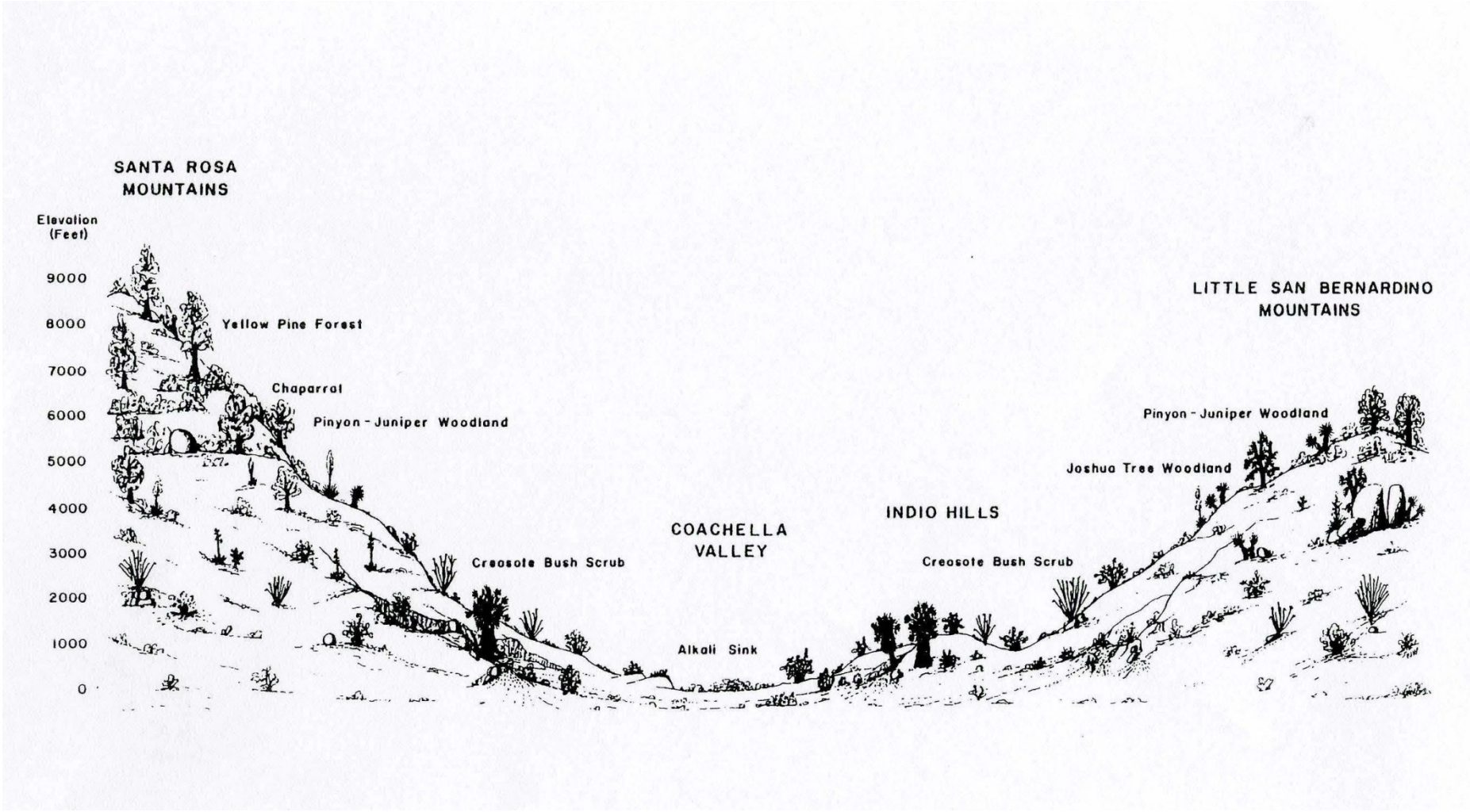


Figure 4: Vegetation Zones or Plant Communities in the Vicinity of the Coachella Valley.
[Source: Swenson et al. 1980:Figure 3]

2.2 CULTURAL SETTING

2.2.1 Prehistory and Ethnography

Culture Chronology/History of Southern California and the Study Area

The earliest period of human occupation in North America currently accepted is called Period I by Wallace (1978). It is dated from approximately 12,000 - 6,000 B.P. This period has been called San Dieguito, Playa, or Lake Mojave in Southern California (see Warren and Crabtree 1972). The last term is the one used to describe the culture complex in the Mojave River sink region. Lake Mojave Culture is characterized by Silver Lake and Lake Mojave projectile points and corresponds to post-Pleistocene conditions that were cooler and wetter than the present. As such, the Lake Mojave Complex is best seen as part of a larger regional adaptation. Bedwell (1970) has proposed the term Western Pluvial Lakes Tradition. It is characterized by (a) site locations near major water sources, (b) an absence of ground stone, (c) a flaked stone industry with long stemmed points, and (d) a stone tool kit which included large core and flake scrapers, scraper-planes, choppers, and hammerstones (see Altschul et al. 1985:24).

This early culture, also known as the Early Hunting Stage, represents the post-Pleistocene adaptation to big game hunting of large mammals, possibly even members of the late Pleistocene megafauna, such as the mammoth, although direct evidence of this type of aboriginal exploitation is lacking from southern California. If gathering was also part of this early subsistence strategy, plants were apparently not being processed with a ground stone technology. This early hunting tradition basically came to an end around 6000 B.P. This is probably due to the advent of much warmer and drier times associated with the Altithermal which led to a shift in subsistence strategies focused on plants and small game.

Wallace's Period I has not been well documented within the study area.

The following period, termed the Millingstone Horizon (Wallace 1955) or Archaic or Encinitas Tradition (Warren 1968), dates from approximately 6000 B.C. to 1000 B.C. This period includes Warren and Crabtree's (1972) Pinto Period (5000-2000 B.C.) and the early part of their Gypsum Period (2000 B.C. to A.D. 500; see Warren 1984:410). This horizon marks the technological advancements of seed grinding for flour and the beginning of the use of marine resources on the coast. Diagnostic artifacts for this tradition include manos, metates, scraper planes, choppers, core tools, doughnut stones, discoidals, and cogstones. This period includes archaeological cultures/complexes such as Pauma, La Jolla, Topanga, Oak Grove, and Sayles (cf. Moratto 1984). This period was not homogeneous either from a synchronic or diachronic perspective. The La Jolla (Wallace 1955) or Encinitas Tradition (Warren 1968) reflected a shift in the economy from one based primarily on hunting to one of seed and shellfish collecting. The assemblage is characterized by the use of millingstones, flaked cobble tools, retouch flakes and flexed burials.

Little is known of settlement in the study region during the Pinto Period. The earliest archaeological documentation of inhabitants in the Coachella Valley appears during the Gypsum Period which, along with the Saratoga Springs Period (A.D. 500 -1000), is also known as the Late Archaic (ca. 2000 B.C. to A.D. 900) in the desert and the Intermediate Period in coastal southern California (Moratto 1984; Wallace 1955; Warren 1968). Artifacts that are diagnostic of the Late Archaic include Humboldt, Gypsum Cave and Elko dart points and manos and metates, with the introduction of mortars and pestles to process mesquite beans and acorns coming later. Sites associated with this preceramic period in the Coachella Valley have been found in Indio, La Quinta, Indian Wells, and Coachella (CA-RIV-6797)(see Brock 2002 for a summary of these sites; see also Demcak 2005:4).

The Late Prehistoric period began around the latter part of the ninth century A.D. and continued until historic contact. It was called the Shoshonean Period by Warren and Crabtree (1972) and is also known as the Protohistoric Period. The period is characterized by three basic shifts in the economy of coastal populations: (a) a more land-based collecting economy; (b) collection of specifically-targeted shellfish resource areas and (c) the development of a quasi-maritime economy (True 1966). Archaeologically the period is characterized by the introduction of the mortar and pestle, finer projectile points, cremations, and the introduction of pottery ca. A.D. 1400.

Work by Wilke (1978) in the Coachella Valley indicates that the Desert Cahuilla are descendants of people that occupied the northwest shores of prehistoric Lake Cahuilla between ca. A.D. 900-1500. His analysis of 109 human coprolites indicates exploitation of open water, marshland, and low desert scrub resources, as well as some use of montane resources. Weir fishing was common along the shoreline. The 45 food resources he documents (Wilke 1978:89) indicate a heavy reliance on fish, aquatic birds, freshwater mussels, cattail, bulrush, goosefoot, witchgrass, mesquite, pinyon, and jackrabbits (see Swenson et al. 1980:9). Wilke dates the desiccation of the last major stand of Lake Cahuilla to the 1500s; however, more recent research indicates that the desiccation to which he refers took place in the 1400s, followed by a dry lake bed in the 1500s, and finally another brief infilling period and subsequent desiccation in the 1600s (Laylander 2006; Brock et al. 1999).

According to Wilke (1978)109-113), weir fishing was no longer possible when the lake level reached ca. -100 feet below sea level. He argues that lake desiccation led to migration to the upland areas to the west and northwest of the desert, i.e., the Santa Rosa and San Jacinto Mountains. O'Connell et al.'s (1974) study of the Perris Reservoir area on the plain west of the San Jacinto Mountains documents a substantial increase in population during approximately this period or periods (Swenson et al. 1980:9). Wilke (1978:109-125) believes the Cahuilla reoccupied the Coachella Valley once large stands of mesquite had been able to develop within the former prehistoric Lake Cahuilla lakebed, and he believes this occurred within 100 years after the period of desiccation. If this estimate is correct, current

data on lake levels suggest this would have occurred for a brief time during the late 16th century and once again toward the end of the 18th century, not long before European settlers first passed through the region in 1823.

The Late Prehistoric period can be said to have ended with the Spanish colonization and establishment of the missions. Disease and forced relocation, which reduced the populations considerably among the coastal settlements, did much to destroy the cultural pattern established at that period (Bean and Shipek 1978). The Late Prehistoric culture patterns lasted longer among the inland groups as mission policies, especially those of Mission San Luis Rey, were to maintain traditional settlement patterns and economic practices. The Cahuilla were relatively far removed from the coast and the Coachella Valley saw little or no contact with EuroAmerican settlers until 1855.

The Cahuilla with a Focus on the Desert Cahuilla

In the project area, the inhabitants were the Desert Cahuilla (Strong 1987:36-87; Bean 1978). The Desert Cahuilla, along with their brethren the Mountain and Pass Cahuilla, were bounded by the Serrano to the north, the Luiseño and Cupeño (when they were at Warner's Ranch) to the west and southwest, and the Ipai-Tipai/Kumeyaay to the south. The Desert, Pass, and Mountain Cahuilla distinctions maintained by many ethnographers should not be seen as discrete, bounded units as intermarriage and family moves rendered them quite fluid (Swenson et al. 1980:10; Bean 1978). The Cahuilla speak a language that is part of the Cupan subgroup of the Takic family of Uto-Aztecan family of languages. A few native speakers remain and there is major effort to teach Cahuilla to the young to help preserve the language. Cahuilla is most closely related to Cupeño and Luiseño among neighboring Takic or Shoshonean languages (Bean 1978).

The traditional territory of the Cahuilla was very diverse with a variety of climatic and floral and faunal resources associated with mountains, foothills, and desert terrains (Bean and Saubel 1972: see Figure 4). Subsistence was organized around hunting and gathering and later some agriculture. Basic staples consumed in historic times included

> the two mesquites, honey mesquite and screwbean, goosefoot (*Chenopodium* spp.), pickleweed (*Allenrolfea occidentalis*), *Dicoria canescens* (Cahuilla awk-nish; Wilke, DeDecker, and Dawson [1979]), various cacti, agave (Agave deserti), pinyon nuts (*Pinus monophylla*), acorns (*Quercus* spp.), and other seed plants. These resources were gathered on the floor of the Coachella Valley, on adjacent mountain slopes, and in the higher mountains . . . Gathering and hunting territories crosscut the vegetation zones [see Figure 4. Such an arrangement, which seems to have been characteristic of all villages on the desert and San Gorgonio Pass, ensured that an array of resources would be available in different settings at different elevations throughout the year. Hunting was secondary .

> . . and jackrabbits (*Lepus californicus*), cottontails (*Sylvilagus* spp.), deer (*Odocoileus hemionus*), and bighorn sheep (*Ovis Canadensis*) were all taken with the bow and arrow. Smaller mammals, including a variety of rodents, were taken with traps, snares, and with fire (Bean 1972). (Swenson et al. 1980:16-17)

Agriculture was first observed in 1823 by Europeans who were part of the Estudillo-Romero expedition through the Coachella Valley in December (Bean and Mason 1962). Cahuilla gardens containing corn, pumpkins, squash and melons were observed at that time. Wilke and Lawton (1975) suggest that the evidence indicates crops grown in both the winter and in the summer and that irrigation by canal or ditch was employed on a small scale, probably along with pot irrigation in such an arid region. The locations of agricultural fields are also noted on La Croze's 1856 Government Land Office (GLO) plat map. Lawton (1974) has shown that agriculture was practiced for hundreds of years prior to the arrival of Europeans, basing this on the presence of cultivated plants and crop names in Cahuilla mythology. However, most agree that agriculture was primarily a complementary form of subsistence tied to a primarily hunter-gathering economy (Swenson et al. 1980:17).

Acorns were stored in large granaries whereas seeds were stored in ollas sealed with pine pitch. The latter were often placed in desert rockshelters or caves to serve as food sources for those out hunting or gathering or to serve as reserve food supplies for individual families (Bean and Lawton 1965; Brumgardt and Bowles 1981, as cited in Demcak 2005:5). Pottery vessels included cooking pots, small-mouthed jars, pipes, and ladles (Bean 1978; Bean and Lawton 1965). Basketry was also important among the Cahuilla for the fashioning of globular baskets with flat bottoms for storing or carrying small items, large cone-shaped baskets used with a net for carrying heavier items, shallow baskets for parching corn and seeds or for storage, and flat winnowing trays (Bean 1978). Cahuilla contacts with the neighboring Serrano and Gabrielino, as well as Luiseño, were important and included trade, intermarriage, ceremonies and sometimes conflict (Bean 1978).

The Desert Cahuilla village was a permanently occupied settlement and consisted of three to five exogamous patrilineages (Bean 1972; Strong 1987; Gifford 1918). Village population ranged from 75 to 200 or more (see Swenson et al. 1980:13; Bean 1978). The 1856 GLO plat map surveyed by John La Croze, and others maps of the same time period, recorded the presence of a series of Cahuilla settlements within the Coachella Valley and elsewhere, comprising most of the settlement of the Pass and Desert Cahuilla. These data have been graphically summarized in a map in Swenson et al. (1980:Figure 4) as shown in Figure 5.

Swenson et al. (1980) note that Wilke and Lawton (1975), Wilke (1978), Bean (1978), Strong (1929, 1987), and Harvey (1967) have all published maps showing

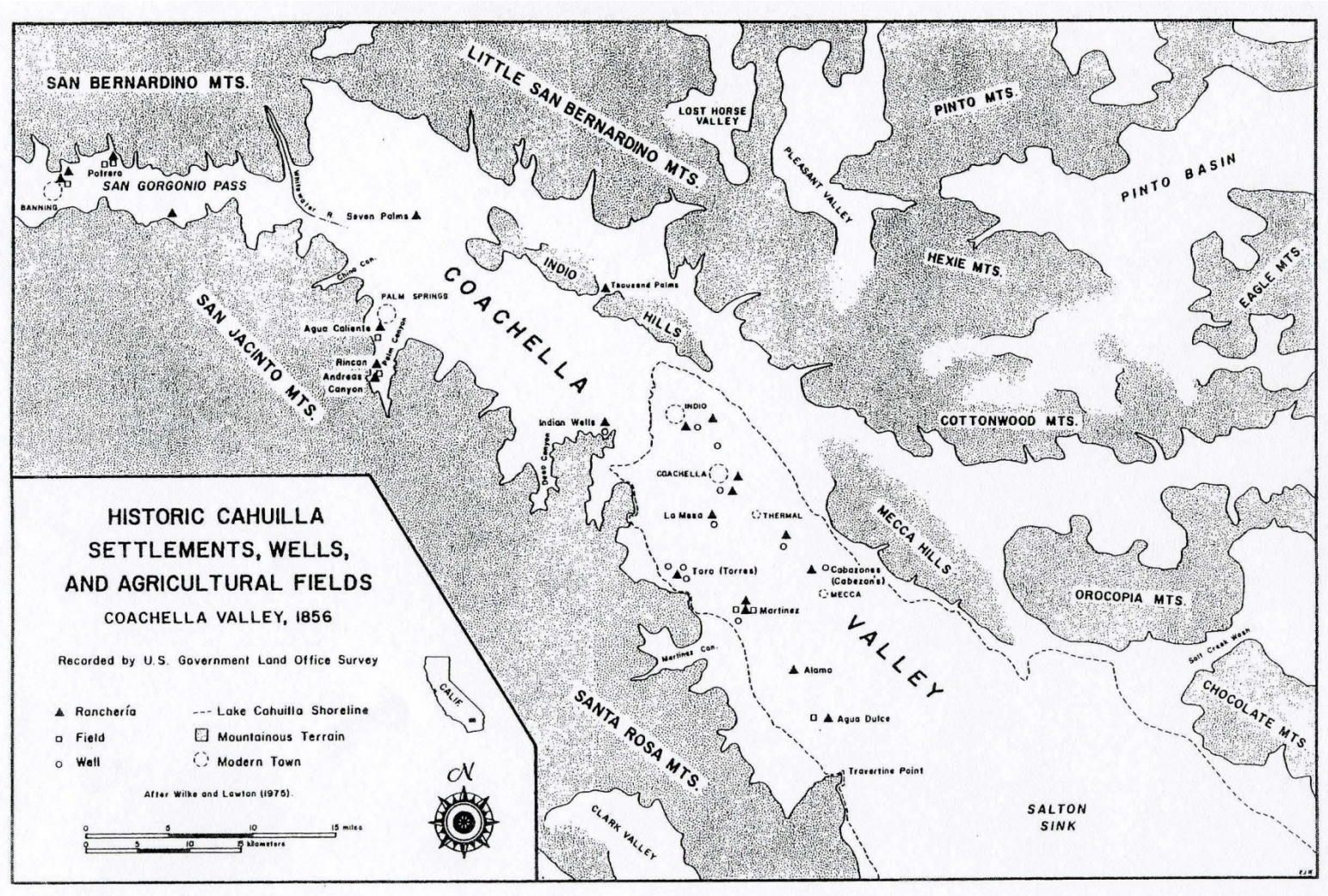


Figure 5: Cahuilla Villages/Rancherias and Associated Wells in the Coachella Valley and San Gorgonio Pass, 1856.
[Source: Swenson et al. 1980:Figure 4; after Wilke and Lawton 1975]

village locations in the various parts of Cahuilla territory. Their maps are not always in agreement.

> The reason for this seems to lie in the fact that locational data were made at a time when Cahuilla culture, like that of most other California Indians, was in a state of flux. Within a few years following regular contact with whites (immediately following 1855), Cahuilla population went into accelerated decline (Harvey 1967). Part of the reason for the decline was the skimming off of the young men and women (the effective breeding population) for laborers and servants on the ranches of the Los Angeles Basin, the San Bernardino Valley, and other places toward the coast. This was also a time of terrible epidemics of smallpox, measles, and other highly infectious diseases to which California Indians had no natural immunity. Epidemics swept the villages on the desert in 1863. When Cahuilla laborers in the ranches became ill, they probably went home, taking the disease with them. A table of population estimates for the Cahuilla, 1770-1970 (Bean 1978:584) shows that the epidemics of 1863 probably killed a minimum of one out of every two Cahuilla.
> (Swenson et al. 1980:11-12).

The links between these epidemics and shifting settlement patterns are instructive as Swenson et al. (1980) note:

> It was customary among the Cahuilla that when a person died his house was burned along with most of his personal belongings (Strong 1929; Bean 1972). A new house was then erected some distance away in a different part of the village . . . in the period of population reduction through epidemics. . . . the villages might . . . have changed locations by what might be called "settlement creep." A number of deaths in a village at one time might have led to the notion that the place was possessed by evil, and the entire village physically moved to another location nearby. The 1856 U.S. Land Office Survey (Wilke and Lawton 1975) noted an abandoned village in Thousand Palms Canyon already at that date.
> (Swenson et al. 1980:12)

As a result, several villages noted in various ethnographic and historic records may refer to the "same settlement as it gradually crept across the landscape" (Swenson et al. 1980:12).

Swenson et al. (1980) also discuss the association of Cahuilla settlement with hand dug wells that provided water from the shallow water table associated with the former prehistoric Lake Cahuilla lakebed (see Photo 1):

INDIAN WELLS SEEN BY BLAKE

This rare photo taken in 1902 at Torres Indian Reservation shows typical hand dug Indian well. Note path leading to the well with water level about 20-30 feet below ground surface. Laborously dug without implements by Indian women, Blake saw an example of it at Indian Well, west of Point Happy, in 1853 when he accompanied the railroad survey.

— Title Insurance and Trust Collection

Photo 1: Photograph of Indian Well at Torres Indian Reservation in 1902.
[Source: Title Insurance & Trust Collection as shown in Nordland 1978:37]

> The historic villages of the lower Coachella Valley [see Figure 4] were located on the bed of ancient Lake Cahuilla. Here the shallow water table permitted the excavation of conical walk-in wells for domestic water supplies. These were up to 30 ft. (9m) deep, but were often of depths ranging from 8 to 15 ft. (2.5 to 5 m). The shallow water table also gave rise to dense thickets of mesquite (*Prosopis glandulosa* var. *torreyana*). Villages were located among these mesquite thickets. For this reason also, the early observations of village locations may be somewhat in error, especially with regard to the possible presence of villages or parts thereof where they were not observed. That the village of La Mesa could be recorded at different times in adjacent sections meets with Bean's (1972:71, 74) description of Desert Cahuilla villages extending thinly across a radius of 2 to 3 mi (3.2 to 4.8 km), and with Blake's observation (1854:436) that the individual houses in a village were almost completely hidden in the dense mesquite thickets. (Swenson et al. 1980:12-13)

No Indian villages or rancherias were recorded in Section 28 of Township 5 South, Range 8 East on the 1856 GLO Plat Map, in part because it is more than a mile away from the Whitewater River where Indian settlement tended to be concentrated. On Henry Washington and John La Croze's southwest portion of the 1856 Plat Map, an Indian rancheria is recorded in Section 19 to the northwest of Section 28 about 0.25 miles east of the Whitewater River; and there is a well/spring mapped on the west side of the river in Section 30 to the west of Section 28 (see Figure 6). Such features are absent not only in Section 28, but also in the adjacent Sections 29, 32 and 33. By 1909, the rerecording of the same area by Lightfoot and Chubb shows the Southern Pacific Railroad west of the Whitewater River and the former Indian features are no longer present (see Figure 7). Blout and Pearson's 1911 Plat Map of the rest of Township 5 South, Range 8 East, also shows no Indian features, but does show some early settler's homes in Section 28 (see historical section below).

2.2.2 Regional and Local History

Here the focus is on the history of the City of Coachella and to a lesser extent that of the Coachella Valley. Research was conducted on May 26, 2006, at the Coachella Valley Museum and Cultural Center, with the assistance of archivist Kathy Papan, and at the Coachella Valley Water District, with the help of Communications and Legislative Director, Dennis Mahr. The Coachella Valley Water District's 1978 publication, *Coachella Valley's Golden Years*, compiled and written by Ole Nordland, was a particularly valuable resource.

Early History of the Coachella Valley: 1855-1900

The first important venture of Europeans into the Coachella Valley that would have lasting consequences was the actual mapping of the valley in the mid-1850s (see Figures 6-7). In 1862, human traffic became significant in the region

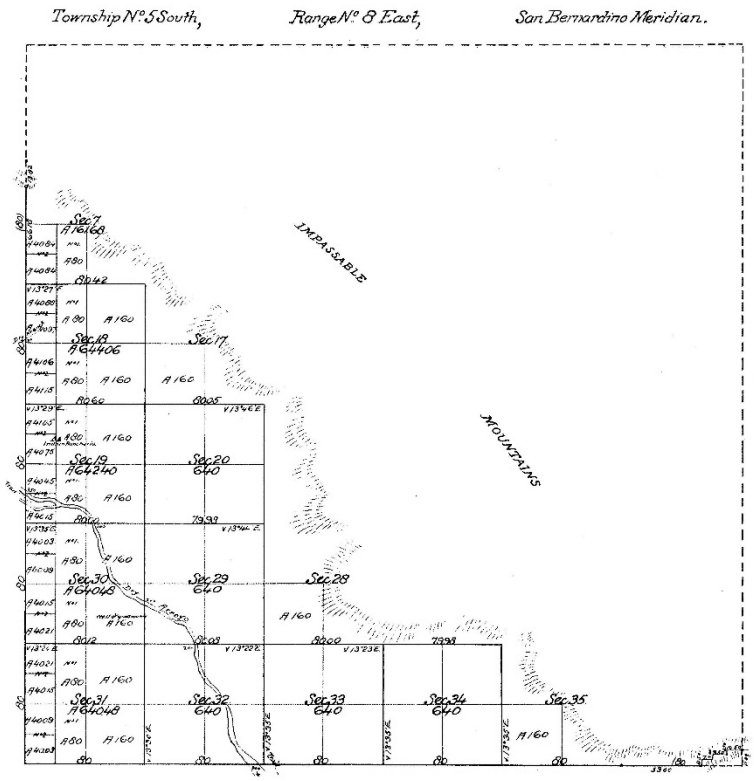


Figure 6: 1855-56 GLO Plat Map, Washington & La Croze, SW¼, Section 28

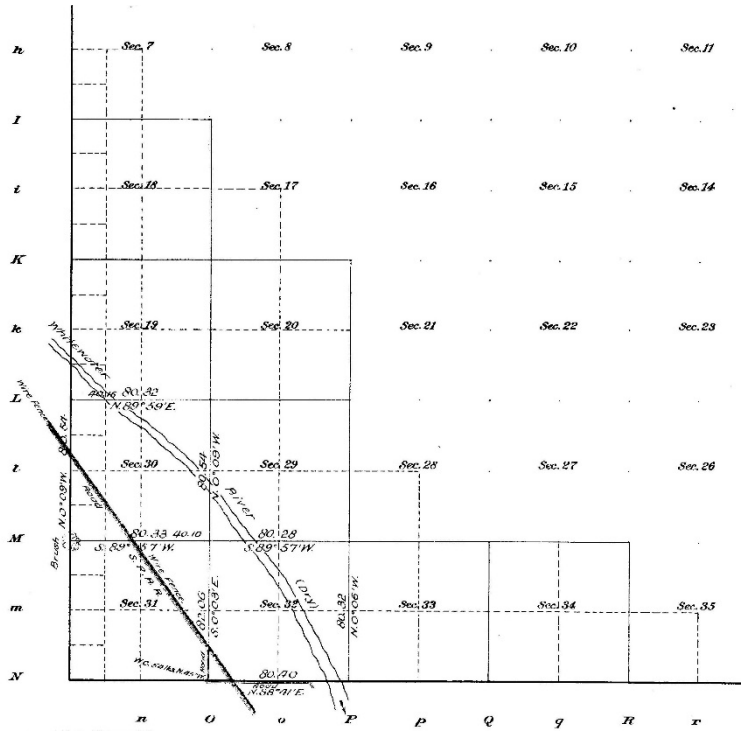


Figure 7: 1909 GLO Plat Map, Lightfoot & Chubb, SW¼ of Section 28

because of gold discoveries at La Paz along the Colorado River in January of that year. That same year William D. Bradshaw built a road through the valley to the gold fields and operated a freight line (Mahr 1971). The town of Indian Wells (later Indio) shows up on early maps of the region. However, the most significant development that led to settlement in the valley was the completion of the railroad from Los Angeles to Indio on May 29, 1876 (Nordland 1978:12), with a siding reaching Woodspur (later Coachella) in January of 1877 (Nordland 1978:14). The first commercial crop was shipped from Woodspur that same year and consisted of mesquite and greasewood harvested by local Indians that was sent to Los Angeles (Mahr 1971). The Southern Pacific Railroad (SPRR) line was completed to Tucson by 1880, El Paso by 1881, and New Orleans by 1883 and was known as the Sunset Route from Los Angeles to New Orleans (see Nordland 1978:103).

Well drilling by the SPRR at Indio, Woodspur, and Thermal in the 1880s produced small quantities of water, including an eight inch well drilled at Woodspur in 1880 (Mahr 1971). One of the first to homestead a farm in Coachella Valley was Patrick H. Gale in 1885 (Mahr 1971). Later SPRR attempts to find water hit an artesian well at Walters (later Mecca) in 1894 (Mahr 1971). This led to Mecca becoming the major commercial center of the Coachella Valley until around 1905, when it was eclipsed by Thermal and its growing ranches and homesteads. Thermal was a major center from 1905 to about 1912, when it was eclipsed by Coachella after the establishment of the First National Bank in that town in 1912 (*Coachella Valley Sun* 4/26/79). By the late 1920s, Indio would become the principal commercial center of the valley (*Desert Rancher* 2/69).

In 1896, Jack Holliday, a well driller from Norwalk, visited Woodspur and saw the low flow of the well there. He returned in 1898 with a rotary hydraulic well-drilling rig and put in a well near Vine and Third Streets within Grapefruit Boulevard along with a water tank (Laflin 1998:51)(see Photo 2).

Jason Rector and the Early History of the Town of Coachella: 1901-1946

Jason L. Rector was the first settler to build a home in Coachella. He was born in 1851 or 1853 in Iowa, and after going to private school, he worked for the postal service and later went into farming and real estate. In 1884, he came to San Diego where he was a butcher and then in the cattle business. Later, he took a position with the South Pacific Railroad Company and the A.N. Towne Estate to obtain and ship wood from the Coachella Valley area. He later established a mesquite wood terminal at the Woodspur railroad siding from where lumber was freighted to Los Angeles. He is also credited, along with his brother Lon B. Rector, with digging the first artesian well at the intersection of Grapefruit Avenue and Fifth Street in Coachella, which was 550 feet deep and took eight months to complete in November of 1900 [see Rector, Coachella Founder (2014:1-2) at http://www.coachella.org/about-us/history)].

He also was involved in the initial laying out of a townsite on his own land with the help of C. E. Mawby and other financial interests. He declined to have the town named after him and is said to have proposed the name Conchillla (but see below). In 1902 he became president and manager of the Coachella Valley Produce Association which shipped fruit for the first time by rail from the valley. In 1904, he built the first pre-cooling plant and created the Coachella Valley Refrigerating Company (Rector, Coachella Founder 2014:2-3).

> In 1904, the A.N. Towne Estate, under the Coachella Land & Water Company, caused the town to be platted, later selling out to Mr. Rector, who in turn sold to Strong & Dickinson. He, along with others, having previously installed a water system over two miles of pipe and planted all the ornamental trees gracing the town, made it an attractive business opportunity. . . . he later acted as the town's unofficial mayor . . . . and died on September 24, 1919, in Los Angeles [where he had a second home]. (Rector, Coachella Founder 2014:3).

The mining of salt was the largest industry in the area prior to the flooding of the Salton Trough by the Salton Sea in 1905-1907. Around 1900, some mining also took place in the hills to the north and east, mainly pit mines in search of gold, silver, and copper. The miners lived primarily in Mecca, which was then called Walters (*Desert Rancher* 2/69).

The first school district in Coachella Valley was created in Indio in 1897 (Nordland 1978:114).

As noted earlier, a railroad siding was built to Woodspur in 1877 at the present-day location of Highway 111 (Grapefruit Blvd) and Avenue 50, and a major well was installed there in 1898 (see Photo 2). In 1901, the Coahilla Land and Water Company was formed for the development of the Woodspur townsite. It was managed by I. H. Faye and J. L. Rector, a surveyor who laid out the townsite (Laflin 1998:51). It is during this period that Woodspur became known as Coachella, a name later extended to the entire valley.

The origin of this name is still somewhat of a puzzle (see *Desert Rancher* 2/69; Patterson 1969; Laflin 1998:51; Nordland 1978:67-68). In the 1800s, the term Coahilla, derived from the Cahuilla Indians, was used to name desert and valley areas in the region. However, USGS maps based on surveys in 1897-98 (*San Jacinto* 30' quad published in 1901) and 1901 (*Indio* 30' quad published in 1904) show terms like Conchilla Desert and Conchilla Valley, which refers in Spanish to "small shells," reflecting the presence of these freshwater shells in the old prehistoric Lake Cahuilla lakebed. However, the 1904 map also shows the SPRR Woodspur stop as Coachella for the first time. While the SPRR has no record of why this change was made, the generally accepted story, related by pioneer George White, is that those associated with platting the townsite of Woodspur wanted to change the name, particular Mr. Faye. A meeting was held

in the early summer of 1901 to decide what that name would be. It was attended by 17 settlers who had two different ideas. One group wanted to use the term Conchilla and other Coahilla. They comprised by taking parts of both words: COA(huilla) + (Con)CHILLA = Coachella. The spelling change was to make it easy to pronounce and remember. This name means nothing, but this would not be the first time such a town name was created. For example, in Riverside County, the town of Wildomar is the result of conjoining the first names of the three founders William, Don, and Mary (de Barros 2005a). The name of Coachella was given to the new U.S. Post Office created on November 30, 1901, and George Huntington served as its first postmaster (Laflin 1998:52). The Post Office was housed in Huntington's General Store (see Photo 4). Coachella became the official name for the town and the valley on all government maps by 1909, when it was approved by the USGS Board on Geographic Names on January 6, 1909 (Nordland 1978:67-68; Patterson 1969; Laflin 1998).

There were apparently two general stores in the early history of Coachella. Dennis Mahr (1971) states it was George Huntington who opened a general store in Coachella in ca. 1901 and later sold it to John L. Smythe in 1908 (Mahr 1971) (see Photo 3). Laflin (1998:52) states that Mr. and Mrs. Charles McDonald arrived in Coachella in 1901 and also built a general store in 1902 with the help of Manny Young, his partner (Photo 3). Mrs. McDonald also organized the first Sunday school in her home in 1902 and her husband Charles built the Presbyterian Church in 1907 (Laflin 1998:52). Laflin (1998:53) notes that John and Lucy Smythe bought out a half interest in the Huntington Store ca. 1909. Mahr (1971) says he purchased the Huntington Store in 1908.

In 1902, the first school in Coachella was opened, a one-room school with eight students (see Photo 2). By 1904 it had 34 pupils and was soon at the present-day site of the Palm View School which was built in 1926 and modernized in 1953 (Mahr 1971; Nordland 1978:31). In that same year, the Coachella Valley Presbyterian Church was first chartered on November 30 and its first true church building was completed in 1907 (*Coachella Valley Sun* 8/26/63; Laflin 1998:52). The first high school, Coachella Valley High School, opened on January 11, 1919, with 32 students (*Coachella Valley Sun* 9/26/79).

The McDonalds also built the Date Palm Hotel which opened in 1905. According to Lyle Pearson, most of the hotel was built by a local Indian named "Handy Frank." It was later closed for a time but was reopened as the Coachella Hotel in 1957. This "Landmark Hotel" was finally torn down in 1975 (*Coachella Valley Sun* 1/21/1975). Again in 1905, human error led to the creation of the Salton Sea as the Colorado River began to flood into the Salton Trough. The flow was not halted until early 1907.

Early crops in the Coachella Valley focused on cantaloupes with some vegetables, mostly onions. The first ice plant for cooling cantaloupes was created

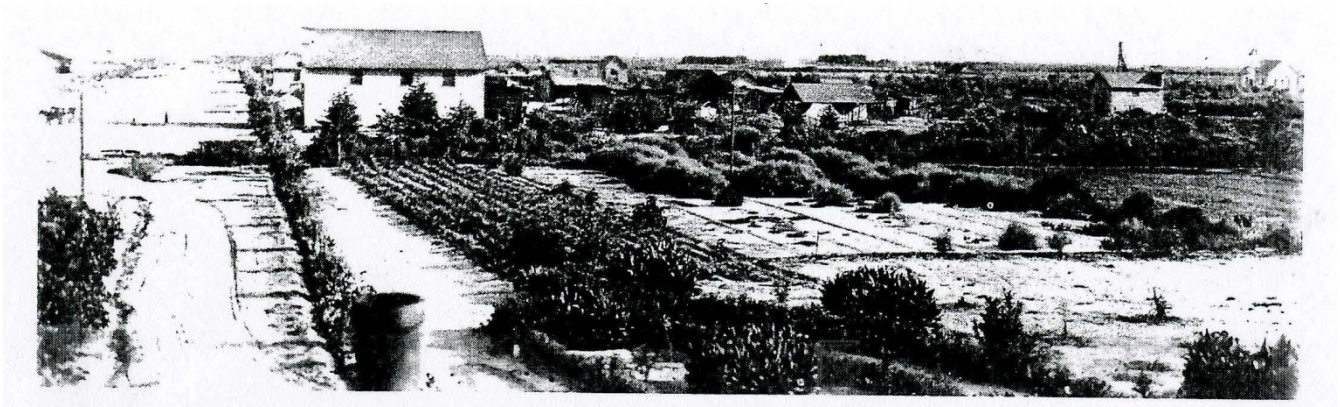


Photo 2: City of Coachella in 1903 looking South on Front St. on what is now Grapefruit Blvd (Highway 111). Note first Coachella School at far right and well in center of Grapefruit Blvd. drilled by the Southern Pacific Railroad in 1880 at what was then called Woodspur and later enlarged by Jack Holliday in 1898. [Source: A. L. Pearson Collection as shown in Nordland 1978:11]

Photo 3: Front St. in 1913, fronting on the railroad, later named Cantaloupe, then renamed Grapefruit Blvd. in the 1970s. *From left to right*: Dr. English, later Schwartz, Drug Store; the new First National Bank; and the McDonald & Young general merchandize, hardware and implement store. The first offices of the Coachella Water District were to the right of the bank. [Source: A.L. Pearson Collection as shown in Nordland 1978:35]

in 1905. At that time, over 2000 acres were in cantaloupes. Later competition from the Imperial Valley and the arrival of the melon aphis led to a switch to other crops with time (Mahr 1971). The first dates were brought from Algeria in 1883, but commercial production did not begin in the valley until 1906 and the volume was not significant until 1920 (*Desert Rancher* 2/69). An alternate source states that the first commercial planting of dates in the valley was by Bernard Johnson in Mecca in 1903 (Nordland 1978:51).

In early 1906, the Coachella Valley Home Telephone and Telegraph Company was created (Nordland 1978:69). The first office and switchboard was in Thermal, because it was midway between Indio and Mecca. The system initially linked Thermal, Coachella, Indio, Mecca, Flora del Valle, and the Martinez Indian Reservation (Nordland 1978:69). By 1912, toll calls could be made to other regions. The number of phones in service between 1906 and 1919 was between 100 and 120. Battery phones were completely replaced by dial phones in 1944 (Nordland 1978:69).

In 1912, the First National Bank was established in Coachella and is still there. Laflin (1998:53) says it was opened by Harry Westerfield from Banning (see Photo 3). However, Nordland (1978:28) says it was opened by his brother John M. Westerfield who had first opened a bank in Banning in 1901. His brother had come to Coachella to farm as early as July 1905.

In 1914, local power generators and two small local companies were replaced by electricity provided by the Southern Sierra Power Company which had lines built from San Bernardino to Redlands and then to the Coachella and the Imperial Valleys. The main distribution plant was in Coachella (Laflin 1998:53).

On March 7, 1914, at a Valley Road Meeting in Indio, it was decided to push for plans to divert water from the Whitewater River for irrigation (CVWD1993:2). On January 23, 1915, the Indio Levee District elected its first directors (CVWD 1993:2), and on May 14, of the same year, a valley-wide storm water district was created. Major flooding in January of 1916 provided further impetus to control floodwaters. Eleven miles of railroad were washed out; Coachella, Thermal and Mecca were under water; and miles of roads were damaged. The Whitewater River scoured a 50-ft deep channel into its former riverbed (Nordland 1978:20). On May 6, 1918, Dr. S.S.M. Jennings was elected as the first president of the newly formed Coachella Valley County Water District (CVWD 1993:5). Other major floods would occur in 1920 and 1927. One of the ultimate goals, aside from controlling floodwaters, was to build a Coachella Branch of the All American Canal. As discussed below, it would take 30 years to realize this project (Nordland 1978).

Photo 4: Huntington and Smythe General Store, Coachella's First Post Office. **[A.L. Pearson Collection as shown on cover of Nordland (1978)]**

Agricultural Production and the Push for the Coachella Canal

As noted above, early crops consisted of cantaloupes, grapes, other vegetables like onions, and later dates. In July 1917, 458 acres were in dates, 874 in alfalfa, 312 in grapes, and 3,908 acres in other crops for a total of 5,552 acres. Cotton did not appear until 1918 (Nordland 1978:46). As the water table sank, it became clear that irrigation water needed to be brought to the valley if it was to have a long-term future. Salt accumulation also became a problem. In 1927, alkali wells were sunk to depths of 11-32 ft. to monitor this salt accumulation, but the declining water table soon led to their abandonment. The problem was ultimately resolved using two approaches: 1) the ponding of water on the ground surface which leached and dissolved the salt forcing it vertically downward; and, 2) the development of underground farm tile drainage systems seven feet below the surface. More than 2,100 miles of such drainage systems have been created on 35,000 acres of land. The discharge waters are drained into the Salton Sea (Nordland 1978:58-59).

The City of Coachella's 30-year struggle to bring water to the Coachella Valley is recounted in some detail by Nordland (1978:2-11; 71-99; see also Coachella Water District's Special 75th Anniversary Two-Year Edition Review, *Review 1991-1993, Coachella Water District or* CWVD 1993). The first decade of effort culminated in the signing of the Swing-Johnson Bill -- the Boulder Canyon Project Act -- by President Hoover on December 21, 1928. It authorized three major projects: 1) the Colorado River compact stipulating how water from the Colorado River would be shared; 2) the building of a dam at either Black or Boulder Canyon (future Boulder or Hoover Dam), and the construction of the All American Canal connecting Imperial and Coachella Valleys, including a Coachella Branch. One of the main problems was whether a contract for the Coachella Branch ought to be inclusive in the contract for the Imperial Valley. Dissent about this issue led to the Water District board members being ousted on October 28, 1932 (Nordland 1978:77). A contract to build the All American Canal was finally signed in 1934 and Improvement District No. 1, which included Palm Springs, Indio, Coachella, Thermal and Mecca, was created in 1936. The building of the Coachella Branch of the All American Canal began in 1938 and the first water deliveries to the Coachella Water District occurred in 1948 (Nordland 1978; CVWD 1993).

This led to immediate increases in agricultural acreage in the valley. In 1936 14,599 acres were under cultivation (Nordland 1978:46); by 1947, it had jumped to 27,075 acres, with nearly 3000 acres planted in 1946 and 1947. By 1951, 39,515 acres were in production and 61,378 in 1958. Irrigated acres jump from 17,959 in 1947 to 67,000 acres in 1977 (Nordland 1978:46).

The pattern of crops changed over the years. The small truck gardeners of the 1920s and 1930s were gone by the 1940s. Most of the tomatoes, peas, onions, and other table vegetables of the 1940s were later replaced by other crops due

to competition with Mexico. The acreage in dates held steady through the 1970s despite the removal of acreage for subdivisions. Citrus varieties increased in importance but cotton acreage began to decline. In 1977, 67,000 of irrigated acres using Colorado River water provided 50 varieties of crops with a gross value of more than $110,000,000. The most important crops were grapes (7,600 acres), grapefruit and other citrus (17,000 acres), carrots (6,000 acres), cotton (4,000 acres), and dates (3,600 acres)(see Nordland 1978:44).

City of Coachella: 1946 to the Present

Early attempts to incorporate the City failed in 1920 and 1928. On November 26, 1946, incorporation efforts were successful and became official on Friday, December 13. The City Manager form of government was adopted in 1965 (Mahr 1971). The first mayor was John Westerfield from 1946-1950. He was from Omaha Nebraska and was President of the First National Bank where the first city council meetings were held. In the 1950s and 1960s, rapid residential growth outpaced commercial and industrial growth which led to the creation of an industrial park that contained major produce packing and shipping houses, an engineering firm, construction companies and other light and medium industries (*Periscope* 10/84). In 1956, Coachella had a population of 3,000 people and many oil companies had located offices there (*Date Palm* 2/16/56). From 1956 to 1964, the town's mayor was Henry B. Briggs. Briggs accomplished many things for the Coachella Valley and the City of Coachella during his life. He helped bring in bracero labor amidst severe labor shortages during World War II; he organized the Coachella Valley Farmers Association in 1943; as mayor, he formed the first volunteer fire department, brought in the first street sweeper, pushed through mandatory garbage collection, and encouraged housing subdivisions. He also suggested the use of tamarisk trees as windbreaks for the railroad and highways as they had been used in agriculture.

Coachella Valley schools united in a Unified School District in 1973, including elementary and high schools in Mecca, Oasis, Thermal, and Coachella (Nordland 1978:103).

As of January 1, 2009, Coachella had a population of 41,000 people, 97% of whom are Hispanic (City of Coachella 2014). In 1993, 1992 farm production totals were published by the Coachella Valley Water District (CVWD 1993:20). They showed that a total of 67,657 acres of irrigated farmland (including double cropping) involved the following crops: fruit – 38, 947 acres with the most important ones being grapes (15,930), grapefruit (8,226), dates (5,735), orange and tangerines (4,748), and lemons and limes (2,966); vegetables (20,519 acres), with the most important being sweet corn (4,761), other vegetables (4,000), lettuce (2,871), carrots (1,549), broccoli (1,219), beans (1,035), bell peppers (981), potatoes (874), squash (690) and onions (648); forage (7,046 acres) with the most important being sudan (2,940), alfalfa (2,313), and irrigated

pasture (1,612); and, finally, acres devoted to nurseries (929 acres). Coachella Valley produces over 90% of the dates in the United States.

The Subject Property

The GLO Plat Map of 1856 surveyed by John La Croze covered only the SW¼ of Section 28 and no natural or cultural features are shown. The same is true for the Lightfoot and Chubb GLO Plat Map of 1909 (see Figures 6 and 7). In December 1911, Blout, Pearson and Race surveyed the rest of the township, including Section 28. Their survey shows a cabin and N. Brais' house along a slightly meandering dirt road that would become Tyler Street in the NW¼ of Section 28 and another house just a bit further south along the same dirt road within the SW¼ (Figure 8). No structures or other cultural features are shown in the E½ of Section 28.

The 1904 USGS *Indio* 30' quad, based on surveys in 1901, shows no natural or cultural features east of the Southern Pacific Railroad line (Figure 9). This area was apparently not yet mapped as there was probably no permanent settlement at that time. Later the area is shown as mapped on the 1941 and 1943 15' *Coachella* quad maps produced by the U.S. Army Corps of Engineers, but no natural or cultural features are shown in Section 28 other than Highway 60 whose approximate route will later be followed by Interstate 10 (Figure 10).

The 1956 7.5' *Indio* quad shows the improved road, Tyler Street, the dirt road Avenue 47, and a small portion of dirt road Avenue 48 just west of the subject property. The Coachella Canal completed in 1949 is also in place and traverses the northeast corner of Section 28. Within the project area, a small triangular reservoir is shown just south of Avenue 47 and two structures are along dirt roads extending southwards from Avenue 47. The 1972 photorevision of the 7.5' *Indio* quad shows a third structure along the south side of Avenue 47 and Interstate 10 is now in place.

Homestead patent records for Section 28 from the Bureau of Land Management General Land Office Records website are summarized below in Table 1, with those fully or partially overlapping with the subject property shown in bold:

Table 1: Land Patents from Section 28, Township 5 South, Range 8 East

Name	Patent Date	Legal Description	Acres
Minnie Belle Hazel & William E. Patterson	11/2/1932	**N½ of NW¼**	80
George W. Ingram	7/13/1911	**SW¼**	160
Harry C. Isbell	5/28/1917	**S½ of NW¼**	80
Joseph H. Ramsdale	7/5/1917	**SE¼**	160
Note: No patents for the NE¼ which is also outside the project area.			

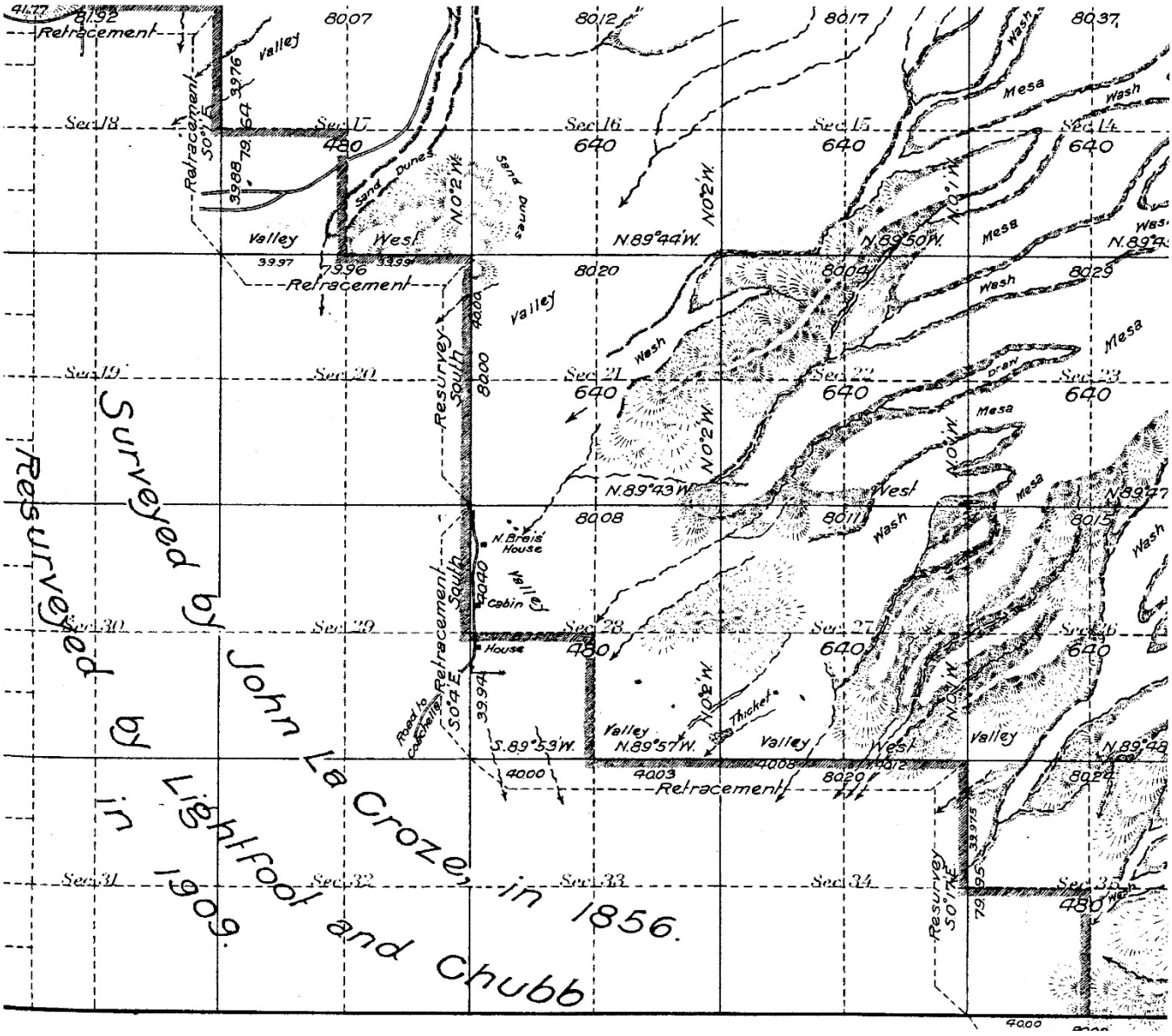


Figure 8: 1911 GLO Plat Map, Blout, Pearson & Race; Houses in W½ of Section 28

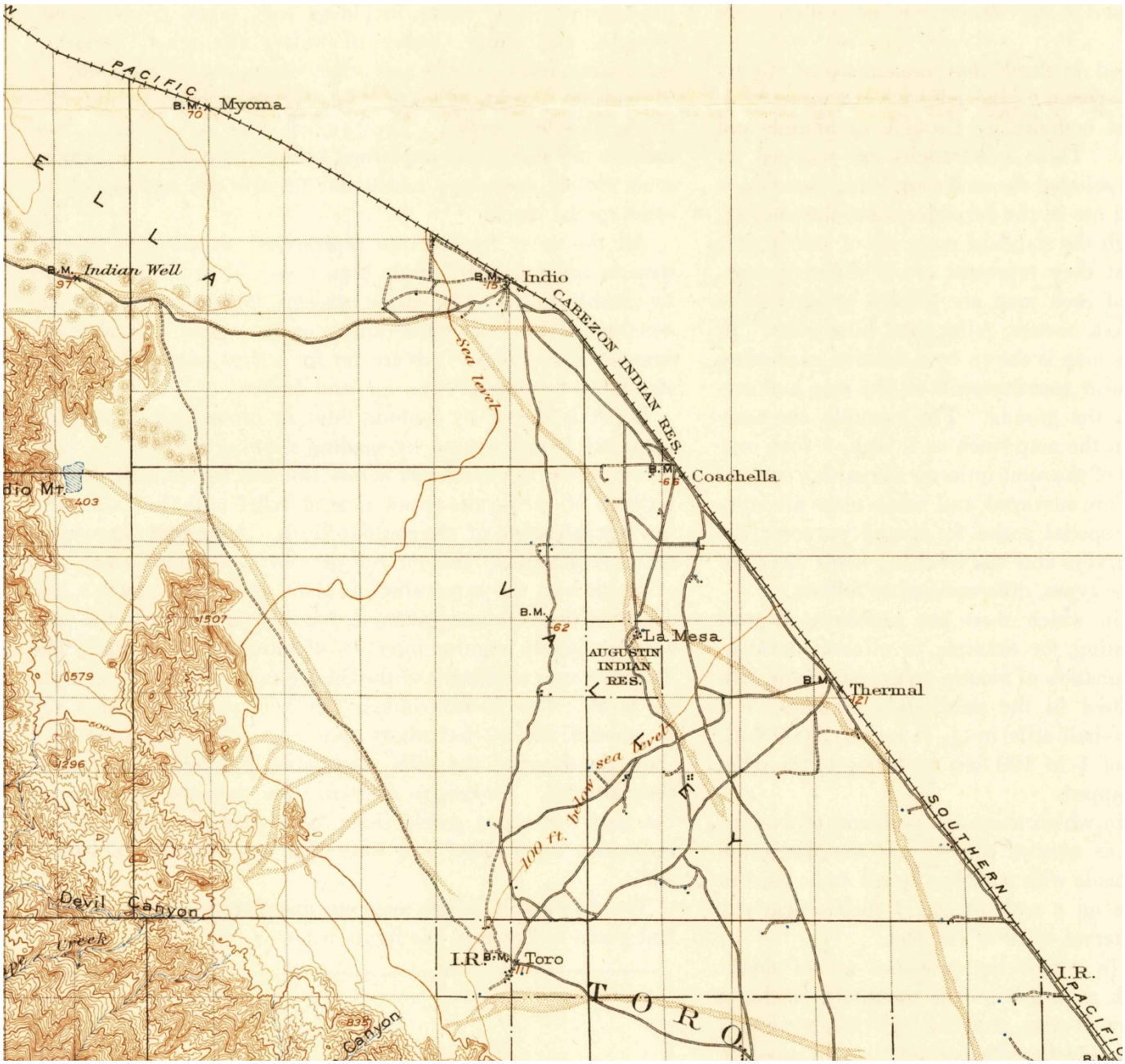


Figure 9: 1904 USGS 30' *Indio* Quad surveyed in 1901. East of the Southern Pacific RR was not mapped due to the lack of settlement and water.

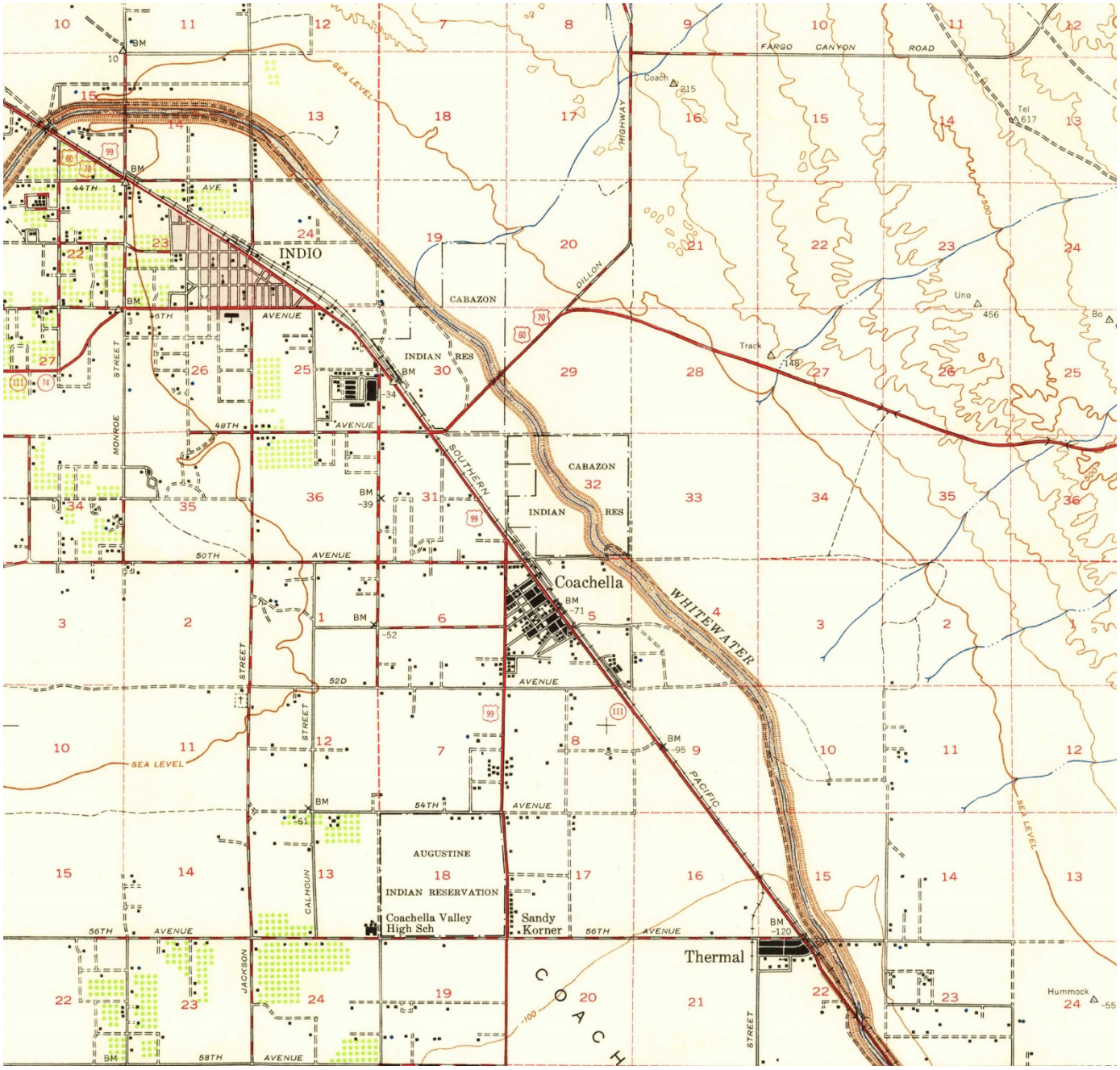


Figure 10: 1941 (and 1943) Army Corps of Engineers 15' *Coachella* Quad showing no Cultural Features in Section 28 (NE of Cabazon IR in Section 32).

All of these land patents date before World War II and any structures that might have been built to satisfy these patents apparently did not last as no structures are present on the 1941 and 1943 *Coachella* quads noted above. Section 28 and other areas east of Coachella and the Whitewater River do not begin to be seriously settled until after the construction of the Coachella Canal in 1948-49 and the completion of its underground water piping systems in the early 1950s.

The areas formerly patented by Hazel and Patterson and by Isbell are probably associated with the structures lying to the west of the project area in the NW¼ as shown on the 1956 (1972) 7.5' *Indio* quad. The structures west of the project area in the SW¼ are part of the original patent owned by George W. Ingram. Within the project area, there is one structure that was likely built between the late 1940s and 1956 in the SW¼, and a second one shown that was built between 1956 and 1972. Finally, there is a structure within the SE¼ on land formerly patented by Joseph H. Ramsdale that was also likely built between the late 1940s and 1956.

2.2.3 Previous Archaeological Research within Section 28

A 10-acre parcel in southwest corner of the project area was surveyed for possible improvements to water storage and water well facilities in 2001 by Leslie Mouriquand Hudson. One isolated sherd was found south of what was later recorded as RIV-7835 but it was not recorded (Hudson 2001).

In 2004, a 450-acre survey was conducted by Goodman and Mouriquand (2004) that included a large portion of Section 29 to the west, about 80 acres of the northeast portion of the Cabazon Indian Reservation in Section 32 to the southwest, and a 30-acre parcel in the SW¼ of Section 28. No sites were found within the Cabazon Indian Reservation area and none were found within Section 28. In Section 29 to the west, a small sherd scatter (RIV-7449), a small mixed artifact scatter (RIV-7450), a very small artifact scatter consisting of two fire-altered rocks and eight sherds (RIV-7451), and a highly dispersed ceramic scatter with five sherds (RIV-7452), as well as an isolate consisting of two sherds, were recorded.

In 2005, the entire project area was surveyed by Dice and Messick (2005) and three prehistoric ceramic scatters were recorded and tested: RIV-7834, -7835 and -7836. The authors also noted that they found two "historic structure remnants" that were "deemed too fragmentary and damaged to be granted cultural resource status" (Dice and Messick 2005:21). It is not known where these remnants were located but three structures within the project area shown on the 1956 (1972) *Indio* quad do not appear to have been investigated.

Dice and Messick (2005) evaluated all three ceramic scatter sites using test excavations and they determined that RIV-7834 and RIV-7836 were not significant under Section 106 of the National Historic Preservation Act or under

the California Environmental Quality Act (CEQA). RIV-7835 was determined to be not significant under Section 106 but was considered significant under the uniqueness criterion of the CEQA guidelines. These evaluations will be revisited later in this report.

Professional Archaeological Services (PAS), under the direction of Principal Investigator, Dr. Philip de Barros, conducted a Phase I resurvey of the original 277 acres and subsequently 4300' of largely offsite road, water, and sewer improvements (de Barros 2014). This resulted in the remapping of RIV-7834 and RIV-7835 and a reevaluation of RIV-7834, -7835, and -7836 (which could not be relocated) and recommendations for additional testing at RIV-7834. RIV-7835 was evaluated as significant and RIV-7836 was viewed as not significant (see Section 5 below). The Phase I survey also resulted in the recording of two major sets of water control features along Avenues 47 and 48 (RIV-11775 and -11817). These two were evaluated as not significant historical resources. Finally, an historic house foundation (RIV-11776) corresponding to one of the three structures shown on the 1956 (1972) *Indio* quad was recorded. The other two structure locations could not be relocated. Additional archival research and test excavations were proposed for RIV-11776 (de Barros 2014:76-77). These site evaluations will be discussed in more depth in Section 5 below.

2.2.4 Lowland Patayan Ceramic Chronology

Waters (1982) developed a Lowland Patayan ceramic chronology which is often used when analyzing the ceramics in the Coachella Valley and vicinity. The discussion below is derived from Waters (1982), Schaefer (1994a&b), Love and Dahdul (2002), Hildebrand (2003), and Dice and Messick (2005:11-12).

The Patayan Period begins at about 500 A.D. (1500 BP). What is sometimes referred to as the Coachella Valley Patayan is seen as an intrusion of Lower Colorado peoples to the prehistoric Lake Cahuilla (Lake Le Conte) shorelines that preceded or are precursors of the modern Cahuilla. This represents the introduction of both pottery and cremations into the area. The Lowland Patayan ceramic chronology is divided into three phases that may correspond with different infillings of Lake Cahuilla and associated changes in pottery types or varieties. Although the Coachella Valley was a major trade thoroughfare between the coast and the Colorado River and Arizona Deserts, little is known about the interaction between the Cahuilla and Coachella Valley Patayan groups (Waters 1982; Dice and Messick 2005:11).

The Patayan Period is also equivalent to the Late Prehistoric Period as discussed by Schaefer (1994b:29). Schaefer emphasizes that the Patayan cultural system is characterized by "cremations in ceramic vessels and numerous trail systems"; these trails may relate to resource procurement travel, trading and warfare and that shrines and pot drops are often along these trails (Schaefer 1994b:30; see Love and Dahdul 2002:72).

Whereas Waters (1982) described Patayan I as dating to AD 750-1050, Schaefer (1994a) uses dates from ca. AD 800 to 1050. During this time small mobile bands using ceramics settled along the Lower Colorado River using a tool kit similar to that of the Hohokam (Schaefer 1994b:30; see also Love and Dahdul 2002:72). Patayan II from ca. AD 1050 to 1500 is concurrent with a major infilling(s?) of Lake Cahuilla with new ceramic types appearing that were made by the local inhabitants. Populations moved away from the floodplain (now filled) to the east and west into the desert (Schaefer 1994b:30; Love and Dahdul 2002:72-73). The gradual desiccation of Lake Cahuilla about 500 years ago is associated with Patayan III (AD 1500 to historic times); however, recent data indicate later, at least partial infillings in the 17th century (AD 1650-1680) [see Laylander 2006; Brock et al. 1999; and Schaefer 1994a] and the introduction of Colorado Buff ware types (Schaefer 1994b:30-32; Love and Dahdul 2002:72-73; see also Schaefer 1994a:72).

More recent work by Hildebrand (2003) for the North Baja Pipeline Project, using radiocarbon dated stratified deposits, has demonstrated that direct rims are not only associated with Patayan I and are found in later periods. For example, Colorado Beige ceramics were found to cover the period from A.D. 870 to 1645 with a mean date of A.D. 1348 and, most importantly, the dated Colorado Beige rim sherds were direct, rather than recurved (Hildebrand 2003:258). He obtained similar results for Black Mesa Buff which was thought to be a Patayan I ceramic type for which he obtained dates from A.D. 1345 to 1645 with a mean date of A.D. 1517. The dated rim sherds were also direct for this Patayan II/III period (*ibid.*).

SECTION 3 - PHASE II RESEARCH DESIGN AND METHODS

This section only applies to sites where further archival research and/or test excavations were deemed necessary to complete the initial work of Dice and Messick (2005), based on the Phase I investigations (de Barros 2014). The sites include RIV-11776 and RIV-7834. A summary description of each site, including previous investigations, is provided before a discussion of a research design (as appropriate) and methods. The results are presented in Section 4. The final evaluations of all sites within the project area are summarized in Section 5.

3.1 RIV-11776: HISTORIC HOUSE FOUNDATION

3.1.1 Site Description; Evaluation and Recommendations for Further Work

This site consists of a damaged cement foundation of a former farm residence that was thought to have been built in the early 1950s with an associated propane tank cement slab and two trash scatters; the associated reservoir was apparently built after 1972 (see Figure 2; see also de Barros 2014). Preliminary archival research and the questioning of some of the local residents produced no information that indicates these structures are associated with any important event in prehistory or history or that they are associated with a significant figure in local or regional history, and its architectural features have largely been destroyed by a 2011 fire. Therefore this site did not appear to qualify as a significant historical resource under Criteria A-C under CEQA. As for Criterion D, its scientific research potential, there are two trash scatters associated with the site. Trash Scatter A is the product of the destruction of the house by fire in 2011 and contains buried burnt wood and what appears to be recent trash. Scatter B is mostly a relatively low density scatter that does not appear to be very deep based on informal trowel probes; however, there are a couple of areas that might have more dense subsurface deposits and the artifacts appear to be somewhat older than those in Trash Scatter B.

The Phase I report (de Barros 2014) recommended that additional archival research be conducted to ascertain when the house was built and to be certain the property was not owned by an individual significant in local history. It was also recommended that limited Phase II test excavations, especially in Trash Scatter B, be conducted to verify the depth, nature, and age of the trash scatter deposits and whether they have the potential to contribute significantly to our understanding of local history.

3.1.2 Methods

Archival research focused on a title search and evidence for improvements on the property in order to determine when the house was actually built, and who owned the property. This was done at the Riverside County Archives in Moreno Valley with a focus on assessor's records.

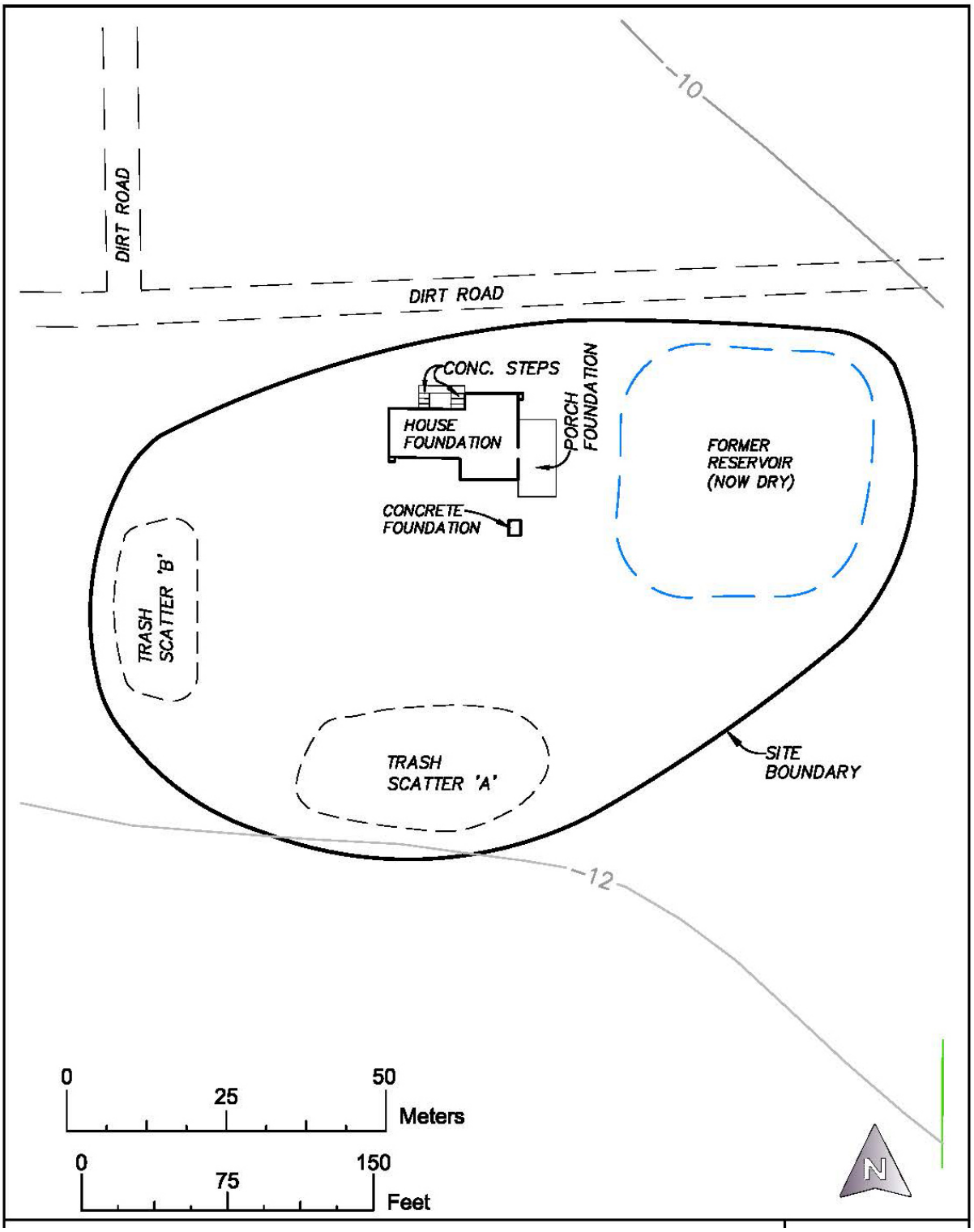


Figure 11: Map of RIV-11776

3.2 RIV-7834: PREHISTORIC CERAMIC SCATTER

A review of the Dice and Messick (2005) Phase II report in conjunction with the results of the Phase I resurvey in 2015 found a number of omissions and inconsistencies within the Phase II report and its contents compared with their site form (Dice 2005). The site form was significantly updated as a result. The site description below summarizes material in de Barros (2014:37-40) and the updated site form.

3.2.1 Site Description and Summary of Previous Investigations

Based on the Phase I survey, RIV-7834 consists of four ceramic scatter loci, Loci A-D (see Figure 12). Dice and Messick (2005) only recorded and tested Locus D. In 2005, 15 sherds were noted on the surface of Locus D (nine were collected), and their Phase II test excavations recovered 11 additional sherds. No other artifact types were noted.

The site is located just south of a creosote-covered sand dune 5-7 m in height in a formerly creosote scrub [and saltbush?], sandy landscape that has been disturbed, according to Dice (2005) and Dice and Messick (2005:20-21, 24), by its former use for viticulture between 1953 and 1984. Much of the natural vegetation has returned though saltbush clearly dominates over creosote and its density is probably lower than what it was prior to the agricultural disturbance. The soils consist of fine sandy loam and fine sands with pebbles and an occasional cobble. The 2005 site form's Archaeological Site Record states:

> A large creosote ring lies adjacent to the northern margin of the site. This ring is very old, but the creosote has mostly died off compared to a 1953 aerial [photo], possibly due to [a] dropping water table. The creosote ring must date to a time after Lake Cahuilla dried up.

This creosote ring is partially associated with the large sand dune 5-7 m in height noted above, just north of the site boundary. This may be a beach dune associated with a former stabilized shoreline of Lake Cahuilla (see Figure 2).

The site (Loci A-D) measures 240 m (NS) by 68 m (EW) and is between -45 and -30 feet below sea level in elevation, placing it within the lakebed of prehistoric Lake Cahuilla which normally filled to 40 ft. (12 m) above sea level. The site is about two km northeast of the Whitewater River.

Prior to the test excavations in Loci A-C, the four ceramic loci at RIV-7834 were described by de Barros (2014:38-40) as follows (see Figure 12):

Locus A measures 68 x 21 m and includes 20 surface pottery sherds. Most are clustered in the northwestern end of the locus, including one cluster of three sherds and another cluster of 11 sherds that may represent a pot drop.

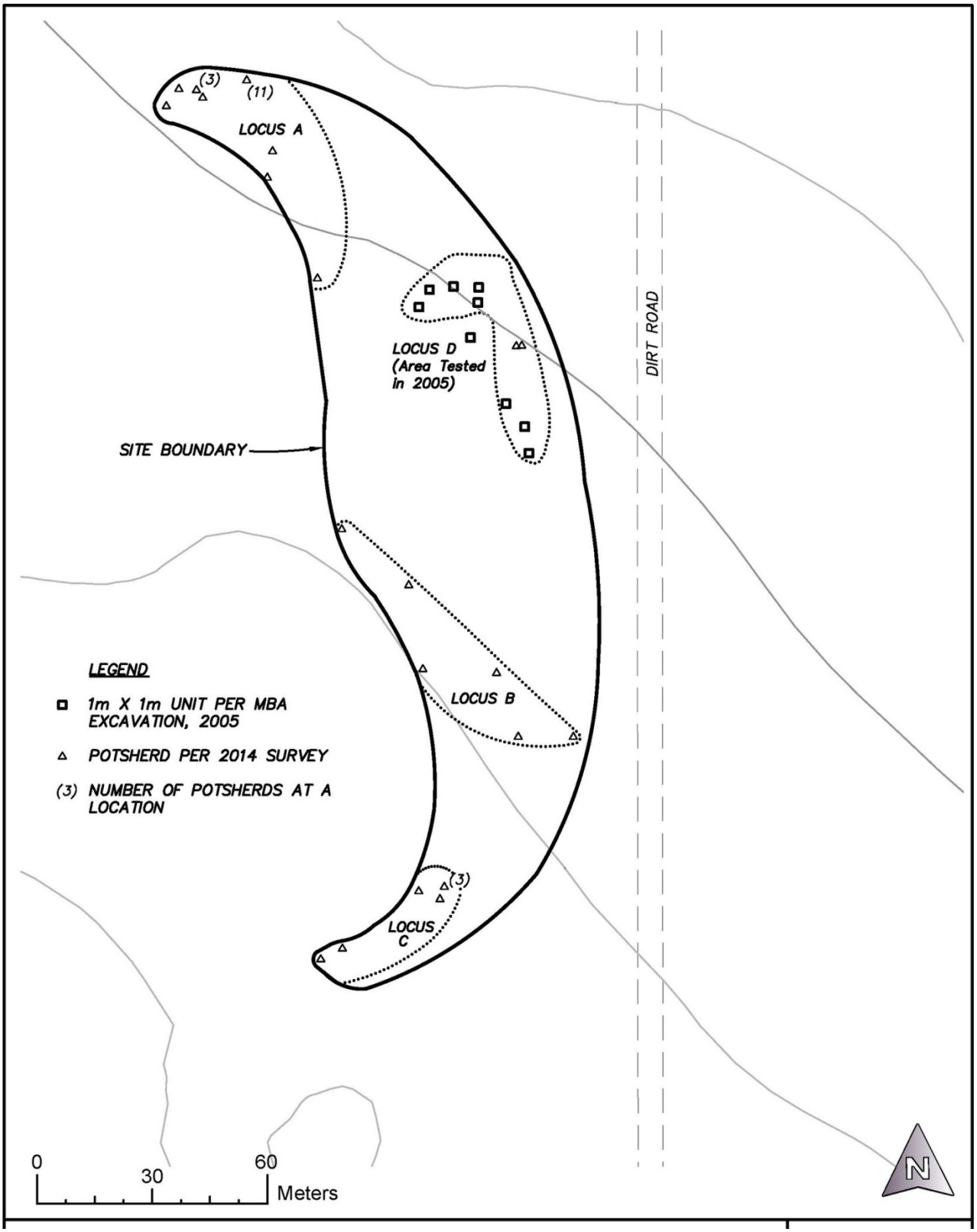


Figure 12: Site Map of RIV-7834 based on 2014 Resurvey (de Barros 2014)

Locus B measures 84 x 20 m; it is a highly dispersed scatter of six sherds.

Locus C measures 45 x 13 m; it is a scatter of seven sherds in two clusters: one of five sherds (including a tight group of three sherds) to the northeast and a second group of two sherds to the southwest.

Locus D as recorded in 2005 measured 55 x 40 cm. It was originally mapped showing 15 surface sherds in two loci to the northwest and south. A total of 13 surface sherds were collected, including four during testing; testing also recovered seven subsurface sherds, mostly from Units 1 and 4, both in the northwest cluster of the locus, for a total of 20 collected sherds. All test units were excavated to at least 40 cm in 20 cm levels. All artifacts (sherds) were recovered in the 0-20 cm level (see Dice and Messick 2005:23). The test excavations revealed agricultural disturbance to a depth of 20-30 cm. Test Unit 9 was excavated to 120 cm to help understand the broader stratigraphic context of the site. In the 80-100 cm level, shell lenses were noted and a charcoal sample was collected (Dice and Messick 2005:23-24 and Appendix C Unit Level Records), but no sherds or other artifacts were noted at this depth.

Using Waters' (1982) Lowland Patayan Ceramic Chronology, Dice and Messick (2005:23-24) identified the 20 sherds as mostly Salton Buff (9) and Salton Brown (8) with one sherd of Colorado Beige and two unidentified as to type.

3.2.2 Site Interpretation Prior to Phase II Testing in 2014-15

Given the paucity of sherds recovered (20), RIV-7834 was interpreted as a ceramic scatter, perhaps due to pot drops, and no intact buried features were encountered (Dice and Messick 2005:24). Given that multiple pottery types were identified in the report, the sherds from Locus D would have to represent multiple pot drops, perhaps produced as the result of multiple site visits over a period of years to procure plant resources.

3.2.3 Significance Evaluation by Dice & Messick (2005) and Proposed Additional Testing

After ruling out significance under Criteria A-C, the authors determined that RIV-7834 is not a significant resource under Criterion D of Section 106 of the National Historic Preservation Act (NHPA) or under Criterion D of CEQA (Dice and Messick 2005:24-27). However, only Locus D was recorded and evaluated. Additional testing was therefore recommended for newly recorded Loci A-C (de Barros 2014). Below is the research design for these test excavations.

3.3. RESEARCH DESIGN FOR RIV-7834 (Loci A-C) TEST EXCAVATIONS

The following was proposed in Section 5.3 of the Phase I report (see de Barros 2014:87-95). It has been slightly modified to better accord with what was actually

recovered, i.e., some research domains were no longer relevant because of the absence of the appropriate artifact category at the site.

The test excavations had three primary goals. The first was to assess whether RIV-7834 is an important historical resource based on its research potential to yield information about prehistory or history, i.e., eligibility under Criterion D for listing on the California Register of Historical Resources (see Section 5.1). This is generally based on kinds and quantities of artifacts and features present and their potential for addressing important regional research issues. The second was to determine the site's horizontal and vertical (depth) boundaries. And, finally the third was to assess the site's depositional integrity, i.e. are the site deposits sufficiently intact for study or have they been seriously disturbed?

3.3.1 Research Issues and Questions

This section discusses important regional research issues and questions that are relevant to RIV-7834; it also discusses the data required to address them. A major purpose of the test excavations is to determine whether such data are indeed present. One of the key variables in the subsistence-settlement patterns in the Coachella Valley was the cyclical infilling and desiccation of prehistoric Lake Cahuilla during the Late Prehistoric.

Prehistoric Lake Cahuilla Chronologies

RIV-7834 is situated at an elevation ranging from -45 to -30 feet below sea level. This means it was occupied during a time when prehistoric Lake Cahuilla was drying up or completely desiccated. The study of Lake Cahuilla chronologies is divided into two parts below. The first focuses on the work by Waters and modifications derived from work by Schaefer and Laylander. The second part focuses on a major earthquake study that resulted in abundant information about these lake chronologies leading to some significant modifications.

Waters (1980, 1983, 1997), Schaefer (1994a) and Laylander (2006)

Current data on Lake Cahuilla lake levels during the Late Prehistoric indicate at least three cycles of infilling, lake level equilibrium, and then gradual desiccation since A.D. 1200 (see Laylander 2006:Figure 6.1). Laylander (2006:60) estimates it took about 20 years for the infilling process to reach the high water mark of 12 m above sea level and roughly three times that long for desiccation to result in a dry lakebed at -85 m below sea level, assuming no recharge from the Colorado River during the desiccation process (see also Waters 1980, 1983; D. Weide 1976; Wilke 1978). The data currently suggest one lacustrine cycle every 200 years, but this periodicity may simply reflect the level of resolution of existing radiocarbon dates (Laylander 2006:59).

This cyclical lake infilling pattern suggests the following with regard to Indian adaptation patterns:

> These [cyclical] periods are too long in duration to have been bridged by . . .emergency measures to manage subsistence . . . such as using stored foods or making temporary visits to relatives outside the affected region. [And] the events were too abrupt and short-lived to have been managed simply by the unconscious process of gradual cultural adaptation. . . [i.e.,] the people who lived through the various episodes of a rising and falling lake were undoubtedly conscious of the changes . . .
>
> . . . .Most of the lake's rise may have been too rapid for shoreline biological communities, in particular marsh plants, to keep pace with its movements. . . . Once the lake was full, the shoreline may have stabilized for an indefinite period. A degree of stability is suggested by the tufa deposits that formed on rocks just below the lake's high water mark, by the well-developed beach features in some areas, and by the numerous archaeological sites that are associated with the maximum shoreline. How long the lake remained at this level during each of its infillings is unknown, although a full lake was obviously present for much briefer periods than the 500-year stand that was once suggested. . . . In any case, it seems likely that the longer the stable maximum shoreline existed, the richer its associated fauna and flora would have become.
> . . . . Although complete desiccation could have been accomplished in about 60 years, archaeological evidence from fish remains attests that the receding lake was refreshed by an inflow of water from the Colorado River on at least one occasion (Schaefer 1986). The example of numerous small natural floods of Colorado River water reaching the basin during the nineteenth century suggests that such episodes might also have been common prehistorically (Wilke 1978). Archaeological faunal remains of vegetation-adapted water birds at recessional shoreline sites indicate the floral community was able to track the receding shoreline, which was therefore likely richer in resources than the rising shoreline had been (Laylander 1997:85-90). On the negative side, recession was accompanied by gradually increasing salinity levels, successively impoverishing and then eliminating the various freshwater fauna and flora. However, there is evidence that fish and birds continued to be exploitable at least as low as -55 m below sea level, or a minimum of about 40 years into the desiccation phase.
> (Laylander 2006:60-61)

So far only surface to shallow artifacts deposits (upper 20 cm) are known at RIV-7834 based on the test excavations at Locus D and the recording of the surface ceramic scatters at Loci A-C. Previous periods of infilling of prehistoric Lake Cahuilla, which have occurred at least four times since A.D. 700 and 1580

(Waters 1997:227), with a likely fifth infilling invent in the 1600s (Schaefer 1994a:72; see also Laylander 2006). Waters (1997:227) notes that

> Buried sites are encountered below the shoreline where people camped on the dry lakebed whenever the lake level fell or the lake dried up. In many cases these sites became buried by alluvium shedding off the hillslopes and later by laminated lake basin sediments during a subsequent rise in the lake level. These sites were protected and preserved from the shoreface erosion associated with a later transgression of the lake because the overlying alluvium was thick and the lake rose rapidly.
> (Waters 1997:227)

Thus, sites consisting of only surficial or shallow artifact deposit would likely date to after the last major lake infilling ending in 1580. In fact, most surface sites have been dated to the period between A.D. 1430 and A.D. 1580 (Schaefer 1994a:67), though one could not rule out it dating to after the 17th century infilling (and subsequent desiccation) which may or may not have filled the basin (Schaefer 1994a:72). If there are important buried deposits, however, they would likely date to before one of the previous lake infillings. RIV-7834 is located at an elevation situation between -45 and -30 feet below sea level, well above the level at which the receding lake would become far too saline to support much wildlife. It is thus likely that freshwater fauna and flora associated with prehistoric Lake Cahuilla were still plentiful enough to exploit during its potential occupation. Laylander (2006) continues:

> After the disappearance of the lake, climax biotic communities slowly reestablished themselves on the dry lake bed. It has been suggested that there was a separate stage in human adaptations to the basin after the lake was gone but before mature mesquite groves established themselves (Wilke 1978:13-14; cf. Schaefer et al. 1987:22). Contrary to this is the fact that the exposure of the lake bed was a gradual process lasting decades, and desert plant communities must have established themselves at successively however elevations above the retreating shoreline, even while the lake resources were still available.
> (Laylander 2006:62)

Laylander (2006:62-71) goes on to discuss the potential effects of rising and falling lake levels on food resources, the spread of technology, the distribution of languages in the region, demography, subsistence strategies, trade, settlement and social organization, warfare, and political organization. In short, most basic research domains and associated research questions about the Cahuilla north of prehistoric Lake Cahuilla are inevitably linked to the cyclical rise and fall of the lake.

Philibosian, Fumal and Weldon (2011)

This study is entitled, “San Andreas Fault Earthquake Chronology and Lake Cahuilla History at Coachella, California” and was published in the *Bulletin of the Seismological Society of America* in 2011. It is based on fieldwork and later analytical studies beginning in 2006 (Philibosian et al. 2011:15-18). The authors determined that there have been at least five and up to seven major earthquakes during the past 1100 years with the most recent earthquake in ca. A.D. 1690, more than 300 years ago. Three 7-m deep, terraced trenches were studied north of Interstate 10 and south of Avenue 44, only a short distance from the project area situated just south of Interstate 10 and including portions of Avenues 47 and 48 between Tyler and Polk streets (see Figure 2). The study also provided valuable chronological information on the timing of the past 5-6 highstands (12 m or 40 ft. elevation shorelines) of ancient Lake Cahuilla since A.D. 800 (Philibosian et al. 2011:13, 33-35). Because of the exposure of the lake highstands and periods of desiccation in the stratigraphy of the trenches and the use of a large number of calibrated radiocarbon dates screened for possible inconsistencies (especially as it relates to dates obtained from freshwater bivalves), a great deal more clarity is now provided regarding Lake Cahuilla highstands and their duration. Their results are quite different from Water’s (1983) lake chronologies and are consistent with other earthquake studies (see Rockwell and Sieh 1994; see also Gurrola and Rockwell 1996; Thomas and Rockwell 1996; and Meltzner et al. 2006, as cited in Philibosian et al. 2011:35, all of which are generally consistent with Rockwell and Sieh 1994).

The chronologies of Water’s (1983), Rockwell and Sieh (1994) and the Philibosian et al. (2011) are illustrated together for comparison in Figures 13) which is a reproduction of Figure 18 in Philibosian et al. (2001:34). Their results indicate the six infillings (highstands) are grouped into two “mostly wet” periods.” The first wet period includes highstand periods 4L, 5L, and 6L, dated between roughly 850 and 1165 A.D. and the second wet period, which includes highstand periods 1L, 2L and 3L, between about 1385 and 1685 (see Figures 13&14). While Water’s (1983) shows no lake in the 1600’s, there is consensus after a careful analysis of the historic records of travelers’ observations during this period that there was indeed a lake in the 17th century (see especially Lippincott 2007; see also Laylander 2006 and Schaefer 1994a; see Philibosian et al. 2011:34-35). While occasional flooding occurred in the 18th and 19th centuries, none of these events produced a lake highstand during those periods. In addition, the interval between the highstands during the second highstand appears to have been short enough and/or was accompanied by partial infilling events that complete desiccation of the lake did not occur between the most recent three highstands (Brothers 2009, as cited in Philibosian (2011:34). These results are important for interpreting RIV-7834 and its relationship to infilling and desiccation of Lake Cahuilla during its occupation.

Some of the reasons Water's (1983, 1992) chronology differs substantially from the Coachella chronology include the following: 1) Water's (1983) perhaps did not have a large enough and representative enough database of well-dated sites to establish the chronology in more detail; 2) his chronology is based on relatively few radiocarbon dates, most of which were freshwater shells subject to the old-carbon reservoir effect (Philibosian et al. 2011:34). In fact, Philibosian et al.'s data show that when charcoal and/or organic sediments and freshwater shells are dated from the same location, the shell dates are between 400 to 800 years older than the non-shell dates (Philibosian et al. 20011:27).

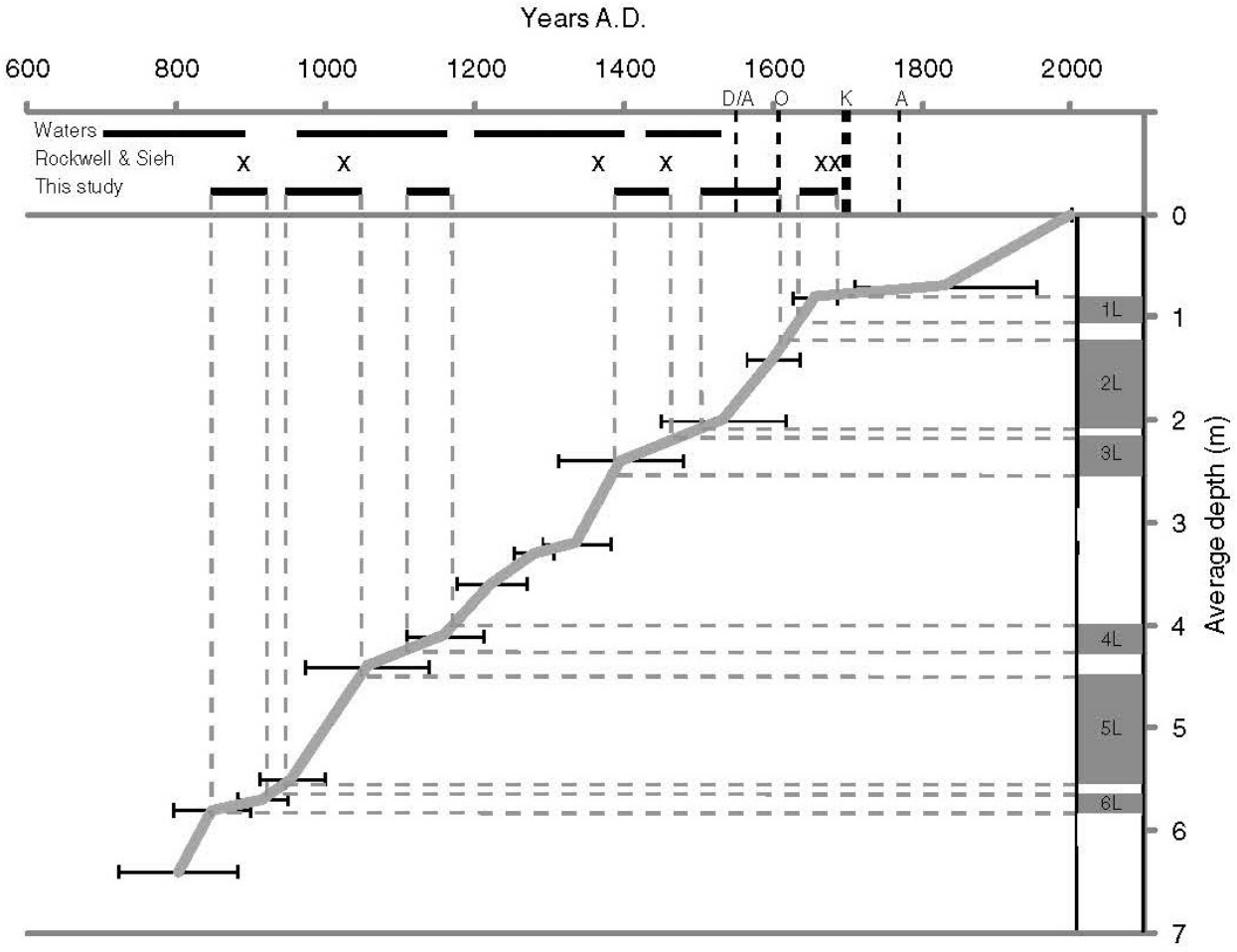


Figure 13: Comparison of Philibosian et al.'s (2011) lake highstand chronology based on trenches in Coachella with those of Waters (1983) and Rockwell and Sieh (1994). The Coachella-based study shows six distinct highstands grouped into two "mostly wet periods." The subdivision intervals between the mostly wet periods were probably insufficient for the lake to have completely desiccated, but may have shrunk to the size of the Salton Sea (Philibosian et al. 2011:34 & Figure 18).

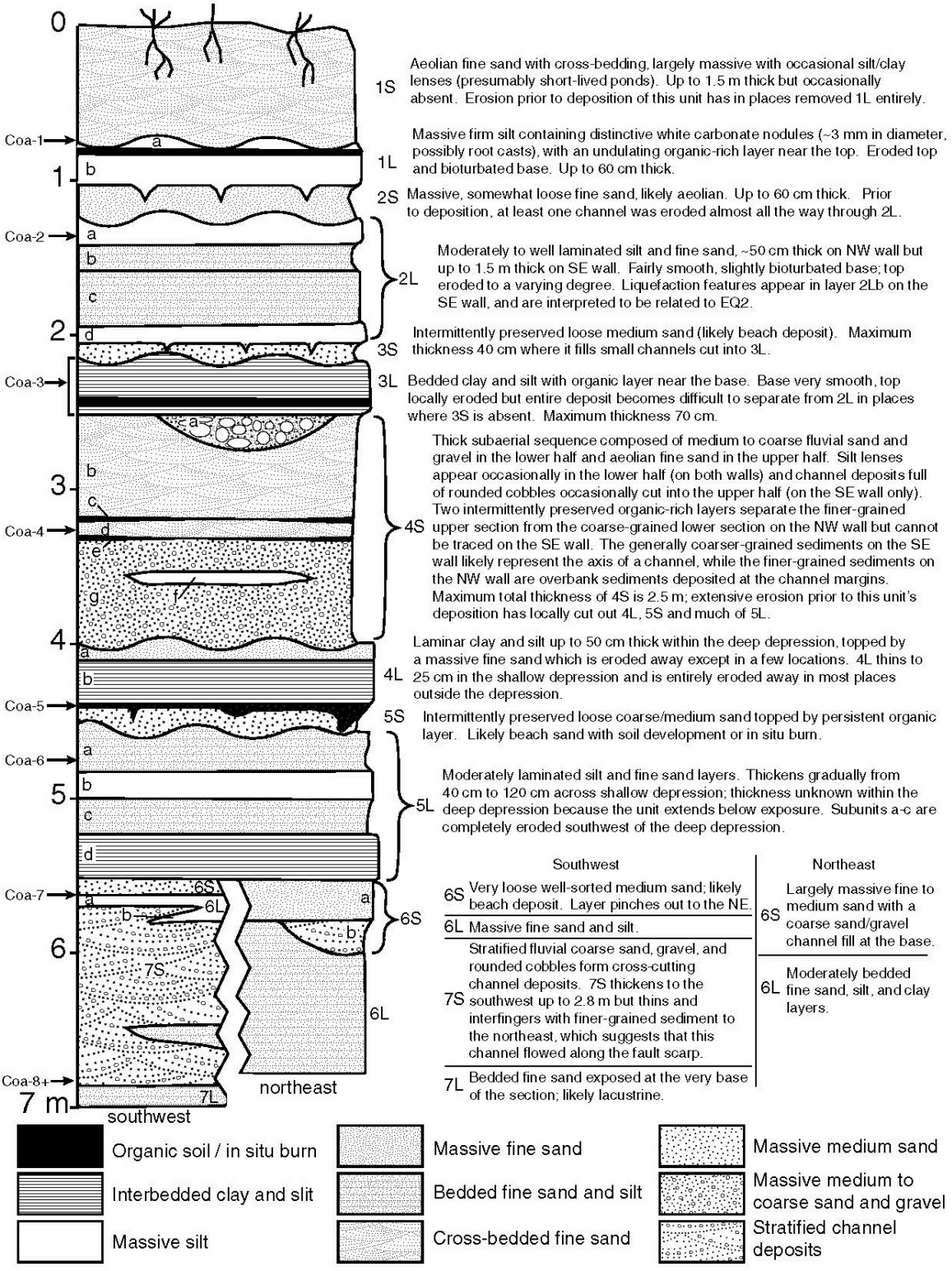


Figure 14: Generalized Stratigraphic Profile of Central Trench in Coachella. Wavy lines represent erosional contacts. L & S = lacustrine and non-lacustrine deposition (Philibosian et al. 2011:Figure 5).

Next, let's take a look at the issue of chronology, an issue so important to the archaeological study of any site or region.

Chronology or Site Occupation Period(s)

Question 1: During what time period(s) was RIV-7834 occupied?

In order to examine the effects of the cycle of infilling, stability, and desiccation of prehistoric Lake Cahuilla on settlement and subsistence, trade, and the like, it is critical to be able to date individual site occupations. Moreover, while data from a single site are important, the accumulation of data sets from a large number of sites will ultimately be required in order to address how the Cahuilla, and other ethnic groups who lived in the Coachella Valley (or Salton trough), adapted to their unusual environment over time. Thus, this site is one piece in a much larger mosaic of settlement.

Data Needs and Methods

Of critical importance here are data that will help us determine which period of desiccation and/or dry lake bed of prehistoric Lake Cahuilla RIV-7834 may be associated with – the period dating to ca. A.D. 1350 to 1425? ca. A.D.1450 to 1510? or ca. A.D.1620 to 1680? or perhaps a period preceding A.D.1300? (per Laylander 2006:Figure 6.1). Or perhaps more appropriately, how does the occupation of RIV-7834 match up with the two "wet Periods" and six distinct lake highstands found by Philibosian et al. (2011)?

Given the presence of Salton Brown and Lower Colorado Buffware (Dice and Messick 2005:23), it is perhaps not likely that we dealing with an occupation that pre-dates 1200 A.D. The most useful data for assessing site occupation are going to be radiocarbon dates based on charcoal found in intact cultural contexts. If RIV-7834 has been too badly disturbed by agricultural practices, it may not be possible to find such intact deposits. Here the issue of depositional integrity and significance are clearly linked, at least in part. Temporally sensitive artifacts, such as pottery or projectile point types, are not likely to have sufficient chronological precision to help us answer this question. However, obsidian hydration data and the presence of temporally diagnostic shell beads or ornaments may be helpful. Charcoal would be sent for dating to Beta Analytic, Inc. Obsidian flakes and artifacts, if recovered, would be sent to Richard Hughes for sourcing and Tom Origer for obsidian hydration analysis. However, no obsidian artifacts or shell beads were recovered from the test excavations.

Settlement and Subsistence

Since virtually no food remains were recovered from the test excavations at RIV-7834, the text below focuses only on settlement patterns and not subsistence.

Given the elevation of RIV-7834 at ca. -45 to - 30 ft. below sea level, it was occupied during a period of desiccation or fully dry lake bed. Of particular importance are data that might help us choose between the two competing models proposed by Weide (1976) and Wilke (1978) regarding settlement and adaptation to the lake. David Weide (1976) assumes that the instability of the lake meant that lacustrine resources were relatively unreliable and only sporadically available which led to only a seasonal reliance on lake resources that served as a secondary element in the diet (Schaefer 1994a; M. Weide 1976). The Wilke model emphasizes extensive use of lake resources with nearly year-round settlement on the lake shore. The desiccation of the lake would thus represent a major loss in food resources resulting in major regional consequences (Wilke 1978; see also Laylander 2006:62). Conversely, one could argue that periods of lake infilling and lake level equilibrium would have resulted in a major increase in a variety of food resources, such as fish, water birds, and relatively abundant shoreline plants and animals, clearly offsetting losses in mesquite and other desert resources (Laylander 2006:63). One should also consider that lake desiccation could have occurred in stages with occasional more stable lake level periods resulting from partial infilling episodes.

Question 2: Was RIV-7834 a seasonal settlement or relatively permanent lakeshore site?

Data Needs and Methods

A seasonal campsite would tend to have relatively low densities of fire-altered rock and/or hearths and would possibly lack any kind of substantial midden development, whereas a more permanent site would have relatively high densities of fire-altered rock and perhaps intact hearth features along with a relatively darker midden soil. A permanent settlement is also more likely to have evidence of house floors and artifacts associated with non-utilitarian tasks, such as shell beads and ornaments and the like.

Origin of Ceramics in the Coachella Valley

Rogers (1939, 1945) hypothesized that Lake Cahuilla was present continuously between A.D. 1000 and A.D. 1500, and that ceramic technology passed westward after lake desiccation. We now know that there were multiple infillings and periods of desiccation during that time and the current view is that ceramics developed earlier than Rogers suggested and that it was probably an indigenous development (Griset 1996; Waters 1982). However, Love and Dahdul's (2002:79-83) review of sites indicates that no radiocarbon dates have been obtained prior to ca. 1000 A.D. with associated ceramics in the Coachella Valley.

Laylander agrees the local ceramic technology was probably an indigenous development, but that it was not adopted in the region until there was an economic incentive to do so, e.g., increased sedentism that would have made

ceramic vessels more attractive containers for certain products than baskets (Laylander 2006:64). In any case, an important research question relates to when local pottery production began in the Coachella Valley. If RIV-7834 produces radiocarbon dates indicating a pre-1000 A.D. occupation, this would be helpful in answering this question.

Waters (1982) Lowland Patayan Ceramic Chronology

Waters (1982) proposed a Lowland Patayan ceramic chronology that began with Patayan I (750-1050 AD), followed by Patayan II (1050-1500 AD) and Patayan III (post-1500 AD). He also suggested that direct ceramic vessel rims were a feature of Patayan I and therefore indicated occupation prior to ca. 1050 A.D. However, more recent work by Hildebrand (2003) for the North Baja Pipeline Project, using radiocarbon dated stratified deposits, has demonstrated that direct rims are found in later periods. For example, Colorado Beige ceramics were found to cover the period from A.D. 870 to 1645 with a mean date of A.D. 1348 and, most importantly, the dated Colorado Beige rim sherds were direct, rather than recurved (Hildebrand 2003:258). He obtained similar results for Black Mesa Buff which was thought to be a Patayan I ceramic type for which he obtained dates from A.D. 1345 to 1645 with a mean date of A.D. 1517. The dated rim sherds were also direct for this Patayan II/III period (*ibid.*).

Dice and Messick (2005) identified most of the ceramics at RIV-7834 and nearby RIV-7835 and -7836 as Salton Brown or Salton Buff with an occasional Colorado Beige sherd, classifications based on Waters' (1982) typology (see also Hildebrand 2003:246-247). Do the other loci at RIV-7834 have types that match their identifications for Locus D?

Question 3: What ceramic types are present at RIV-7834 when Loci A-D are examined? Is there evidence that Tizon Brownware is present instead of Salton Brown (see Schaefer 1994a)?

Question 4: Is the probable Salton Brownware at the site made locally or was it imported from the neighboring mountains?

Data Needs and Methods

Radiocarbon dates and obsidian hydration data will be the most helpful for determining site occupation periods. While this issue is also discussed under trade, determining which ceramics were produced locally and which were imported needs to be assessed here. Lower Colorado Buffware is known to come from the east, but what about the probable Salton Brownware. Salton Brown is most commonly associated with the western shore of Lake Cahuilla (Hildebrand et al. 2002; Schaefer et al. 2013:114), so where is it coming from on the eastern shore? While trace element studies of local clays and sherds is perhaps the best way of assessing this, its costs are beyond the scope of this

study. However, a very useful method for assigning ceramic types is through the creation of petrographic thin sections from sherds. The ratios of various types of minerals in the paste can help determine whether they were made locally or were imported from elsewhere, say from the mountains to the west (see de Barros 2005b; Guerrero 2005). The presence of possible Colorado Buff ware will also be examined.

In the original research design it was proposed that a small selection of surface and subsurface ceramics would be sent to John Hildebrand for the preparation of thin sections for analysis, which can also help confirm the presence of specific types of Lower Colorado Buffware at RIV-7834 as well as whether Tizon Brownware is present. In fact, thin sections were made by Alkaly Ram, former thin-section specialist at the University of California at Los Angeles' Geology Department and were analyzed by Jerry Schaefer of ASM and Associates. In fact, however, no Tizon Brown ware or Patayan III Colorado Buff ware (Waters 1982:569-570) were identified at RIV-7834.

Lithic Procurement and Reduction Strategies and Trade

This topic is not discussed here as suggested in de Barros (2014) because no lithics, including obsidian and wonderstone or shell beads were recovered from the RIV-7834 test excavations.

Ethnographic and Connections to the Project Area

Interested tribes will be asked to consult with their elders to determine whether anyone has any knowledge of the previous inhabitants RIV-7834, especially if turns out to be post 17th century. This was pursued regarding traditional Cahuilla pottery making but it has been too long since traditional methods were used to obtain such knowledge; for example, what fuel was typically used to fire ceramics. Data are available for the Kamia, Kumeyaay and other groups, but not for the Cahuilla.

3.3.2 Field Methods

The methods discussed below are generally derived from de Barros (2014) but have been modified to fit the actual methods used during Phase II test excavations. It is thus written in the past tense.

Excavation Sample, Site Boundaries and Site Depositional Integrity

A combination of field procedures were used to: 1) obtain an adequate sample of artifacts, ecofacts and features to permit the assessment of site significance; 2) assess site depositional integrity, and, 3) determine the horizontal and vertical boundaries of Loci A-C at RIV-7834. These strategies are summarized below.

Mapping and Collection of Surface Artifacts

The mapped Phase I surface collection provided a tentative set of horizontal boundaries. These sherds were mapped using a pair of electronically-linked Magellan Promark 3 GPS dataloggers, one acting as a base station and the second as a rover. The collected data was later differentially corrected with accuracies generally at ± 5 cm. Additional surface artifacts encountered noted during the test excavations were mapped and added to the overall site map. A sample of surface sherds from Loci A-C was collected for analysis.

Placement of Hand Excavated 1 x 1m Units within Loci A-C

It was initially felt that three to four 1 x 1 m test units would be sufficient for Loci B and C and that six to eight units would be enough for Locus A. However, unit excavation into the generally friable lake sediments proceeded very rapidly and the material was very easy to screen. As a result, the sample size was expanded to 10 units in Locus A, seven in Locus B, and initially eight in Locus C. During the last day of excavation a hearth feature was unexpectedly encountered in Unit 24 which led to additional phases of fieldwork. Given the paucity of surface material, most test units were placed where a surface sherd(s) were present. Some additional units were placed in open areas between sherds as well, but these almost invariably produced no artifacts.

From December 29-31, a 3 x 3 m block excavation was conducted centered on Unit 24 (Units 24A-H) which led to the discovery of two major hearths and an enigmatic light-orange colored oxidized layer with charcoal spots. All of these features were situated within a matrix of unconsolidated stream or beach sandy gravel. In addition, rain that fell a week earlier, exposed additional surface sherds which led to the excavation of four additional units, one of which encountered a third hearth to the west of the others. Finally, on March 7th, in an attempt was made to determine if the hearth features and oxidized layer extended further north, two 1 x 3 m units (Units 29 and 30) were excavated north of the Unit 24 complex. These units demonstrated the oxidized later continued to the north for 5-6 meters but only two sherds and a single fire-altered rock were found in each unit. No more hearths were found.

All units were oriented to magnetic north and excavated in 20-cm levels to a minimum depth of 40 cm. If cultural deposits extended into the 20-40 cm level, excavation continued at least one additional 20-cm level beyond the previous level with cultural deposits. It was originally intended to take column soil samples from units containing evidence of charred (and uncharred) macrobotanical remains for later flotation. However, none were taken because no such deposits were encountered. Finally, it was decided to excavate at least one test unit at each locus to a depth of 80-100 cm or more to obtain a stratigraphic reference profile to help provide a better understanding of local geomorphological conditions. This was done in Locus A (Unit 1) and in Locus C (Unit 11), but did

not take place in Locus B as virtually no subsurface deposits were encountered and the ceramic surface scatter was very light.

The hearth features in the Unit 24 complex were excavated as features and were excavated with a trowel, slowly scraping down to expose FAR and charcoal deposits. Each charcoal deposit was collected and placed in film canisters. Much of the charcoal in both hearth features was in powder form or charcoal-stained soil which was not collected. A large number of samples were taken from both hearths and their vicinity with samples selected for analysis. All charcoal deposits and FAR locations were carefully mapped within each 1 x 1 m portion of the block excavation and depths were taken using a line level attached to the block excavation datum in the northeast corner. Measurements taken of the surface depth of the area in relation to the datum allowed for the depths to be adjusted to correspond with those taken from Unit 24 in the center whose depths were determined using surface contour levels (see below). 10-cm baulks were initially left between 24A-D in order to draw profiles of the Heart #1 area. The baulks were later removed for and additional ceramics or FAR.

All excavated material was dry screened through 1/8" mesh. Wet screening was not necessary as, except for a few thin (1-2 cm) consolidated silty clay layers, soils consisted of silt, sand and gravel that was easily screened.

Excavation Documentation

Unit notes were taken in a unit bundle containing double-sided pages for each level with room for a level plan view and sheets for drawing soil profiles and writing up a summary of unit characteristics. Because of the relatively flat terrain, unit depths were excavated using surface contours as a reference instead of using a line level attached to a unit datum. Unit depths were measured by laying a wooden bar across the top of the 1 x 1 m unit iron frame and measuring down from the bottom of the frame.

As noted above, a line level was used to excavate the Unit 24A-H complex around Unit 24 as the 3 x 3 m unit was too large to use surface contours as a reference. The surface contours of the 3 x 3 m unit were established by taking numerous depth measurements from the NE corner datum to establish differences in depths from the unit datum 0-cm depth; the Unit 24 complex slopes downwards to the south.

In addition, photographs were taken of the general landscape, hearth features, soil profiles, and many sherds to help document the excavation.

GPS Mapping

As noted above, all additional surface sherds were mapped using GPS. Excavation units were also mapped by taking GPS readings at their NE and SW

corners with all units oriented along a north-south axis. Mapping was done using a pair of electronically-linked Magellan Promark 3 GPS dataloggers, with one acting as a base station and the second as a rover. The collected data was later differentially corrected with accuracies generally at ± 5 cm. The maps produced from the GPS data were all created by cartographer and GIS/GPS specialist and archaeologist (Egyptologist), Joel Paulson.

Proposed Backhoe Trench

It was originally planned to excavate a long trench traversing Locus A up to the 5-7 m high sand dune to the north and northeast to check for buried deposits. However, the discovery of the hearth features in Locus C resulted in a great deal of time and money being spent in the excavation and analysis of the resulting materials and it was decided not to conduct this study. Indeed, if deposits are sparse and thin, it is often very difficult to see such layers in the trench strata. If they are significant, many should be detectable through grading monitoring and this was the option chosen.

3.3.3 Analytical Methods

The test excavations at RIV-7834 produced the following features and artifact types: three hearth features and an enigmatic oxidized layer with charcoal spots; over 110 ceramic sherds, some from the same vessel; abundant charcoal from the hearth features; abundant fire-altered rock; two pieces of bone, a fish vertebra that may not be cultural and one very small piece of burnt bone associated with a charcoal spot in the oxidized layer; and a large historic period washer (probably from a vehicle). In addition, numerous soil samples were taken from soil profiles to aid in establish stratigraphic profiles and associated Munsell color descriptions. No human remains were encountered and not a single stone artifact (flaked or ground) was recovered. No charred food remains were recovered either. In short, beyond charcoal, ceramics and fire-altered rocks, it was an assemblage with very limited diversity.

Artifact Processing and Cataloguing

All artifacts were bagged in paper bags in the field and then transferred to plastic bags in the lab, except for fire-altered rock which was stored in double-bagged grocery bags. Each bag was marked with the site and unit number, excavation level or artifact depth, the type of artifact, the date, and the initials of those excavating that unit.

Artifacts that required cleaning/washing were some of the surface ceramics, most of the subsurface ceramics, and some of the fire-altered rock. Surface ceramics were often washed clean by the rain. Fire-altered rock (FAR) was washed if exterior dirt made it hard to detect burned areas or impeded the identification of the rock type.

Fire-Altered Rock (FAR)

FAR was not common in the excavation deposits except in Hearths Nos. 1 and 2 in the Unit 24 complex and a few FAR in Unit 25, all in Locus C. No FAR was encountered in Loci A and B. One FAR each was also recovered in Units 29 and 30, again in Locus C north of the Unit 24 complex. FAR was washed when necessary, weighed, measured, and identified as to rock type by the author with important help from Sean Figg, Assistant Professor of Geology at Palomar College.

Charcoal

Charcoal was rare outside of the three hearth features encountered in Locus C. It was collected in film canisters labeled by provenience. All of the charcoal samples were assigned catalog numbers and samples from the hearth in Unit 25 and from Hearths 1 and 2 in the Unit 24 complex were sent for analysis by Allison Jaqua, M.A., graduate student and assistant for the Integrative Subsistence Laboratory at University of California at Santa Barbara. The analyzed charcoal from the Unit 24 complex came from the Hearth 1 area (Units 24, 24A, B, D) and from Hearth 2 (24G). Samples were also provided from charcoal spot areas found within the oxidized layer from 32-40 cm in Unit 29 and from 32-45 cm in Unit 30. The goal here was to identify the types of fuel used and if they varied from hearth to hearth and between the hearths and the oxidized areas with charcoal spots. The charcoal was also checked for charred seeds or other food remains, but none were recovered. Ms. Jaqua wrote a report that discussed the types of wood found and their traditional indigenous uses (see Appendix C).

Ceramics

Over 110 surface and subsurface ceramics were recovered during the test excavations from Loci A-C. They were washed as necessary and then subjected to a detailed descriptive analysis using the naked eye and a 40X binocular microscope. The following attributes were recorded: catalog number, provenience (unit number and level), vessel wall thickness; sherd length and width dimensions; surface color (interior and exterior) and other unusual surface attributes, such as stuccoing (Van Camp 1979:50), protruding surface grains, fire clouds, a whitish scum (from extruding salt; see Van Camp 1979:48-50), surface voids, scrape or wipe marks, and bloom (see Van Camp 1979:50); surface treatment (degree of smoothing or burnishing; undulating surface); core color and type (full core, sandwich core, side core); temper (none, sherd, crushed rock, sand, fiber); paste minerals; rim/lip types; hardness/fracture (based on ease or difficulty of removing a chip to examine a fresh surface); attributes of form (jar vs. bowl; interior bowl or jar diameter; firing atmosphere (reduced or partially reduced; oxidized); neck vs. body vs. base sherd; and identified ceramic type, e.g., Salton Brown. This work was done by Dr. de Barros with some changes

made based on discussions and/or analysis by Dr. Jerry Schaefer of ASM and Associates of Carlsbad, California.

After a discussion session with Jerry Schaefer, 20 sherds were selected for thin-sectioning, which was done by Alkaly Ram, of R. A. Petrographics, a former technician who worked for the UCLA Geology Department. These 20 thin sections were studied intensively by Dr. Schaefer using both a binocular and petrographic microscope to help identify temper and mineral types within the paste, as well looking for voids, and so forth. The 20 sherds were then assigned to types identified by Waters (1982). Most were assigned to Salton Brown, Topoc Buff and Tumco Buff. Dr. Schaefer also produced a report discussing the findings with photographs of paste composition derived from sherd cutting profiles and thin section micrographs illustrating minerals seen through the petrographic microscope (see Appendix D2). All rim sherds, and a few base sherds, from bowls and jars were drawn by Dr. de Barros with final drawings made by cartographer, Joel Paulson.

Bone

Only two pieces of bone were recovered, a fish vertebra from the 0-20 cm level of Unit 3 in Locus A, and a small fragment of burned bone from a charcoal spot in the north wall (14-34 cm in depth) of Unit 24B. The fish vertebra may not be cultural and was not analyzed. The tiny burned bone bit was non-diagnostic and is very small. There is nothing to suggest it is human bone.

Historic Artifact

Only a single large metal washer was recovered, mostly likely from a motor vehicle from the 0-20 cm level of Unit 4 in Locus A. It was not analyzed further.

Radiocarbon Dating

Charcoal was submitted for radiocarbon dating from the following proveniences:

- Unit 24, north wall, 16-20 cm (1.3 g), Hearth #1;
- Unit 24A, 14-20 cm (0.83 g), north side wall from a charcoal spot within the oxidized layer;
- Unit 24G, 28 cm (0.67 g), Hearth #2; and,
- Unit 25, 28-30 cm (0.5 g), near hearth FAR.

The samples were sent to Beta Analytic, Inc., in Miami, Florida, a commercial lab that the author has used since 1981 with virtually always good results that correspond to other chronological indicators when available. In the end, only Hearth #1, the oxidized layer, and the hearth in Unit 25 were dated. Hearth #2 was not dated due to lack of funds. All dates were dated using AMS (linear accelerator) dating with controls for C12/C13 ratios. Both raw dates and calibrated dates were provided at both 1 and 2 sigma.

SECTION 4 – RESULTS

Results are presented by discussing the two sites for which additional archival research and/or testing was required (RIV-11776 and -7834), followed by sites where no additional work was required (RIV-7835, -7536, -11775 and –11817).

4.1 RIV-11776, HOUSE FOUNDATION AND RESERVOIR

This site consists of the remains of a probable farm residence that was built in the early 1950s after water was brought to the area via the Coachella Canal completed in 1949 (see Figures 15&16). Current remains consist of the house foundation and its adjacent cement porch and a foundation for a propane tank. Just east of the foundation is a shallow dry reservoir was apparently built after 1972 (see Figure 2). Two trash scatters are also present. A paintball arena made of plywood and other wooden structures occupies the area within and north and west of the foundation, including the remains of a probable snack store for paintball participants. These structures were not mapped or recorded as paintball arenas only developed in the 1980s and 1990s and those within the foundation area clearly post-date the fire that destroyed the residence in ca. 2011. The entire site measures 128 m (EW) by 85.5 m (NS). It is located along a dirt road south of Avenue 47.

Historic maps prior to the 1950s do not show any cultural features in Section 28 of T5S, R8E, SBBM, where the structure is located, including the 1941 and 1943 U.S. Army Corps of Engineers 15' *Coachella* quads. The Coachella Canal is also not shown, as it was completed in 1949 and underground irrigation networks were developed in the early 1950s. The reservoir just east of the house was built after 1972 as it does not show up on the 1956 (photorevised 1972) USGS 7.5' *Indio* quad. Land patent records available online at the Bureau of Land Management (BLM) web site, show that the SW¼ of Section 28, where the structure is located, was originally purchased with cash under the authority of the 1820 Land Act, on July 13, 1911, by George W. Ingram, but no structures appear to have been built on the property until after 1950.

4.1.1 Historic Foundation and Reservoir

A brief description of the historic foundations and reservoir are provided below (see the Phase I report by de Barros 2014) for more details. The historic foundations and reservoir are shown in Photos 5A&B below.

Historic Foundation

The foundation, exclusive of the cement porches on the east and north sides, is about 65' long (EW) and 45' wide (NS) (see Photo 15A. The foundation itself consists of a cement buttress on which the house sat; there does not appear to be a cement slab under the house, unless it is covered deeply in sand. The large

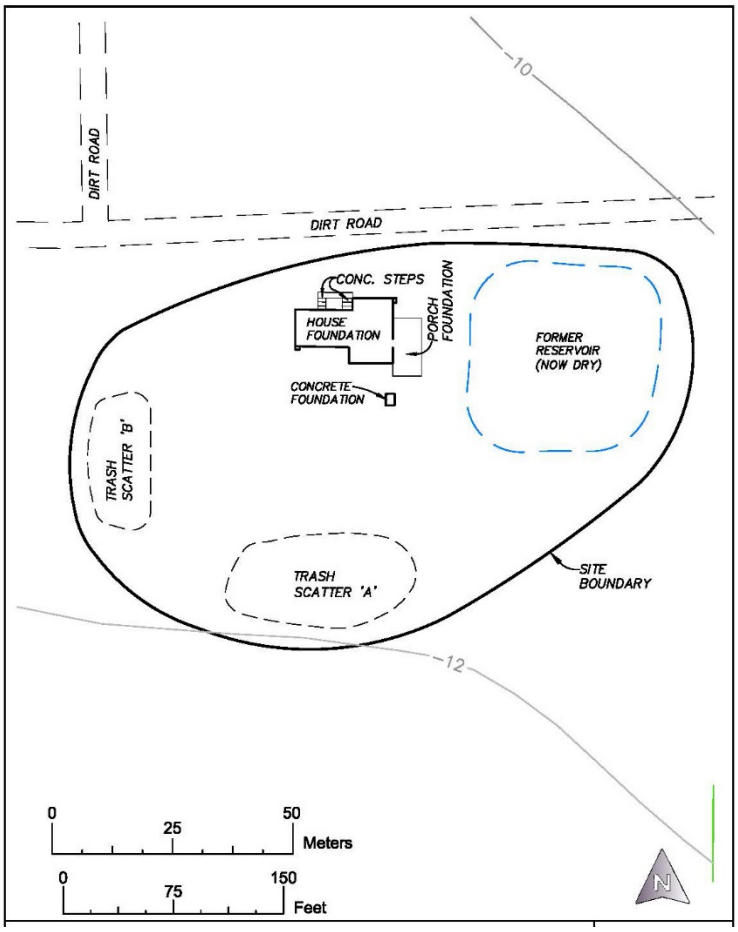


Figure 15: Site Map of RIV-11776

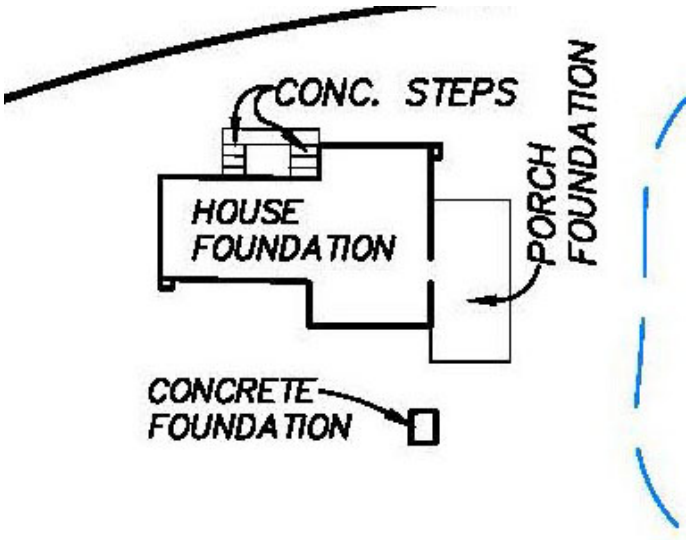


Figure 16: Close-up of House Foundations

Photo 5A: House Foundation with Stepped Entrances, Facing East.
Note plywood paintball arena structures within the foundation area.

Photo 5B: Dry Reservoir with Recent Trash Dumping and Burning, Facing NE

porch to the east measures 39'10" (NS) by 19'6" (EW) and extends further to the south than the structure itself. The northern porch measures 51' in length (EW) and 3'10" in width (NS) and allows one to enter by either set of concrete cement and block steps on the north side. These concrete sets of stairs are both 8'2" in length (NS) but the western stairs are 5'5" wide and the eastern stairs are 7'2" side, suggesting this was a main entrance. The stairways are 11'1" apart. The need to walk up the stairs to enter the house confirms the idea that house was set largely above the ground. There is little associated trash with the house foundation other than broken bottle glass here and there. The paintball operations were expanded inside the foundation after the house burned down in ca. 2011 which resulted in incidental trash dumping and disturbance to parts of the foundation.

A small cement slab measures 7'9" (NS) by 6' (EW) is present just southeast of the structure (see Figure 11 above). It shows evidence of something attached that was metal, probably a propane tank. It is located about 11 ft. directly south of the west edge of the cement porch on the east side of the house.

Reservoir

The consists of a roughly rectangular reservoir created by piling up earth and creating a shallow depression inside whose surface has been hardened by an asphalt-like material. It measures 110 x 110 ft. in its external dimensions (see Photo 15B). Its height is estimated at 6-8 feet and its depth perhaps the same. The reservoir slopes downward to a smaller area in the center, so its depth varies from the edges toward the center. There has been some recent dumping of a variety of construction materials and trash. There is also evidence of the remains of a crude structure made of loose concrete blocks, cloth, and wood which sheltered a homeless person (says our informant, Tony C.), but it has since collapsed. The reservoir is about 10 m east of the main house porch cement slab. This reservoir was built after 1972 as it does not appear on the 1956 (photorevised 1972) USGS 7.5' *Indio* quad.

4.1.2 Trash Scatters A and B

Trash Scatter A is about 35 m south of the house foundation and measures 38.5 m (EW) by 19.7 m (NS). According to our local informant, Tony Callebocazuca(?), it represents an area where burned wooden debris from the house fire was buried along with broken glass, ceramic, and metal artifacts from the burned house. This trash has recently been swept into small, low piles of various sizes that appear to contain artifacts of recent origin (last 10-15 years).

This relatively low density Trash Scatter B is located to the southwest of the house foundation at a distance of about 32 m. It consists mostly of a light scatter of broken glass, ceramic and metal items, with a couple of areas of somewhat higher density surface material. Informal trowel probes did not suggest that the trash scatter has much depth.

4.1.3 Archival Research at the Riverside County Archives

The historic foundation site and associated reservoir, recorded as RIV-11776, was located on Parcel's 5 and 7 of Map Book 603, Page 15 of today's records. The structure in question first appears on the 1952 USGS 7.5' *Indio* quad, but is absent on the 1941 and 1943 15' *Coachella* quads (see Section 2.2.2 above). The goal was to determine when this structure was built. On December 10, 2014, Dr. de Barros examined Riverside County assessor's records archived at the County Archives in Moreno Valley with the assistance of archivist, James Hofer. A careful study of Assessor's Map Book 25, p. 25 found that parcels 5 and 7 in modern records (Map Book 603, p. 15) corresponded to Map Book 25, page 25, parcels 000-012 and -018, respectively. In 1944, the two parcels, excluding some brief sales and repurchases, were owned by E. M. Pendleton (wife Lolita) and Wesley W. Hendricks (wife Margaret), respectively. This ownership pattern continued through 1950 with Hendricks taking control of both parcels in 1951. Hendricks later sold the property to Allen and Beatrice Siegel in April 1962, who then sold it to W. C. Douglas in 1965, who sold it to the Tri-W Development Corporation in November 1966. Tri-W Development controlled the property through 1976 but it is listed with Bank of America as of September 22, 1978. At no time do the records show any evidence of structural improvements on the property between 1944 and 1978.

4.1.4 Historic Aerial Photos

This is perplexing given the structure shown on the 1956 7.5' *Indio* quad. Historic aerials photos obtained from Historic Aerials (see www.historicaerials.com/mobile/index.php) do not show a structure in the location of RIV-11776 until 2002 and possibly as late as 2008. They do show the reservoir as early as 1977 and it is essentially in the location of where the house is shown on the 1956 *Indio* quad.

The 1977, 1996, 2002, and 2005 aerial photos (see Photos 6A&B) all show the reservoir which clearly contains water in 1996. There do appear to be some shed-like structures along the road in the 1977 aerial in a location north of the actual historic foundation. This is not so clear in the 1996 aerial. There does not appear to be a house and associated trees until possibly 2002 and only clearly by 2005. In short, this house may be less than 13 years old and perhaps only 9-10 years old; and thus it should not have been recorded as an historic structure.

Since there is no evidence in the assessor's records of improvements that could correspond to a house up through at least 1978, even if the structure was present in 1978, it would still be only 37 years old. Furthermore, a closer examination of the artifacts in Trash Areas A and B did not indicate any artifacts older than 10-15 years.

Photo 6A: 1977 (above) and 1996 Aerials showing Reservoir, RIV-11776

Photo 6B: 2002 (above) and 2005 Aerials with Reservoir and House

RIV-11776 also includes the reservoir. It was built after 1972 and is clearly present in historic aerial photos as early as 1977 (see Photo 6A). It is thus somewhere between 38 and 43 years old, just under the 4-year-old threshold for site recordation and evaluation.

But why was something shown at the location of RIV-11776 in 1956? Perhaps there was some temporary structure that does not show up in the assessor's records that was later destroyed when the reservoir was built in the same location after 1972.

In any event, as a result of the additional archival research, including a study of historic aerial photos, test excavations in the trash areas associated with the historic house foundation were not conducted since neither the historic foundation nor the reservoir are of sufficient age to merit evaluation as historic structures (see Section 5 below).

4.2 RIV-7834, CERAMIC SCATTER WITH HEARTH FEATURES

4.2.1 Introduction

The history of the test excavations, the research design, and field and analytical methods have been presented in some detail in Section 3.3 above and will not be repeated here. This section presents the results of the Phase II excavations with maps, photographs, and tables associated with the fieldwork and analytical studies. After presenting the revised site and loci maps, the contents and stratigraphy of Loci A, B and D will be summarized first. They were all largely or entirely composed of surface or near-surface ceramic scatters with no other artifacts. Then, an extensive discussion will follow regarding Locus C which had both surface and subsurface ceramics and at least three hearth features.

4.2.2 Revised Site Map Based on Phase II Testing, 2014-2015

A total of 30 units were excavated:

- Units 1-10 in Locus A, all 1 x 1 m units
- Units 17-23 in Locus B, all 1 x 1 m units
- Units 16-22 and 25-28 in Locus C, all 1 x 1 m units
- Unit 24 complex: a 3 x 3 m block excavation with containing hearth features initially encountered in Unit 24
- Units 29 and 30, 1 x 3 m units excavated north of the Unit 24 complex

The total excavation volume for RIV-7834, broken down by locus, including the nine test units done by (Dice and Messick 2005), is 24.95 m^3.

- Locus A: 5.25 m^3
- Locus B: 2.80 m^3
- Locus C: 12.10 m^3
- Locus D: 4.80 m^3

Additional surface sherds were recovered in Locus C and one in Locus B which altered their dimensions and resulted in a slight change in the shape and size of RIV-7834. Figures 17-20 show the revised site map, showing surface sherds and test excavation units, along with independent views of Loci A-C.

4.2.3 Vegetation, Artifacts and Stratigraphy for Loci A, B & D

Site vegetation consists of a mix of saltbush and creosote scrub, including on the dune just northeast of Locus A (see Photos 7&8 below).

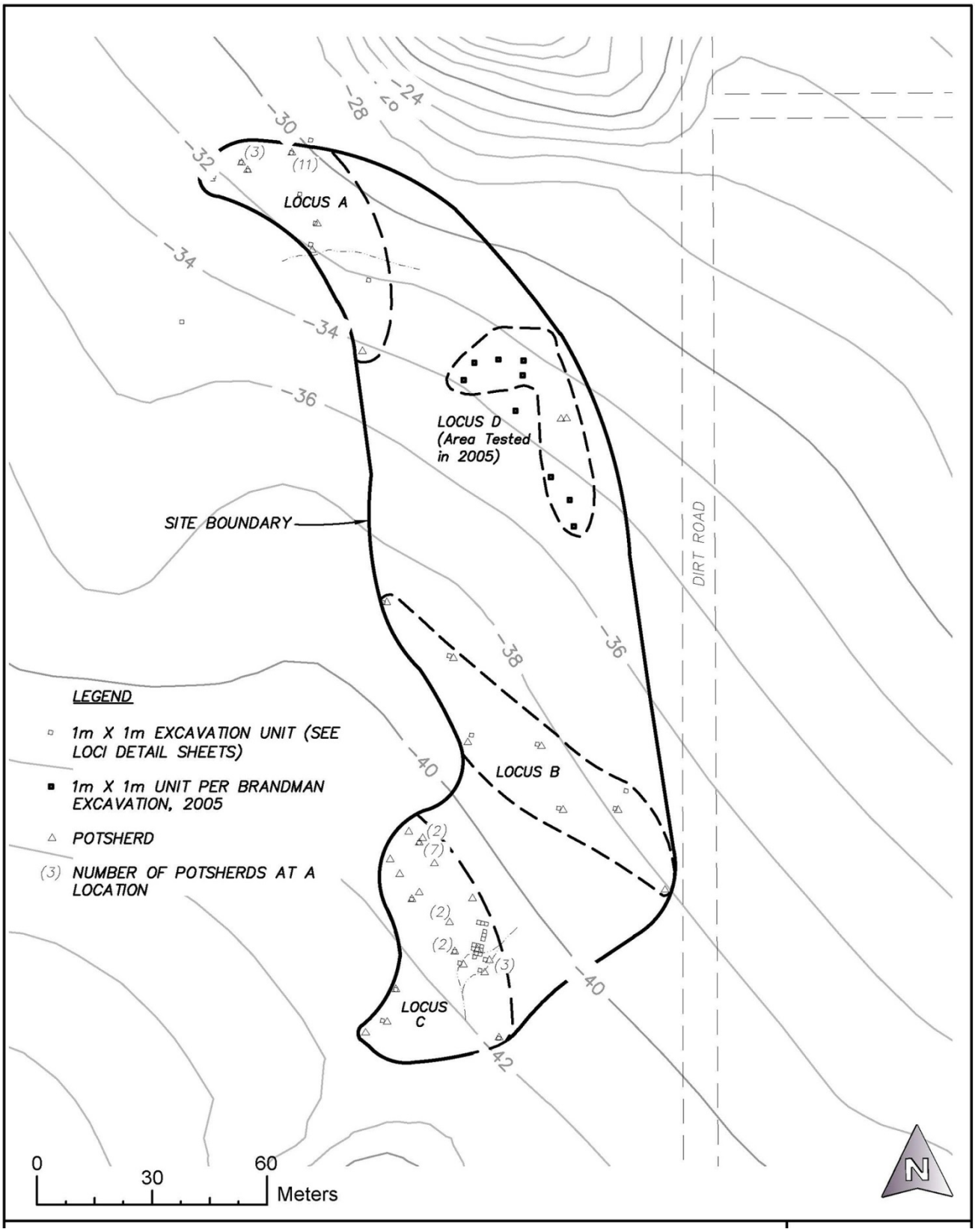


Figure 17: Revised Map of RIV-7834 showing Loci A-D

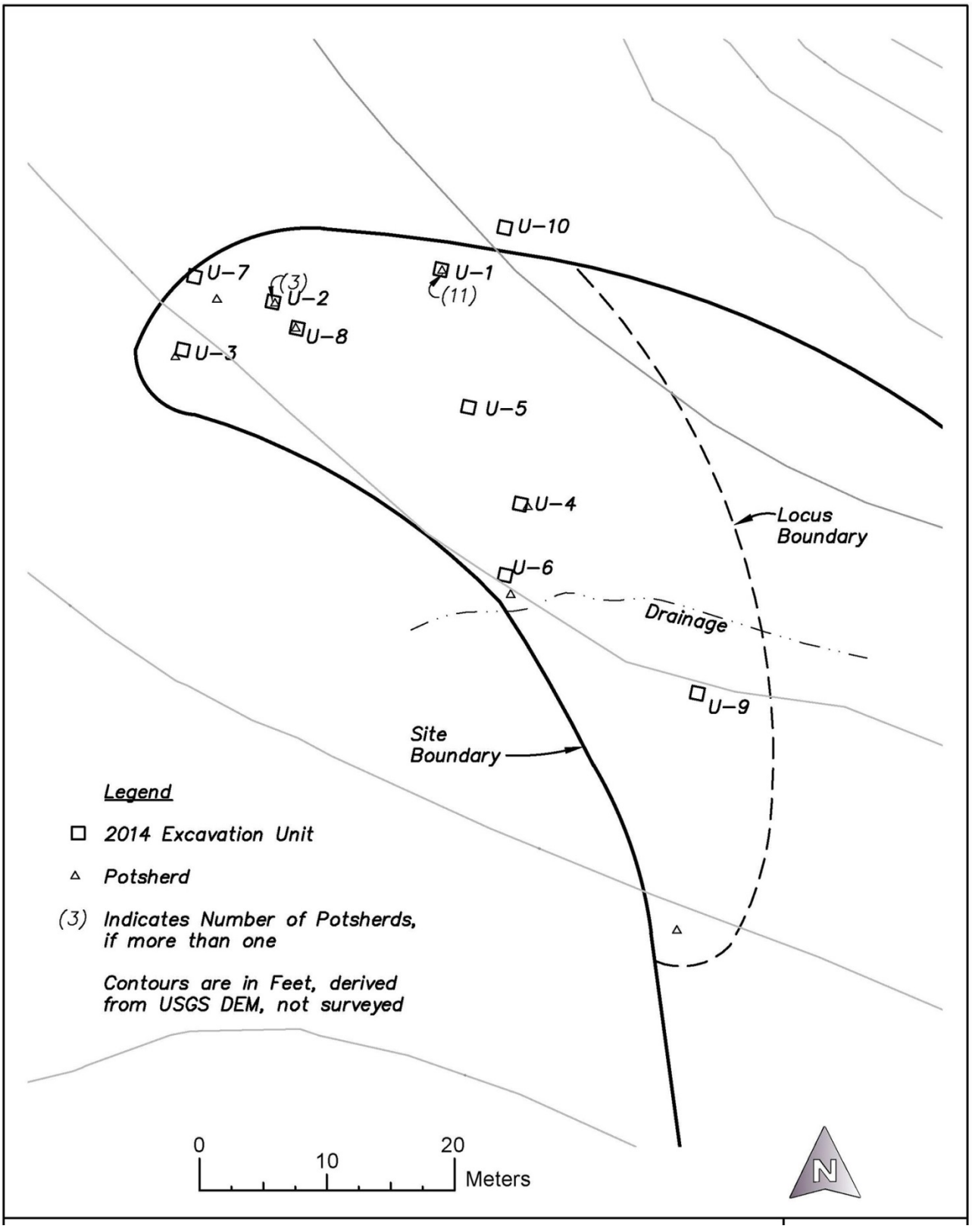


Figure 18: RIV-7834, Locus A showing Units 1-10

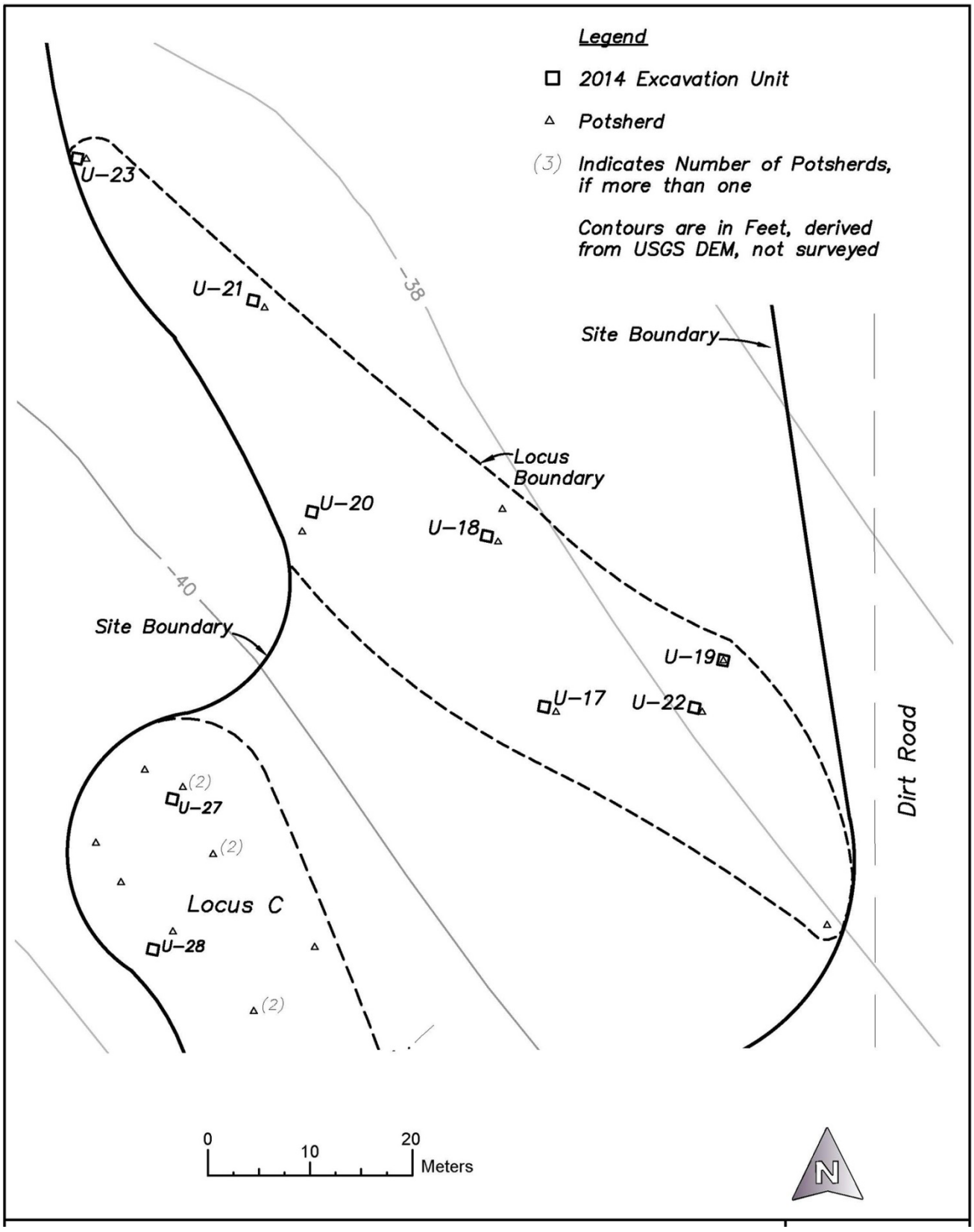


Figure 19: RIV-7834, Locus B showing Units 17-23

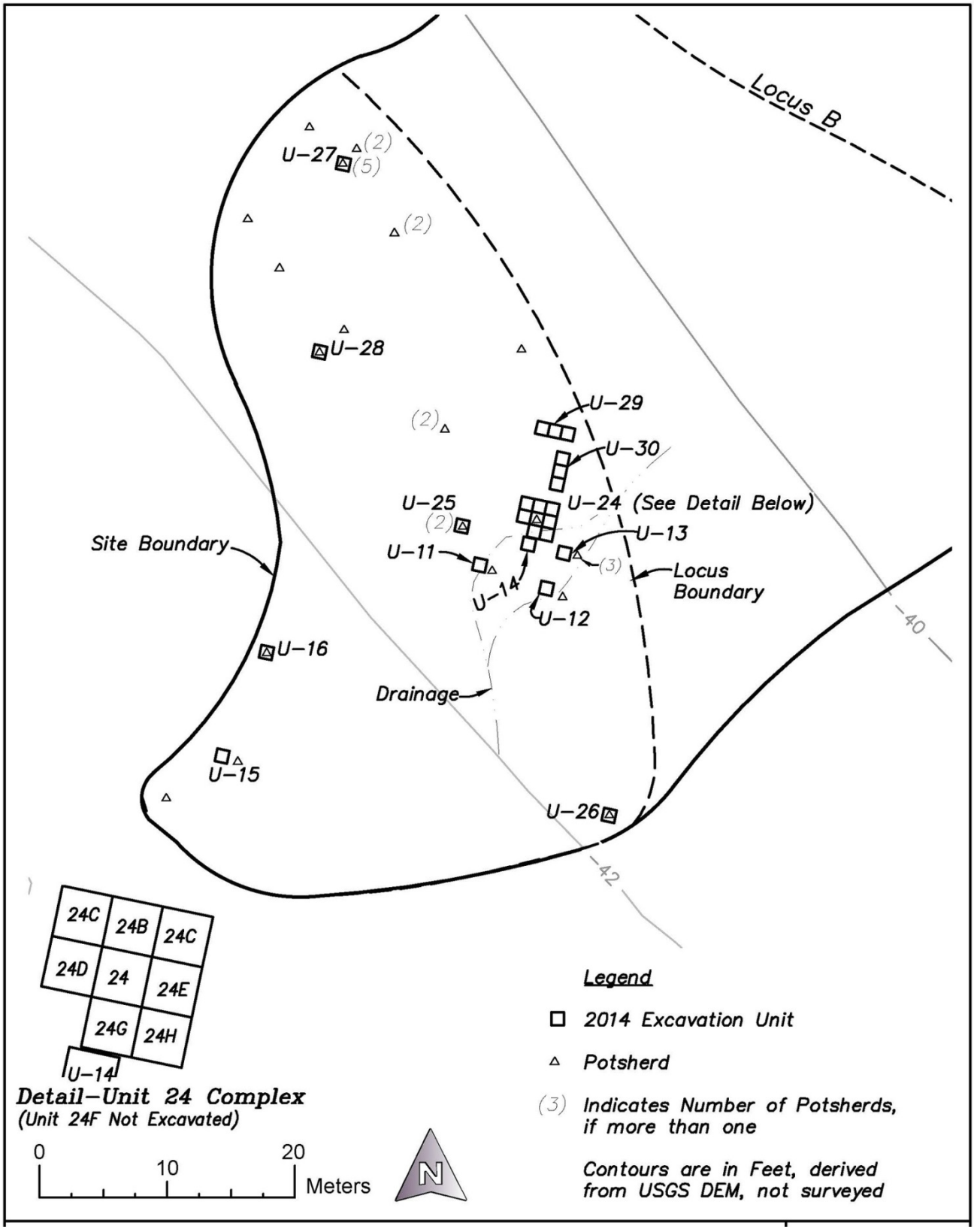


Figure 20: RIV-7834, Locus C showing Units 11-16 and 24-30

Photo 7: Saltbush-creosote scrub mix from top of dune above Locus A looking down on Units 1 (left) and 2 (right) facing southwest

Photo 8: Laying Out Unit 1 at Locus A near base of dune facing northeast

Locus A

Artifacts

Locus A is situated just southwest of a 5-7 m dune at the northern end of the site (see Figure 17). It measures 68 x 21 m in size and includes 20 surface pottery sherds. Most are clustered in the northwestern end of the locus, including one cluster of three sherds and another cluster of 11 sherds that may represent a pot drop. Ten 1 x 1 m units were excavated in this locus (Units 1-10). Findings included mostly pottery sherds along with a fish vertebra which may not be cultural recovered from the 0-20 cm level of Unit 3 and a large metal washer from the 0-20 cm level of Unit 4 (see Figure 18). The distribution of the ceramics is shown in Table 2 below.

Table 2: Distribution of Pottery Sherds in Locus A

Unit	Surface	0-5 cm	10-15 cm	20-40 cm	30-35 cm	TOTAL	Maximum Unit Excavation Depth	OTHER Artifacts
1	4*	2*				**6**	110 cm	
2	2*					**2**	40 cm	
3	2					**2**	40 cm	fish vertebra, 0-20 cm
4	1	7		1	2	**11**	60 cm	washer, 0-20 cm
5						**0**	40 cm	
6						**0**	40 cm	
7			1			**1**	40 cm	
8	1					**1**	40 cm	
9						**0**	40 cm	
10						**0**	80 cm	
Surface	1					**1**	NA	
TOTAL	**11**	**9**	**1**	**1**	**2**	**24**		

*Many of the sherds recovered from the surface and/or upper 5 cm from these two units were very tiny and were ultimately not counted as potsherds and were not analyzed due to their very small size.

We can see by the distribution of the ceramics that 20/24 (83.3%) of the potsherds were found in the upper 0-3 cm. Units 1 and 4 had the most sherds and in both cases most of the sherds belonged to a single pot that was probably dropped and broken on site. With time, including potential historic agricultural activity, some of the sherds moved down to lower levels, especially in the case of Unit 4 which also contains the historic washer.

No features were encountered at this locus. In short, it essentially consists of a surface and near-surface ceramic scatter. Evidence for historic-period disturbance was noted primarily in Unit 4 (see below).

Locus A Stratigraphy

While Dice and Messick (2005:24) stated that “wind-blown sand movement and agriculture has altered the original land surface and subsurface stratigraphy” in Locus D, this was not clearly evident in Locus A, except for Unit 4 where pottery from the same vessel was distributed downward to 30-35 cm in depth and a large historic washer was recovered in the upper 20 cm. In addition, Unit 3 exhibited considerable root disturbance resulting from current saltbush scrub vegetation; such root disturbance occurs to a lesser extent in other units.

Unit 1 was excavated to a depth of 115 cm in order to provide a stratigraphic reference profile for Locus A (see Photos 9&10 and Figures 21A&B below). Unit 1 consisted of various alternating layers composed of sand, silt and/or clay. Sand predominates after 48 cm with pebbles becoming common after 60 cm and then cobbles with large cobbles become important after 85 cm.

Most units exhibited a relatively compact, whitish-gray layer in the upper 25-35 cm that was virtually undisturbed (see Photos 11&12 below). This layer is found in most units indicating little or no disturbance in Locus A at a depth below 25 cm; in addition, there is often a relatively distinct and undisturbed layer or layers above this one, suggesting that agricultural disturbance was not extensive here. The relatively compact whitish-gray and grayish silty clay layers (sometimes clayey silt) suggest periods when ponding was common in Locus A (see Figure 21A&B).

Author’s Acknowledgement: The stratigraphic interpretations provided for the loci and feature contexts for RIV-7834 are based on consultation with Judy McKeehan, M.A., of McKeehan Environmental Consultants of San Clemente. Ms. McKeehan examined collected soil samples from Loci A-C, including from the Unit 24 complex, and provided help in characterizing most of the key soil profiles. The stratigraphic profile maps were the product of field notes, consultations with Ms. McKeehan, and the invaluable cartographic help of archaeologist Joel Paulson, M.A. The photographs in the report were provided by the author.

Photo 9: Unit 1, Locus A @ 115 cm facing north with distinct, largely undisturbed strata. Whitish gray band @ 25-30 (Level VIA)

Photo 10: Unit 1 @100 cm facing south; whitish gray band (Level VIA). The time of day produced different lighting/color effects.

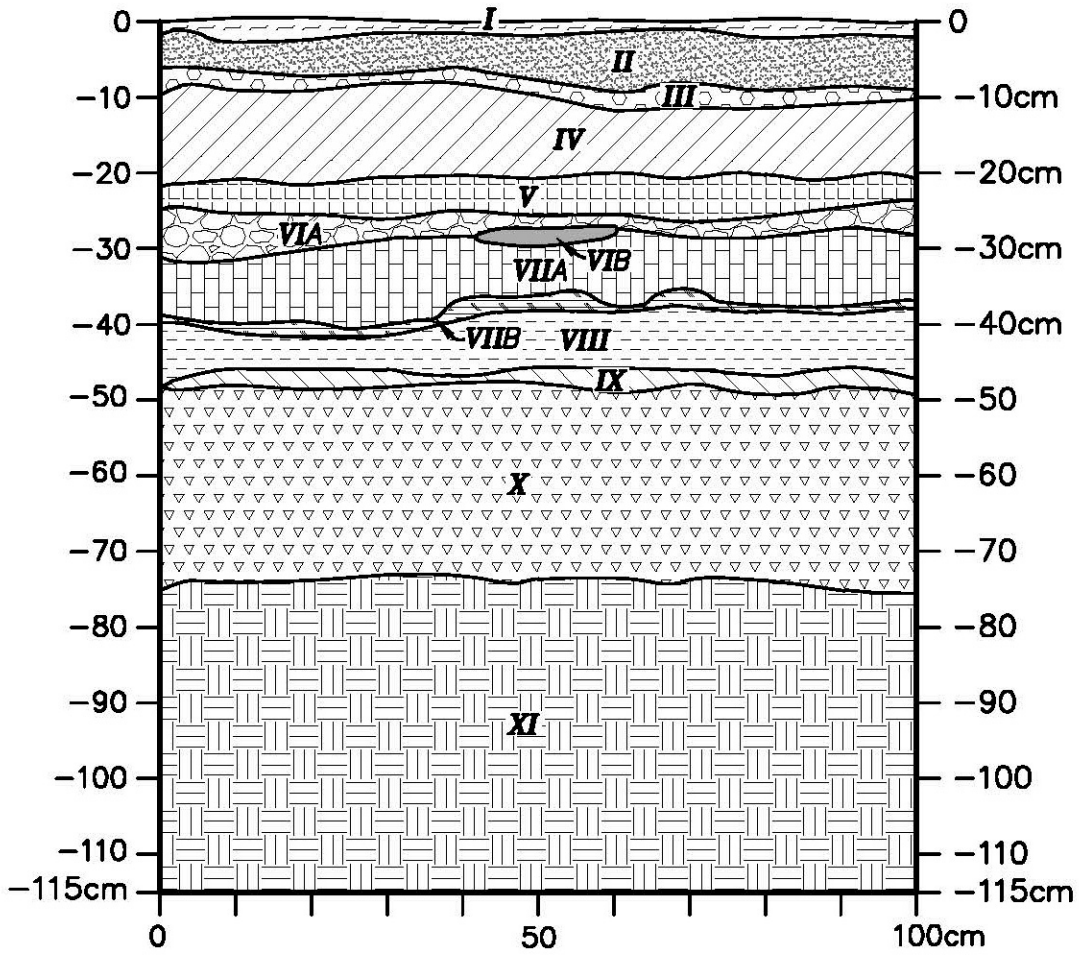


Figure 21A: Stratigraphic Profile, Unit 1, North Wall, Locus A, RIV-7834. See Figure 21B below for strata descriptions.

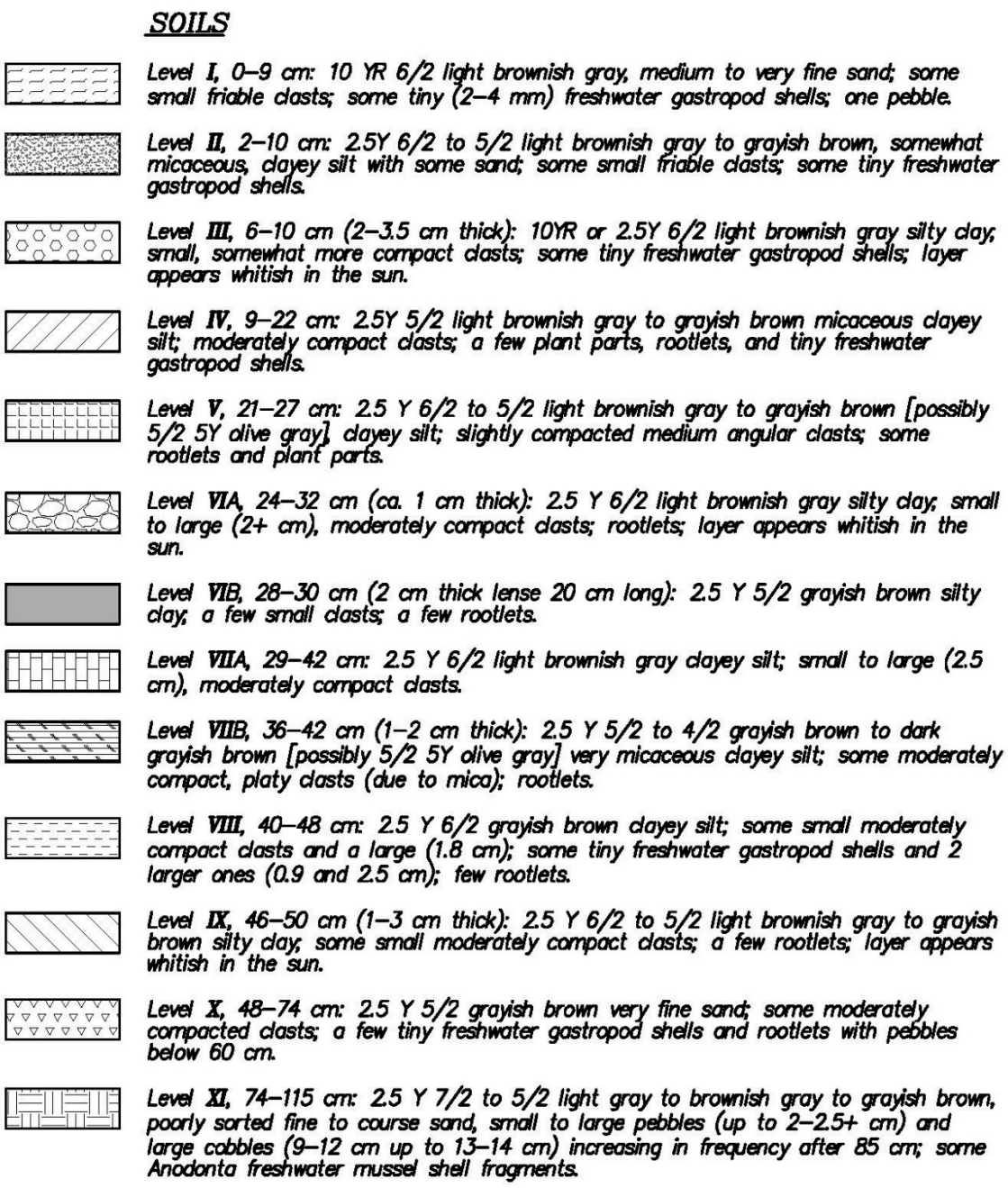


Figure 21B: Soil Strata Descriptions for Unit 1, North Wall, Locus A

Photo 11: Unit 4, Locus A @ ca. 40 cm facing east; note relatively compact whitish-gray layer @ 36-42 cm.

Photo 12: Unit 6, Locus A @ 40 cm facing south; note whitish-gray layer at @ ca. 25-30 cm in all three visible sidewalls.

Locus B

Artifacts

Locus B originally measured 84 x 20 m. One additional surface sherd was encountered which expanded its size to 103 x 20 m (see Figures 17&19 above). The locus consists of a ceramic scatter with eight surface sherds and one sherd recovered during the test excavations in the 0-5 cm level, for a total of nine potsherds. It is essentially a ceramic scatter with 8/9 (88.9%) surface sherds. Table 3 below shows the distribution of potsherds recovered and/or recorded at Locus B. Seven 1 x 1 m units were excavated at this locus (Units 17-23; see Photo 13).

Table 3: Distribution of Pottery Sherds in Locus B

Unit	Surface	0-5 cm	TOTAL	Maximum Unit Excavation Depth
17	1		**1**	40 cm
18	1		**1**	40 cm
19	1	1	**2**	40 cm
20			**0**	40 cm
21	1		**1**	40 cm
22	1		**1**	40 cm
23	1		**1**	40 cm
Surface	2		**2**	NA
TOTAL	**8**	**1**	**9**	

Locus B Stratigraphy

The stratigraphy in Locus B was variable. In some units the influence of nearby vegetation resulted in considerable root disturbance (Units 18, 21 and 23). A relatively unconsolidated layer of sandy gravel was present in Units 17 and 18, a layer which was common in Locus C. Finally, in Units 19 and 22 there was evidence of ponding with multiple alternative layers of more compact clayey silt or silty clay. No stratigraphic reference unit was excavated in Locus B (see Photos 14-16) due to the lack of subsurface artifacts. It should be noted that some of the “root disturbance” in Locus B might also be due to past grape agriculture here, e.g., in Units 17 and 18 (see Photos 14&15 below).

Photo 13: Overview of Units 20 (at left) and 21 (in distance) facing NW

Photo 14: Unit 18 @ 40 cm in Locus B facing east showing root/organic disturbance in the east and south walls

Photo 15: Unit 17 @ 40 cm facing south showing unconsolidated gravel at about 35 cm

Photo 16: Unit 19 @ 40 cm facing east showing compacted white and gray layers indicating a period of ponding (8-14 cm).

Locus D

As noted in Section 3.2.1 above, Locus D was recorded and excavated by Dice and Messick (2005) as site RIV-7834 and Loci A-C were not recorded. Locus D measures 55 x 40 cm in size. The 2005 test excavations consisted of nine 1 x 1 units excavated to at least 40 cm in 20-cm levels (Test Units or TUs 1-9). The authors noted 15 surface sherds (13 were collected) and seven additional sherds were recovered in the 0-20 cm level for a total of 20 collected sherds. The subsurface sherds were from the northwest portion of the locus (TUs 1 and 4). Test Unit 9 was excavated to 120 cm in the south end of Locus D to help understand the broader stratigraphic context of the site. In the 80-100 cm level, shell lenses were noted and a charcoal sample was collected, but no sherds or other artifacts were noted at this depth. Aside from a charcoal sample from the 80-100 cm level of Unit 9, which was not dated apparently due to the absence of a cultural context (Dice and Messick 2005:23-24 and Appendix C Unit Level Records), no other types of artifacts or ecofacts were encountered. In short, Locus D is essentially a ceramic scatter with 15/22 (68.1%) on the surface. It is unknown whether most of the subsurface sherds were in the upper 5-10 cm as such information was not provided. It was evaluated as not a significant historical resource by Dice and Messick (2005:24-27)

Using Waters' (1982) Lowland Patayan Ceramic Chronology, Dice and Messick (2005:23-24) identified the 20 sherds as mostly Salton Buff (9) and Salton Brown (8) with one sherd of Colorado Beige and two unidentified as to type. These sherds were not available for a reanalysis for this report.

Locus D Stratigraphy

On the original site form, it states that agricultural disturbance was noted to a depth of 20-30 cm and that the area was used for grape agriculture between 1952 and 1984 (Dice 2005). However, a check of unit profiles in the unit level records attached to their report suggests that most units had relatively intact stratigraphy as is the case for Locus A (Dice and Messick 2005:Appendix C).

4.2.4 Locus C

Locus Description

The test excavations that took place in late November and early December 2014 Locus C involved the excavation of seven 1 x 1 m units (Units 11, 12A&B, and 13-16; see Figures 17&20). After these excavations site dimensions were determined to be 45 x 13 m. It consisted of seven surface sherds in two clusters: one of five sherds (including a tight group of three sherds) to the northeast and a second group of two sherds to the southwest. However, the discovery of a hearth feature in the northwest corner of Unit 24 on December 7th led to extensive investigations centered on Unit 24 from December 29-31, 2014, with some additional work on March 7, 2015. Robin Lawson, the Tribal Monitor from the Torres-Martinez Indian Reservation, discovered additional surface sherds exposed by a recent rainstorm. This led to the excavation of Test Units 25-28 in areas of new ceramic surface sherds (see Figure 20). The additional surface sherds led to a readjustment of the Locus C boundary as well as the boundary of RIV-7834 itself. Locus C now measures 64 x 40 m. The new dimensions of the entire site RIV-7834 are 240 m (N-S) by 76 m (E-W).

Locus C Stratigraphy

Unit 11 was chosen to be the stratigraphic reference unit and was excavated to a depth of 110 cm (see Figures 22A&B). Its upper 30-45 cm (Levels I-III) consist of slightly to more gravelly sands (Levels IA, IIA, and IIIA) alternating with 1-cm thick relatively compact silty sand layers (Levels IB, IIB and IIIB). Below that is a major layer of micaceous silt (Level IV) followed by silty sand, gravelly sand, and micaceous silty sand layers, with pebbles increasing in frequency after 86 and especially 99 cm. Level IIA consists of a Munsell 2.5 Y 7/2 to 6/2, light gray to light brownish gray, gravelly course to fine sand with a few tiny freshwater gastropods. This unconsolidated gravelly sand layer was later found to be typical throughout much of Locus C, and was found in Unit 11, 12A&B, 13-15, the Unit 24 complex, 25, and 27-30. Only Units 16 and 26 on the southwestern and southeastern edges of the locus did not have this unconsolidated gravel layer. Today, water in the area tends to drain through the gravel layer area, especially through Units 12-14 and the Unit 24 complex (see Figure 20).

Additional stratigraphic information in reference to the hearth features will be discussed below.

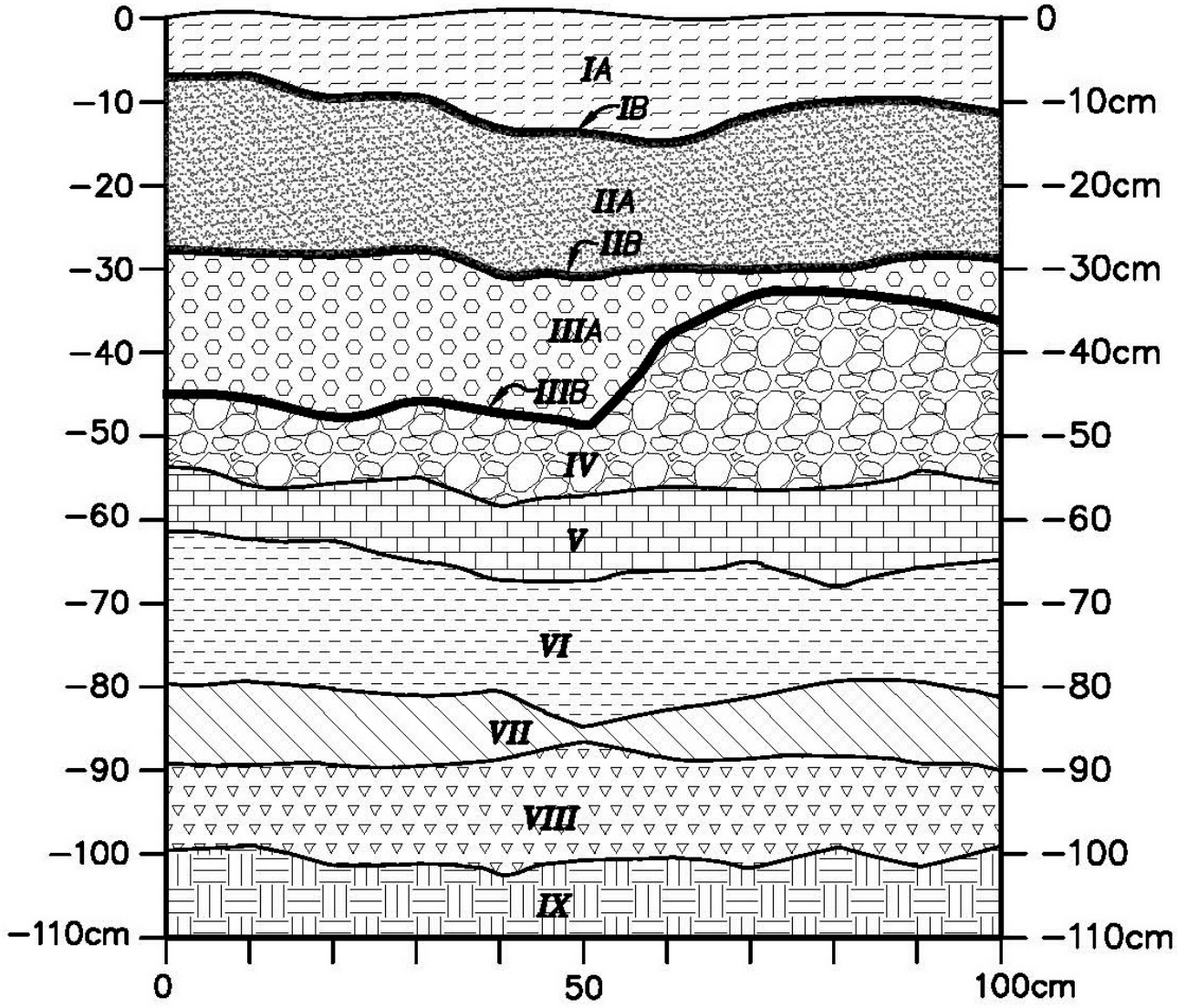
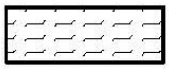


Figure 22A: Stratigraphic Profile, Unit 11, West Wall, Locus C, RIV-7834.
See Figure 22B below for strata descriptions.

SOILS

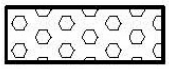


Level IA, 0–16 cm: 2.5 Y 7/2 to 6/2 light gray to light brownish gray gravelly sand with some pebbles 0.5 to 0.8 cm long.

Level IB, 7–16 cm (ca. 1 cm thick): 2.5 Y 6/2 light brownish gray silty sand (very fine to medium); moderately sorted; some tiny and 2 larger (0.9 cm) freshwater gastropod shells.

Level IIA, 7–30 cm: 2.5 Y 7/2 to 6/2 light gray to light brownish gray, gravelly course to fine sand; a few tiny freshwater gastropod shells; a plant root fragment.

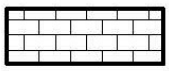
Level IIB, 26–30 cm (ca 1 cm thick): 2.5 Y 6/2 light brownish gray very fine silty sand with a few pebbles; small to large (1.8 cm) moderately compact clasts; some tiny freshwater gastropod shells and large Anodonta freshwater mussel; some rootlets.



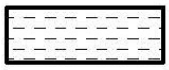
Level IIIA, 24–48 cm (becomes only 5 cm thick in north half): 2.5 Y 7/2, but mostly 6/2, light gray to light brownish gray gravelly sand; a few rootlets.

Level IIIB, 32–48 cm (ca 1 cm thick): 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown, slightly micaceous, very fine silty sand; some moderately compact clasts; rootlets; some tiny and one larger (0.9 cm) freshwater gastropod shells.

Level IV, 32–58 cm: 2.5 Y 6/2 to 4/2 light brownish gray to grayish brown to dark grayish brown, micaceous silt; a few friable clasts; some tiny freshwater gastropod shells and small rootlets.

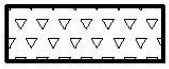


Level V, 53–67 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown; very fine, micaceous silty sand to sandy silt; abundant tiny freshwater gastropod shells; a few rootlets.

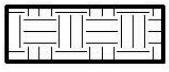


Level VI, 61–84 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown, micaceous, slightly to somewhat gravelly fine to medium sand with a few tiny pebbles; a few tiny freshwater gastropod shells; some rootlets.

Level VII, 79–90 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown, micaceous clayey silt with a bit of gravel; some moderately compact medium (1+ cm) clasts.



Level VIII, 86–102 cm: 2.5Y 7/2, but mostly 6/2, light gray to light brownish gray gravelly fine to coarse sand with some tiny pebbles.



Level IV, 99–110 cm: 2.5 8/2 (white) to 5/2 (grayish brown), but mostly 7/2 and 6/2 light gray to light brownish gray sandy gravel with many small pebbles.

Figure 22B: Soil Strata Descriptions for Unit 11, West Wall, Locus C

Artifacts and Features

Excluding tiny non-diagnostic sherd fragments, artifacts recovered from Locus C include about 110 pottery sherds, including at least 10 bowl rims, a bowl base, and at least 4 jar rims and a jar base and body sherd. Common types include Salton Brown, Tumco Buff, and Topoc Buff. No flaked stone or ground stone artifacts were recovered of any kind. A single fish vertebra which may not be cultural was recovered from Locus A and a tiny burnt bone (non-human) was recovered from Locus C. No human remains were found. One historic artifact, a washer from a probable vehicle was also recovered. The rest of the artifacts were part of three hearth features in Unit 25 and the Unit 24 complex in Locus C. These included abundant fire-altered rock and charcoal. In the following sections, the results of the analyses of the fire-altered rock, charcoal and ceramics as well as the results of three charcoal-based radiocarbon dates will be presented. These results will also be discussed in the context of site stratigraphy.

Fire-Altered Rock (FAR)

A total of 79 FAR were recovered, all from Locus C. The distribution of the FAR is presented in Table 4 below. Rock types included mostly granite along with granodiorite, quartz monzonite, quartz diorite, gneissic, and several that were schist-like or a metamorphosed schist-granitic mix. There was at least one sandstone and one metasedimentary FAR identified. Most of the FAR is relatively small weighing between <50 to 150-200 g with a few outliers. The hearth in Unit 25 included a very highly fire-affected granitic stone weighing 1.9 kg. Other exceptions include a 510 g rock from Unit 24; a 240 g rock from Unit 24A that is probably FAR; 290 and 300 g rocks from Unit 24 B; a 490 g rock from Unit 24E; three rocks ranging from 370 to 410 g from Unit 24G; and a 1.69 kg granitic rock that may not be FAR, also from Unit 24G. FAR identifications and weights are listed in the artifact catalog in Appendix F.

The data provided in Table 4 indicate that most of the FAR were granite/granitic (48%), metamorphic granitic/schist-like (17%), and quartz diorite (11%). Small amounts of quartz monzonite, granodiorite, and gneissic rocks were also identified (5-6%) with sandstone and metasedimentary rocks being rare (1%).

The mountains surrounding Coachella Valley are part of the Southern California Batholith which is large-scale intrusion of plutons that were injected into the crust over a 10 million year period and is composed of various igneous rocks: granite, diorite, quartz diorite, granodiorite, and quartz monzonite (Ownby and Lavayén 2010:4). Given the location of RIV-7834 on the east side of prehistoric Lake Cahuilla and relatively close to the neighboring Little San Bernardino Mountains, which are composed of an assemblage of gneiss, quartz-diorite and granitic rocks as well as part of the Chuckwalla metamorphic complex, it is likely the rocks are derived from the east (Ownby and Lavayén 2010:4). The builders of the hearths at Locus C of RIV-7834 probably used locally available cobbles,

Table 4: Distribution of FAR Rock Types from RIV-7834, all from Locus C

Rock Type	Counts	%	Proveniences	Features
granite	38	48.1	25(5), 24(3),24A(5),24B(6), 24C(1), 24D(3), 24E(2),24G(13)	U25 Hearth(5) Hearth #1(17) Hearth #2(13) Other (3)
metamorphic granitic/schist	13	16.5	25(1),24B(4),24D(4),24G(4)	U25 Hearth(1) Hearth #1(8) Hearth #2(4)
quartz diorite	9	11.4	24(2),24A(3),24G(3),24H(1)	Hearth #1(5) Hearth #2(3) Other(1)
quartz monzonite	4	5.1	24(1),24A(1),24B(1),29(1),	Hearth #1(3) Other(1)
granodiorite	4	5.1	24(1),24A(1),24E(1),24G(1)	Hearth #1(2) Hearth #2(1) Other(1)
gneissic	5 (2 with pyrite)	6.3	25 (1),24A(2),24E(1),30(1)	U25 Hearth(1) Hearth #1(2) Other (2)
unknown	4	5.1	24B(2),24C(1),24G(1)	Hearth #1(2) Hearth #2(1) Other(1)
sandstone	1	1.3	24D(1)	Hearth #1
metasedimentary	1	1.3	U24(1)	Hearth #1
TOTAL	**79**	**100.2**	**ALL**	**ALL**

FAR Counts: U25 Hearth = 7 (8.9%); Hearth #1 = 41 (51.9%); Hearth #2 = 22 (27.8%); Other = 9 (11.4%). "Other" includes FAR from Units 24C, E and H which were not clearly associated with either Hearth #1 or Hearth #2 of the Unit 24 complex.
Source: the author identified the granite rocks but the others were identified by Geology Professor Sean Figg of Palomar College, San Marcos, California.

given the relatively small size of many of the rocks, as large local cobbles are not common. The distribution of rocks by hearth does not show any significant differences in rock selection if one takes into account that 52% of the rocks came from Hearth #1 and 28% came from Hearth #2 (see Table 4 above).

Locus C Hearths and Enigmatic Oxidized Zone with Charcoal Spots

Three hearths with charcoal were encountered at Locus C (see Figure 20):

- Portions of a hearth in the northwest corner of Unit 25
- Hearth #1 that was first encountered in the northwest corner Unit 24 but also was found to occupy portions of Units 24A, B and D.
- Hearth #2 which was concentrated in Unit 24G

Hearth in Unit 25

The stratigraphy of Unit 25 is presented in Figure 23A&B and Photo 17 and the plan view of the hearth is shown in Figure 24 and Photo 18. The Unit 25 hearth was found near the base of the unconsolidated sandy gravel layer (Level IVA, 20-36 cm) at a depth of 28 cm. Level IVA corresponds to the gravelly sand layer found in most of Locus C.

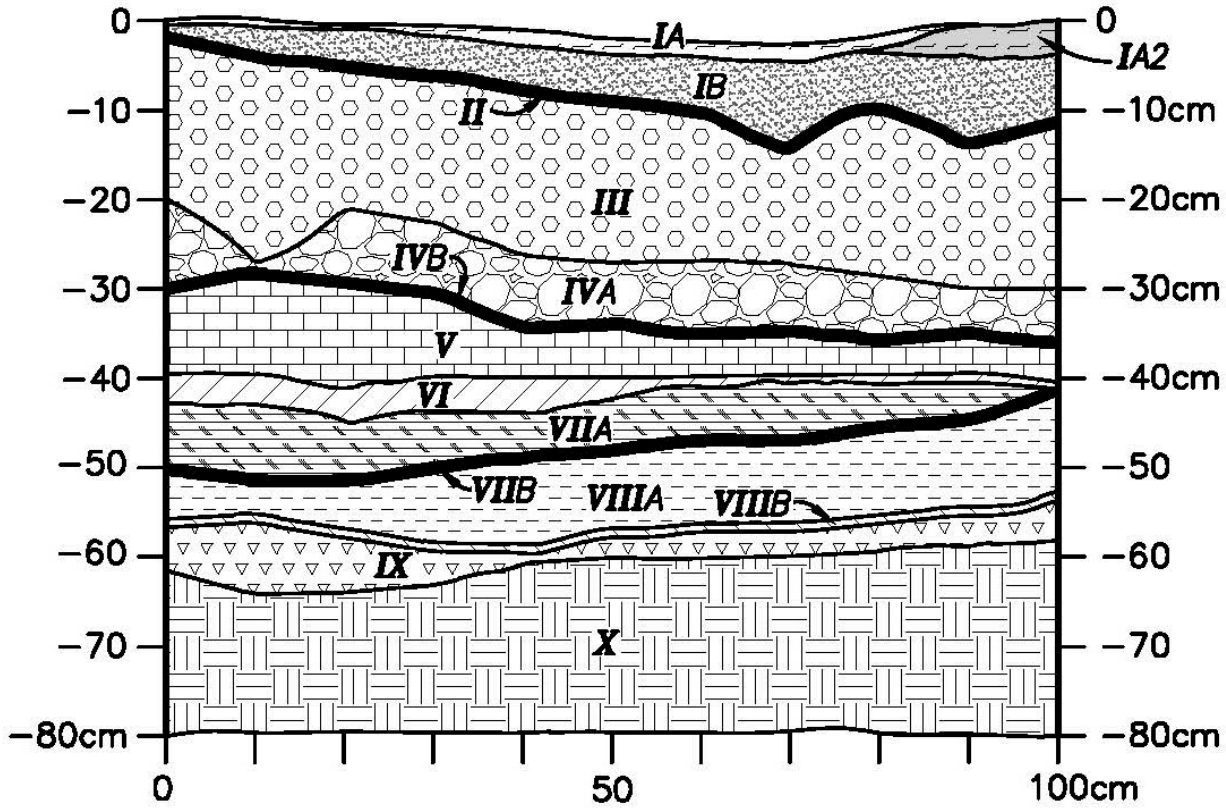
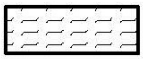


Figure 23A: Stratigraphic Profile, Unit 25, South Wall, Locus C, RIV-7834. See Figure 23B below for strata descriptions.

The hearth consisted of one, possibly two, large granitic rocks, one of which was very blackened and fire-altered with charcoal adhering to its upper surface, and a second that did not appear fire-altered. North of the heavily fire-altered rock was a group of six smaller rocks (four granitic, one gneissic, and one schist-like) associated with some additional charcoal which was later radiocarbon dated. The hearth was situated within the gravelly sand layer that dominates Locus C and where Hearths #1 & 2 were found in the Unit 24 complex (see below). Although the entire hearth may not have been exposed in Unit 25, it appears to differ from the Unit 24 complex hearths by the presence of two very large rocks and only a few small rocks, whereas small rocks dominate in Hearths #1 & 2 and large rocks are quite rare.

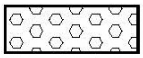
Soils



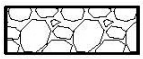
Level IA, 0–4+ cm (IA2–25 cm long lense on west end stained reddish brown with organic matter): 2.5 Y (or 10 YR) 5/2 to 4/2 grayish brown to dark grayish brown, somewhat silty sand; some compact sandy clasts; some tiny freshwater gastropod shells; abundant plant twigs.

Level IB, 0–15 cm: 2.5 Y 6/2 light brownish gray, slightly micaceous, slightly silty fine sand; some small and one large (2.8 cm) moderately compact clasts; rootlets; a few tiny freshwater gastropod shells.

Level II, 2–15 cm (ca. 1 cm thick): 2.5 Y (or 10 YR) 7/2 to 6/2 light gray to light brownish gray very fine sandy silt with clay; moderately compact clasts (0.5 to 2.8 cm); small to medium rootlets enmeshed horizontally in layer.

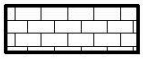


Level III, 5–30 cm: 2.5 Y 6/2 with 5/2 light brownish gray to grayish brown very fine, well sorted sand; a few friable clasts; many tiny freshwater gastropod shells; fine rootlets; charcoal flecks and one bit at 0.4 mm.



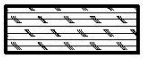
Level IVA, 20–36 cm: 2.5 Y 8/2 to 6/2 white to light gray to light brownish gray coarse, sandy gravel with a few pebbles; charcoal bits. [Hearth feature @ 28 cm in NW unit corner].

Level IVB, 28–35 cm (ca. 1 cm thick lense, east 40 cm only): 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown gravelly sandy silt with some clay and a few pebbles; some moderately compact clasts (0.6 to 1.9 cm); small rootlets; some tiny freshwater gastropod shells.



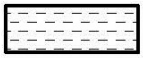
Level V, 28–42 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown very fine, well sorted sand; a few tiny freshwater gastropod shells and rootlets with single large root cover.

Level VI, 40–45 cm: 2.5 Y 7/2 to 5/2 light gray to light brownish gray to grayish brown somewhat gravelly (with small pebbles) sand; some rootlets; a few tiny freshwater gastropod shells.



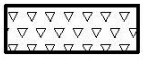
Level VIIA, 42–53 cm: 2.5 Y 6/2 light brownish gray very fine well sorted, slightly silty sand; rootlets and tiny freshwater gastropod shells very rare.

Level VIIB, 43–53 cm (ca. 1 cm thick): 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown micaceous silty clay; large relatively compact clasts (3–4 cm); some rootlets somewhat like Layer II.



Level VIIIA, 43–59 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown, sandy silt with some clay; a few small slightly compact clasts; some rootlets.

Level VIIIB, 54–59 cm: 2.5 Y 6/2 to 5/2 light brownish gray to grayish brown, silty clay with 3–4 cm long compact clasts; many rootlets.



Level IX, 54–64 cm: 2.5 Y 6/2 light brownish gray slightly silty, fine sand; a few small friable clasts; rootlets; a few tiny freshwater gastropod shells.

Layer X, 58–80 cm: 2.5 Y 6/2 (light brownish gray) to mostly 5/2 grayish brown clayey silt; 1 to 4 cm slightly to moderately compact clasts; a few fine rootlets; abundant tiny and larger (up to 1.5 cm) freshwater gastropod shells.

Note: Anodonta sp. Freshwater mussel shells were found in several sandy to gravelly levels.

Figure 23B: Soil Strata Descriptions for Unit 25, South Wall, Locus C

Photo 17: Unit 25 south wall stratigraphic profile; the hearth was in the gravel layer (Level IV) shown in the stratigraphic drawing below.

Photo 18: Unit 25 hearth with blackened granitic rock (Rock #3 in Fig. 24) and charcoal-stained soil in corner (facing west).

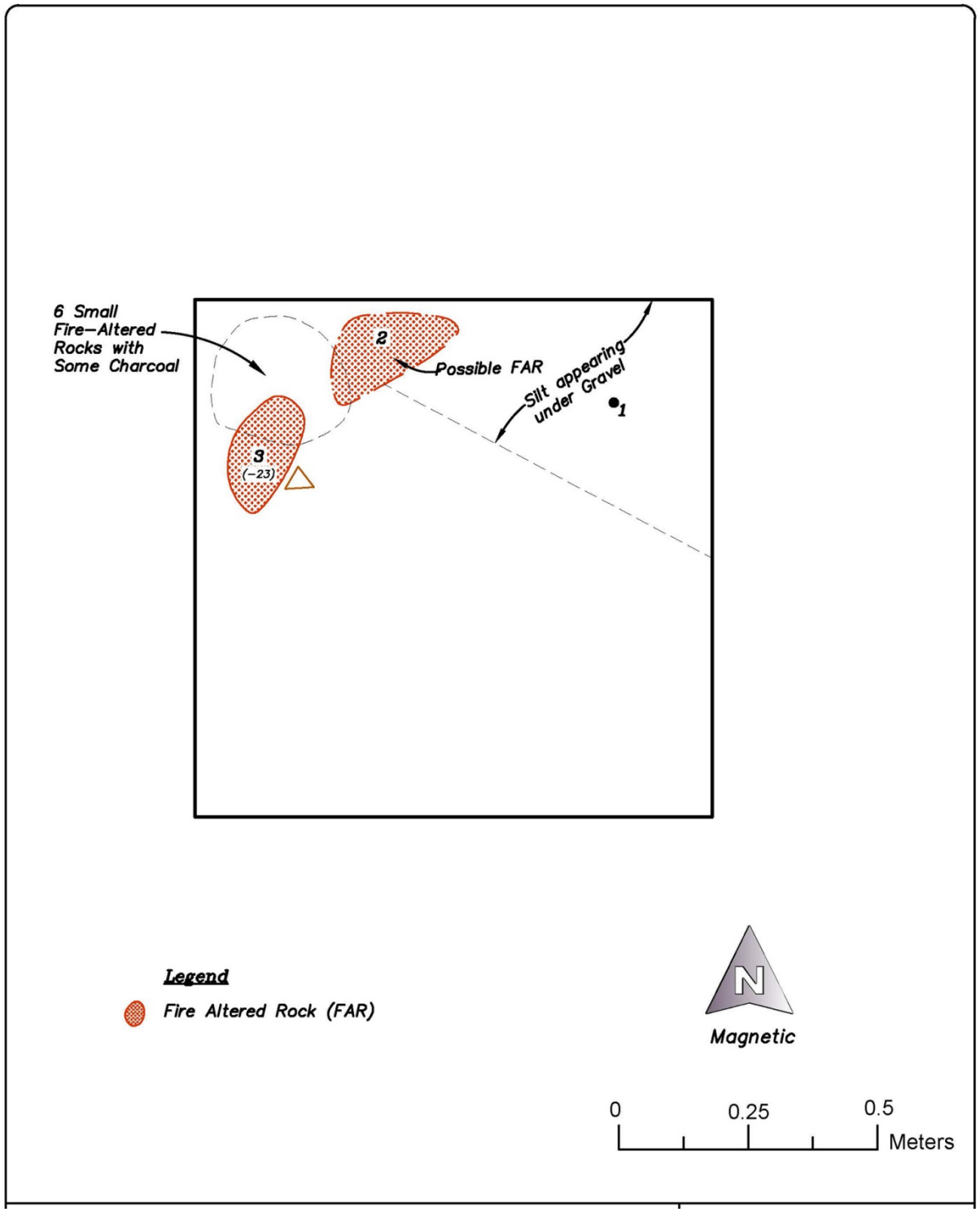


Figure 24: Hearth feature at depth of 28 cm in the NW corner of Unit 25, about 5 m west of the Unit 24 Complex (Figure 20). 1 = silt layer begins to appear through Level IV gravelly sand; 2 = large granitic rock which may not be FAR; 3 = heavily fire-altered and and blackened granitic rock first appearing at a depth of 23 cm.

Hearths #1 and #2 in the Unit 24 Complex

Excavation of the Unit 24 Complex. Unit 24 was excavated near the end of the day on December 7th, 2014, and unexpectedly a charcoal-rich hearth was encountered in the northwest corner of the unit (see Photo 19). This led to three days of excavations from December 29-31, which opened up a 3 x 3 m unit with Unit 24 at its center in order to see the extent of hearths in the area (Photos 19&20).

The excavation of Unit 24 (and other units in the vicinity) had shown that the upper soil level (Level I) consisted of a friable, fine micaceous sand with small pebbles that covers an unconsolidated gravelly sand to sandy gravel layer (Level II) into which the hearth was excavated, as was the case in Unit 25 to the west. The Unit 24 complex was excavated by first removing Level I with a trowel, occasionally encountering a potsherd and rarely a piece of FAR. This exposed the charcoal-stained soil associated with Hearth #1 (see Figure 25). All charcoal deposits or stains, potsherds and FAR were carefully mapped as to horizontal position with depth measured using a line level attached to a datum in the northeast corner of the Unit 24 complex. Virtually every charcoal deposit was collected in film canisters for possible future analysis and/or dating. Hearth #2 was revealed in Unit 24G (see Figure 26). Residual charcoal and FAR were found in Units 24C (highly disturbed by nearby saltbush scrub plants), 24E, and 24H. Unit 24F was not excavated (see Figure 25).

Stratigraphy of the Unit 24 Complex. The excavation of the Unit 24 complex revealed a common basic stratigraphy for all nine units, except for perhaps Unit 24C that was heavily disturbed by dense root growth from nearby saltbush scrub. Aside from the hearth features, the four stratigraphic layers common throughout were as follows (see Figure 27A&B and Photos 22&23):

- Level I: friable, fine micaceous sand with small pebbles
- Level II: unconsolidated angular gravel with coarse to fine sand
- Level III: very fine, micaceous silty sand with a few angular pebbles
- Level IV: thin layer of very fine sandy silt with clay, frequently penetrated by roots due to its water retention potential

Aside from the hearth features, the major difference between the northern portion of the Unit 24 complex (Units 24A&B and the northern 30-50% of Units 24 and 24D) was the division of Level II into an upper and lower layer: Layer IIA, a slightly orange-colored, possibly oxidized layer, with scattered spots of charcoal, and Level IIB, the unconsolidated gravelly sand layer without the oxidation and charcoal spots (see Figures 27A&B and Photos 21&22). Root disturbance made it more difficult to make out such differences in Unit 24C.

Photo 19: Hearth #1 as first exposed in the northwest corner of Unit 24

Photo 20: Excavation of Unit 24 Complex (iron frame = Unit 24), facing roughly north. Unconsolidated gravel was difficult to excavate

Photo 21: Units 24A-C (upper area) and Units 24D &24 (lower area)

Photo 22: Note Levels I-III in North Wall of Unit 24A and Level IV exposed in floor of Unit 24A (Photo 23). Note charcoal spots in Level IIA.

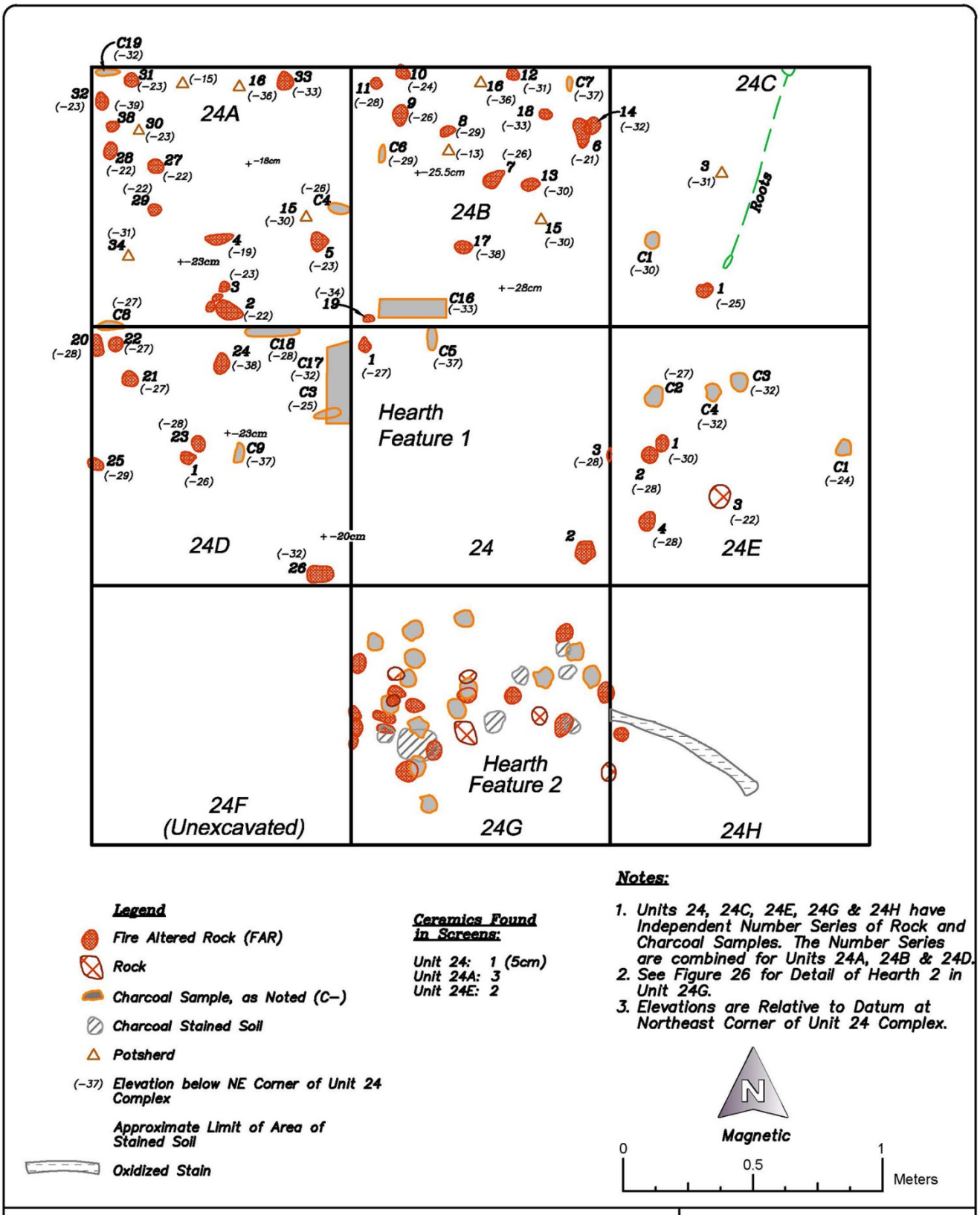


Figure 25: 3 x 3 m Unit 24 Complex showing Hearths #1 and #2

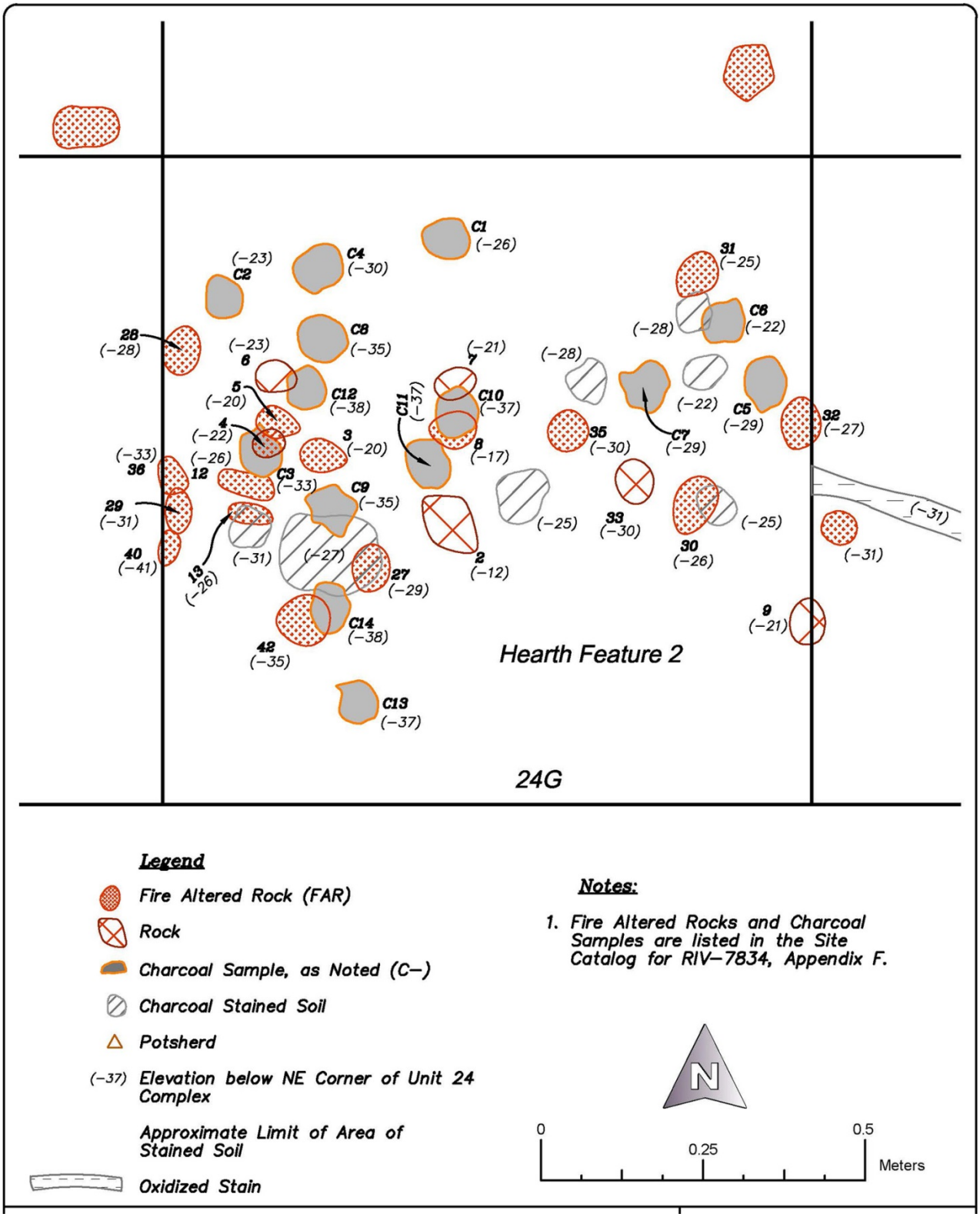
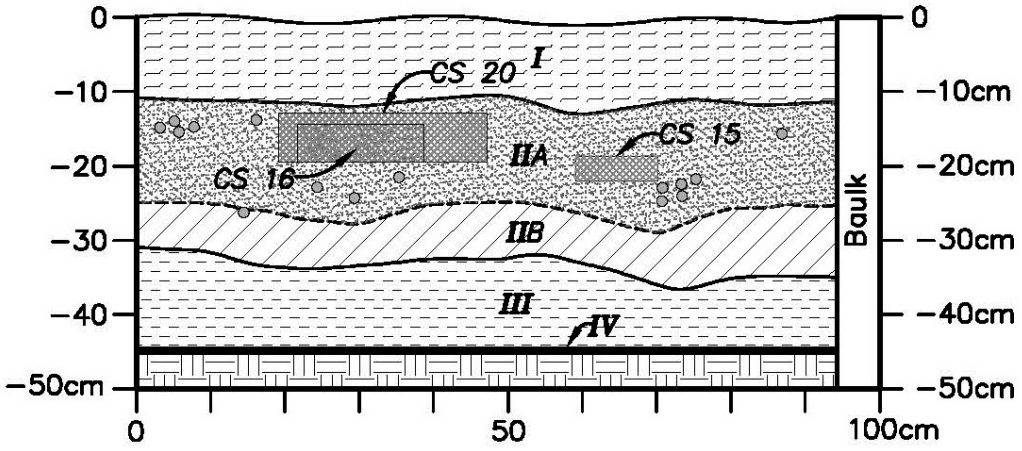


Figure 26: Hearth #2 in Unit 24G



Soils

Level I, 0–13 cm: 2.5 Y (or 10 YR) 6/2 with 5/2 light brownish gray to grayish brown, well sorted, fine micaceous sand with small pebbles; loose with a few small granular clasts; a few plant parts and tiny and few large (0.4 to 0.8 cm) freshwater gastropod shells.

Level IIA, 15–31 cm: (partially oxidized zone, slightly orange in color in sun light): 2.5 Y (or 10 YR) 6/2 to 5/2 light brownish gray to grayish brown angular gravel with minor amounts of silty and very fine sand (some gravel bits are 7/2 light gray); moderate amount of small angular compacted clasts; tiny freshwater gastropod shells; some charcoal bits [in side wall, the layer has dispersed small charcoal concentrations].

Level IIB, 14–34 cm: (non–oxidized zone) with transition to Level III (32–38 cm): 2.5 Y (or 10 YR) 7/2 (light gray) with mostly 6/2 to 5/2 light brownish gray to grayish brown, poorly sorted, angular gravel with coarse sand; some charcoal bits; some tiny freshwater gastropod shells; tiny (6 x 5 x 1 mm) probable burnt bone fragment (Cat # 276).

Level III, 38–51 cm: 10 YR 6/1 with 5/1 light gray to gray, well sorted very fine micaceous silty sand with minor amounts of small angular pebbles; very few granular clasts; some tiny freshwater gastropod shells and large freshwater mussel shells (Anodonta sp.); few plant parts and tiny charcoal bits.

Level IV, 51–52 cm: (< 1 cm thick): 10 YR 7/2 to 6/2 light gray to light brownish gray very fine sandy silt with clay; moderately compact clasts (0.5 to 2.8 cm); small to medium rootlets enmeshed in layer.

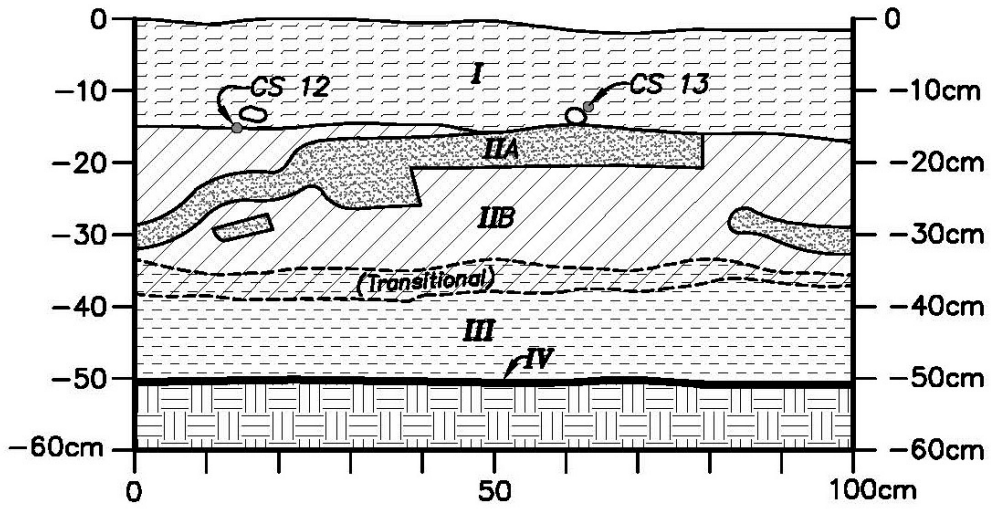
Unexcavated

Legend

Charcoal Sample, as Noted

Charcoal

Figure 27A: Stratigraphic Profile of North Wall of Unit 24A; CS = charcoal samples removed for analysis and/or dating



Soils

Level I, 0–15 cm: 2.5 Y (or 10 YR) 6/2 with 5/2 light brownish gray to grayish brown, well sorted, fine micaceous sand with small pebbles; loose with a few small granular clasts; a few plant parts and tiny and few large (0.4 to 0.8 cm) freshwater gastropod shells.

Level IIA, 15–31 cm: (oxidized zone, slightly orange in color in sun light): 2.5 Y (or 10 YR) 6/2 to 5/2 light brownish gray to grayish brown angular gravel with minor amounts of silty and very fine sand (some gravel bits are 7/2 light gray); moderate amount of small angular compacted clasts; tiny freshwater gastropod shells; some charcoal bits [in side wall, the layer has dispersed small charcoal concentrations].

Level IIB, 14–34: cm (non–oxidized zone) with transition to Level III (32–38 cm): 2.5 Y (or 10 YR) 7/2 (light gray) with mostly 6/2 to 5/2 light brownish gray to grayish brown, poorly sorted, angular gravel with coarse sand; some charcoal bits; some tiny freshwater gastropod shells; tiny (6 x 5 x 1 mm) probable burnt bone fragment (Cat # 276).

Level III, 38–51 cm: 10 YR 6/1 with 5/1 light gray to gray, well sorted very fine micaceous silty sand with minor amounts of small angular pebbles; very few granular clasts; some tiny freshwater gastropod shells and large freshwater mussel shells (Anodonta sp.); few plant parts and tiny charcoal bits.

Level IV, 51–52 cm: (< 1 cm thick): 10 YR 7/2 to 6/2 light gray to light brownish gray very fine sandy silt with clay; moderately compact clasts (0.5 to 2.8 cm); small to medium rootlets enmeshed in layer.

Unexcavated.

Legend

Fire Altered Rock (FAR)

Charcoal Sample (CS), as Noted

Figure 27B: Stratigraphic Profile of the North Wall of Unit 24B; CS = charcoal samples removed for analysis and/or dating

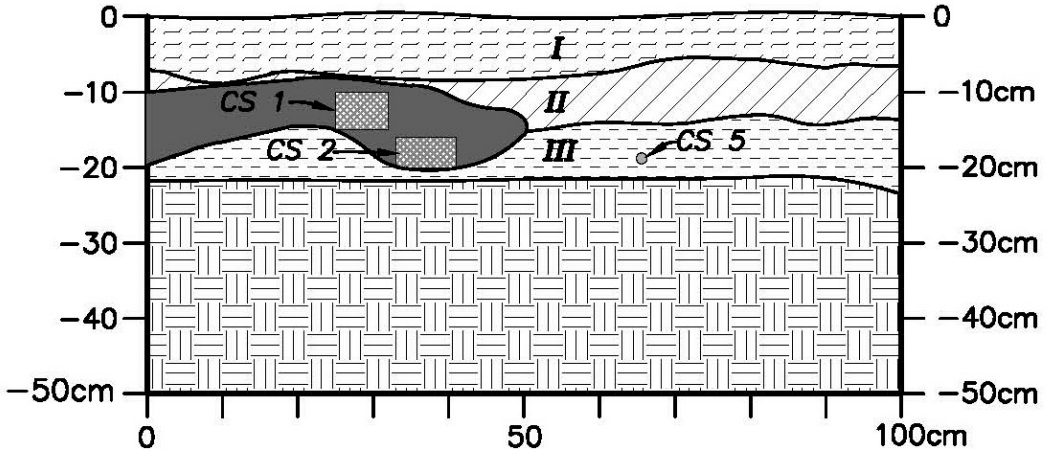
Photo 23: Level IV (somewhat compacted, very fine sandy silt with clay) with embedded plant roots seeking moisture (Unit 24A floor)

Hearth #1 (Figure 25). If we include the material in Units 24, 24A, 24B and 24D, Hearth #1 produced 41 FAR, 18 charcoal deposits, and 10 sherds. Not all sherds are shown in Figure 25 because many were found during the screening of deposits. Hearth #1 (charcoal-stained area in Figure 25) measures about 1.46 x 1.15 or roughly 1.5 x 1.2 m in size. However, the spread of charcoal deposits and FAR extends throughout Units 24A, B and D and to some extent into Unit 24. [The portion of the hearth in Unit 24 was inadvertently destroyed while excavating a unit checking for subsurface pottery in 20-cm levels.]. However, despite the size of the charcoal-stained area and the FAR-charcoal spread, hearth profiles from Units 24, 24A, B and D show a much more complex picture of multiple hearths and hearth blowouts or cleanouts, suggesting multiple reuse of the Hearth #1 area (see Figures 28-32).

Looking at the main hearth that dominates most of the profiles, it appears to have been about one meter in diameter (95-100 cm) and a maximum of 10-11 cm deep. The other characteristic of the hearth area is that most of the FAR are relatively small, weighing between <50 to 200-250 g (about 0.5 lb.) with only a few larger FAR rocks: a 510 g rock from Unit 24; a 240 g rock from Unit 24A that is probably FAR; and 290 and 300 g rocks from Unit 24B. Is the small size of the rocks due to the size of the available rocks in the local area or were small rocks chosen specifically for these hearths. This will be discussed in more depth when site function is discussed below.

Hearth #2 (Figures 25&26). Hearth #2 appears to be relatively localized as it does not clearly extend into Units 24, 24 E, and 24H, although the charcoal and FAR in Unit 24E could be derived from a hearth cleanout of Hearth #2. Unit 24F was not excavated so it is not known to what extent it may have extended further to the west. In a useful coincidence, Unit 14 was previously excavated directly adjacent to what would later become Unit 24G and no hearth remains were encountered there (see Figure 20).

The primary zone of Hearth #2 indicates it was at least 1.1 m (E-W) by 0.8 m (N-S). Hearth #2 was not profiled but its depth can be estimated by the variable depths of charcoal deposits and FAR recovered from it. Excluding a large granitic rock that was not FAR (at 12 cm) depth) and a single FAR at 17 cm, the range extends primarily from depths of 20 to 38 cm, which is about 18 cm total depth. However, Hearth #2 showed no evidence of a continuous charcoal-stained zone as with Hearth #1. It was excavated into the Level II gravelly sand but shows no evidence of an oxidized layer with charcoal spots as we see in the vicinity of Hearth #1. Hearth #2 produced 22 FAR, 14 charcoal deposits, and no pottery sherds.



Soils

*Level **I**, 0–8 cm: 2.5 Y (or 10 YR) 6/2 with 5/2 light brownish gray to grayish brown, well sorted, fine micaceous sand with small pebbles; loose with a few small granular clasts; a few plant parts and tiny and few large (0.4 to 0.8 cm) freshwater gastropod shells.*

Hearth Feature 1.

*Level **II**, 6–15 cm: (non–oxidized zone) with transition to Level III (32–38 cm): 2.5 Y (or 10 YR) 7/2 (light gray) with mostly 6/2 to 5/2 light brownish gray to grayish brown, poorly sorted, angular gravel with coarse sand; some charcoal bits; some tiny freshwater gastropod shells.*

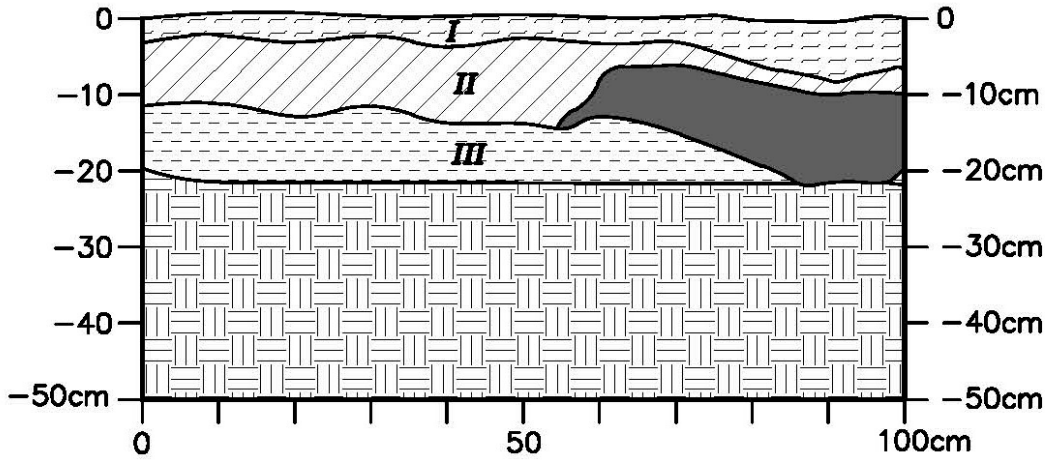
*Level **III**, 13–24 cm: 10 YR 6/1 with 5/1 light gray to gray, well sorted very fine micaceous silty sand with minor amounts of small angular pebbles; very few granular clasts; some tiny freshwater gastropod shells and large freshwater mussel shells (Anodonta sp.); few plant parts and tiny charcoal bits.*

Unexcavated

Legend

Charcoal Sample, as Noted

Figure 28: Hearth #1 as shown in the north wall of Unit 24 (CS = charcoal removed for analysis and/or dating). Note the hearth basin is irregular and extends 50 cm in width and up to 10 cm in depth



Soils

Level I, 0–8 cm: 2.5 Y (or 10 YR) 6/2 with 5/2 light brownish gray to grayish brown, well sorted, fine micaceous sand with small pebbles; loose with a few small granular clasts; a few plant parts and tiny and few large (0.4 to 0.8 cm) freshwater gastropod shells.

Hearth Feature 1.

Level II, 2–15 cm: with transition to Level III (32–38 cm): 2.5 Y (or 10 YR) 7/2 (light gray) with mostly 6/2 to 5/2 light brownish gray to grayish brown, poorly sorted, angular gravel with coarse sand; some charcoal bits; some tiny freshwater gastropod shells.

Level III, 11–22 cm: 10 YR 6/1 with 5/1 light gray to gray, well sorted very fine micaceous silty sand with minor amounts of small angular pebbles; very few granular clasts; some tiny freshwater gastropod shells and large freshwater mussel shells (Anodonta sp.); few plant parts and tiny charcoal bits.

Unexcavated

Figure 29: Hearth #1 in the west wall of Unit 24. Here it is more basin-like and extends about 47 cm in width and is about 10 cm deep

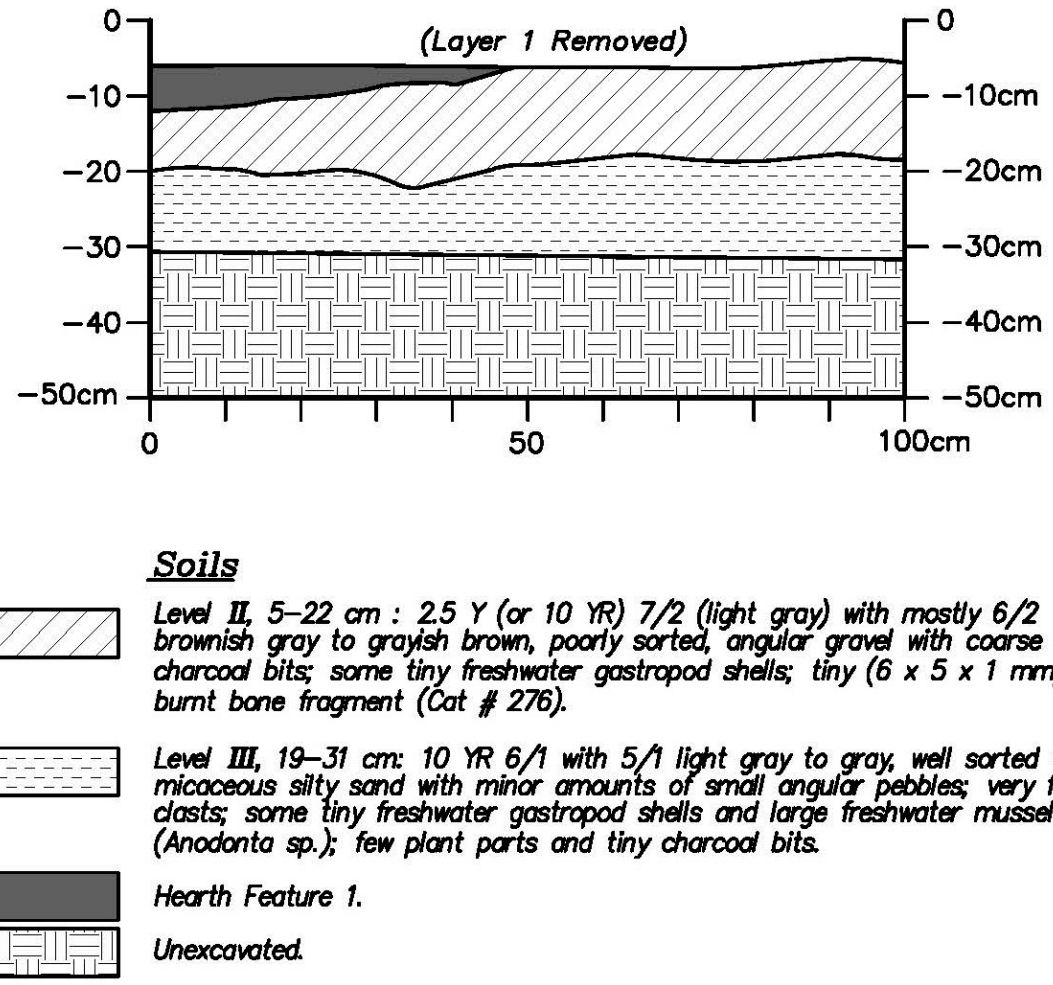


Figure 30: Hearth #1 in east wall of Unit 24D (just west of Unit 24 (see Figs. 28-29 above). The hearth extends 48 cm in width and is 6-7 cm in depth. Level I was removed prior to drawing this profile.

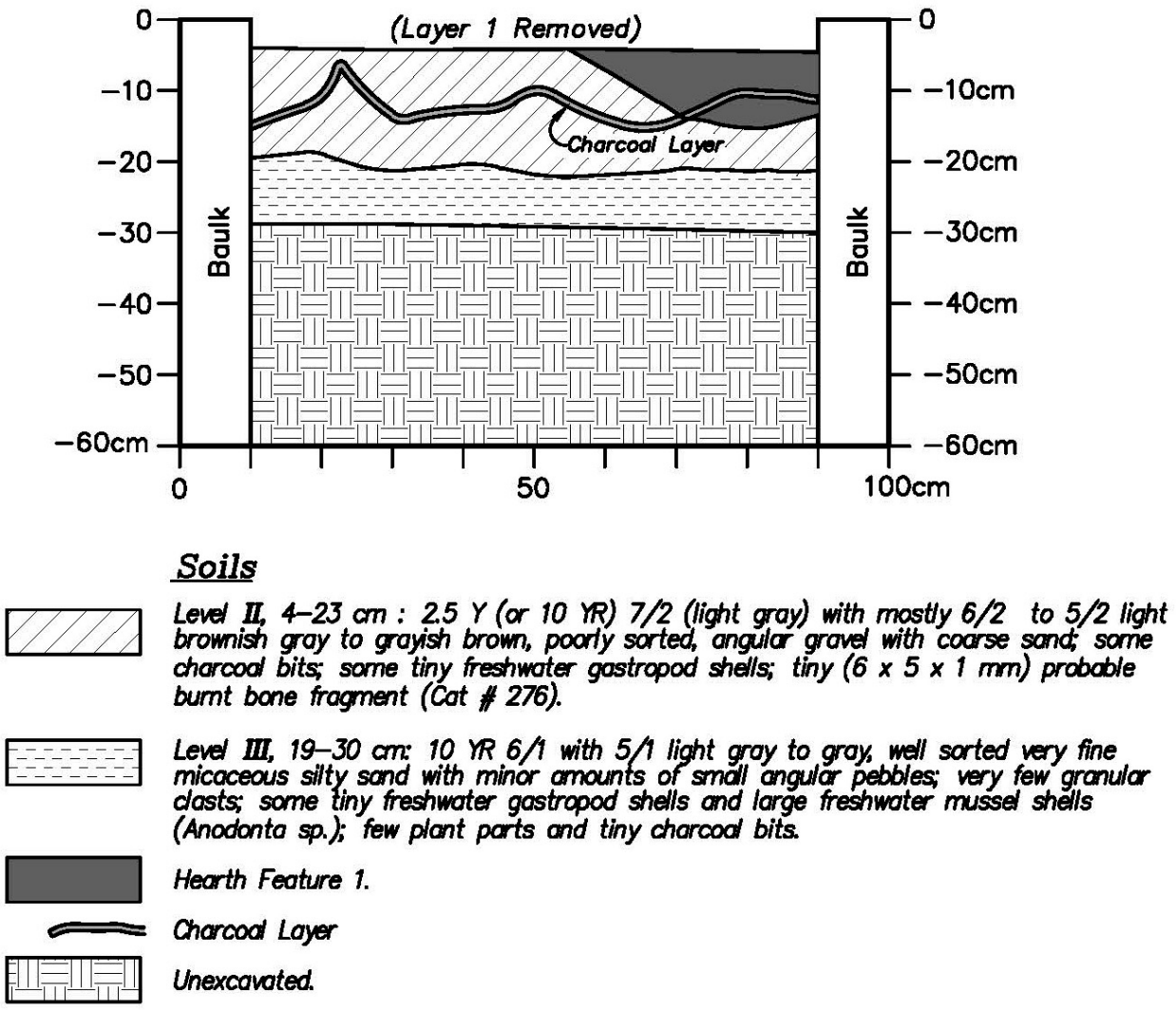
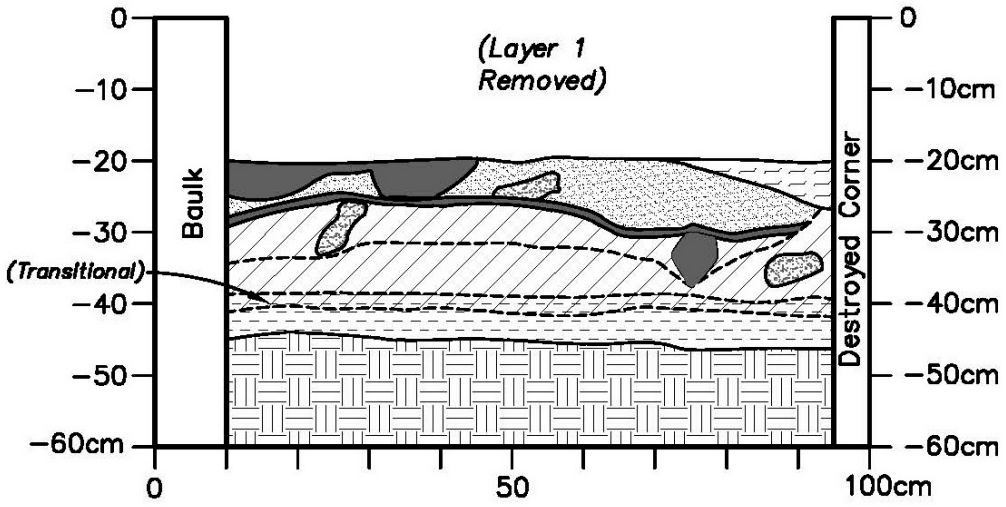


Figure 31: Hearth #1 in the north wall of Unit 24D. It extends about 47 cm in width and is 10-11 cm deep. Note the irregular black line of charcoal/charcoal-stained soil that probably represents the edge of a former hearth (wind) blowout or cleanout.



Soils

Level I, 0–28 cm: 2.5 Y (or 10 YR) 6/2 with 5/2 light brownish gray to grayish brown, well sorted, fine micaceous sand with small pebbles; loose with a few small granular clasts; a few plant parts and tiny and few large (0.4 to 0.8 cm) freshwater gastropod shells.

Level IIA, 21–38 cm: (oxidized zone, slightly orange in color in sun light): 2.5 Y (or 10 YR) 6/2 to 5/2 light brownish gray to grayish brown angular gravel with minor amounts of silty and very fine sand (some gravel bits are 7/2 light gray); moderate amount of small angular compacted clasts; tiny freshwater gastropod shells; some charcoal bits [in side wall, the layer has dispersed small charcoal concentrations].

Charcoal Concentration

Level IIB, 20–40 cm: (non–oxidized zone) with transition to Level III (32–38 cm): 2.5 Y (or 10 YR) 7/2 (light gray) with mostly 6/2 to 5/2 light brownish gray to grayish brown, poorly sorted, angular gravel with coarse sand; some charcoal bits; some tiny freshwater gastropod shells; tiny (6 x 5 x 1 mm) probable burnt bone fragment (Cat # 276).

Level III, 38–47 cm: 10 YR 6/1 with 5/1 light gray to gray, well sorted very fine micaceous silty sand with minor amounts of small angular pebbles; very few granular clasts; some tiny freshwater gastropod shells and large freshwater mussel shells (Anodonta sp.); few plant parts and tiny charcoal bits.

Unexcavated.

Figure 32: Hearth #1 in the west wall of Unit 24B with an irregular profile and a continuation of the line of charcoal/charcoal-stained soil. The main hearth appears to suggest remnants of two hearth features and the pocket of charcoal at the right suggests traces of yet a third hearth. All in all, this profile strongly suggests the Hearth #1 area was used and reused many times, creating a very complex stratigraphy.

Areas Outside of Hearths #1 and 2. The remaining of the Unit 24 complex, Units 24C, 24E, and 24H produced the following:

- Unit 24C: 2 FAR, 1 charcoal deposit, and 1 sherd
- Unit 24E: 4 FAR, 4 charcoal deposits, and 2 sherds
- Unit 24H: 1 FAR and no charcoal deposits or sherds

Unit 24C's stratigraphy has been obliterated in the upper 20-30 cm by the intrusion of dense plant roots and the creation of a compact, organic-rich soil. As noted above, very little cultural material was recovered from this unit.

Unit 24E has sufficient FAR (4), charcoal deposits (4), and sherds (2) to be of interest. The FAR and charcoal may represent a clean-out of either Hearth #1 and/or #2.

Unit 24H produced almost no cultural material and Hearth #2 definitely does not extend eastward into this area.

Oxidized Zone with Charcoal Spots. This is the most enigmatic portion of the local stratigraphy. It is clearly present in the northern half of the Unit 24 complex and the excavation of Units 29 and 30 on March 7, 2015, revealed that it extends 5-6 m to the north of the Unit 24 complex but no hearths are present (see Figure 20). Units 29 and 30 were 1 x 3 m in size and were excavated through Levels I and IIA&B into Level III as described for the Unit 24 complex. A single small FAR and two potsherds were discovered in each unit, but no evidence for any kind of a hearth feature. Charcoal from Level IIA was collected from both units and analyzed to identify what charred foods and/or wood fuels are present as was done for many charcoal samples from Hearths #1 and #2. The results will be discussed below.

Results of Hearth Charcoal Analysis

A few charcoal samples were collected from Locus A, but these samples were from the upper 20 cm with poor contexts and were not studied. No charcoal was recovered from Locus B. Outside of the hearth features, charcoal was recovered only from Unit 11 @ 18 cm, Unit 13 @ 6-14 cm, Unit 26 @ at 35-40 cm, and twice from Unit 27 @ 25-27 in the east wall. These were not analyzed, mostly due to poor context because of plant root disturbance or lack of association with subsurface artifacts.

A total of 36 charcoal samples were collected from the Unit 24 complex, primarily form Units 24 (3), 24A (4), 24B (6), 24 D (5), 24 E (4), and 24G (13). A single sample came from 24C and none from 24F (not excavated) and 24H. Three samples were recovered from Unit 25 mostly from near the hearth feature. Finally, three charcoal samples were collected from the charcoal spots within the oxidized layer within Units 29 and 30 to assess how they might be different than the charcoal recovered from the hearths in the Unit 24 complex.

The analyzed charcoal from the Unit 24 complex came from the Hearth 1 area (Units 24, 24A, B, D) and from Hearth 2 (24G). Samples were also provided from charcoal spot areas found within the oxidized layer from 32-40 cm in Unit 29 and from 32-45 cm in Unit 30.

The charcoal specimens were analyzed by Allison Jaqua, M.A., graduate student and participant in the Integrative Subsistence Laboratory at University of California at Santa Barbara. The goal was to identify the types of fuel used and whether they varied from hearth to hearth as well as to identify the charred material in the charcoal spots in the oxidized areas. Charcoal samples were also checked for charred seeds or other food remains, but none were recovered. Ms. Jaqua wrote a report that discussed the types of wood found and their traditional indigenous uses (see Appendix C).

The plant/wood species identified for Hearths 1 and 2 in the Unit 24 Complex are listed in Table 5 on the next page. It is followed by Table 6 which presents the results for the oxidized layer with charcoal spots collected from Units 29-30. The two types of proveniences are strikingly different in their contents.

Unit 24 Complex Hearth Fuels with Comparison of Hearths 1 and 2

The data from Table 5 shows that a variety of fuels were used and that they mostly come from the local environment: saltbush scrub, creosote bush, mesquite and sage, each identified for 7-8 specimens. Smoke tree and ironwood were also identified but consisted of only one specimen each. Citing ethnographic primary and secondary sources, Jaqua notes that saltbush and creosote were popular fuel sources and that mesquite was also used as a source of fuel, and its wood was a preferred source of fuel for firing pottery (Lightfoot and Parrish 2009; Barbour et al. 2007; see Appendix C). Oak was also important as a fuel particularly by the Kumeyaay for firing pottery (Van Camp 1979). According to Jaqua (see Appendix C), smoke tree grows in “gravelly arroyo margins and channels in the desert scrub environment” and was thus also part of the local environment. However, ethnographic data on this tree is “limited but it may have been used as a fuel source in this region” (Jaqua in Appendix C). Desert ironwood grows in desert washes and was popular for making tool handles and knives and some used its bark as a dye (Timbrook 2007; Barbour et al. 2007; see Jaqua in Appendix C). It was not known as a fuel source and its inclusion may have been incidental.

When comparing the primary fuel sources (saltbush, creosote, mesquite, and sage), the fuels found in Hearths 1 and 2 differ markedly. Hearth 1 contained saltbush (6), sage (6), and creosote (4), with some oak (3), whereas Hearth 2 contained primarily mesquite (7) with smaller amounts of creosote (3) and sage (2), and only one oak specimen. While creosote was used in relatively equal proportions in both hearths, Hearth 1 used primarily saltbush, sage and creosote, whereas Hearth 2 used primarily mesquite and considerably less sage. However,

Table 5: Plant/Wood Genera/Species Identified from the Unit 24 Complex at RIV-7834, Locus C

TAXA	Unit	24	24A	24B	24D	Hearth #1 (24, 24A,B&D)	Hearth #2 (24G)	Taxa Totals
	Cat. Nos.	156	166-167	189-190,192-193	216-217		263, 267-272	
	Depth (cm)	10-15	26.5, 32	16, 19, 29, 31	27 & 37		29, 32, 35, 37(3), 38	
	CS#	1	4 & 19	6-7, 12-13	8-9		5, 9-14	
Saltbush scrub	*Atriplex* sp.			4	2	6	1	7
Creosote bush	*Larvea tridenta*	2	1	1		4	3	7
Iron wood	*Olneya tesota*			1		1	0	1
Mesquite	*Prosopis* sp.		1			1	7	8
Smoke tree (shrub)	*Psorothammus spinosus*					0	1	1
Oak	*Quercus* sp.	1	2			3	1	4
Sage	*Salvia* sp.	1		2	3	6	2	8
ALL		4	4	8	5	21	15	36

Table 6: Plant/Wood Genera/Species Identified from the oxidized layer with charcoal spots in Units 29 & 30 at RIV-7834, Locus C

TAXA	Unit	29	30	30	Taxa Totals
	Cat. No.	280	289	290	
	Depth (cm)	32-40	30	32-45	
Saltbush Scrub	*Atriplex* sp.	1		1	2
Prickly Poppy	*Argemone* sp.		1	1	2
California Buckwheat	*Eriogonum* sp.	3			3
Mesquite	*Prosopis* sp.		1	2	3
Blue Paloverde	*Parkinsonia florida*	1		1	2
ALL		5	2	5	12

given the all sample sizes, one cannot make any grandiose conclusions. The difference might also reflect which fuel was driest and/or closest to the site at the time the hearth was used. In addition, Hearth 1 appears to have been reused multiple times so it is difficult to assign fuels to specific hearth uses, whereas Hearth 2 may have been used only once.

Hearths 1 and 2 vs. Oxidized Layer with Charcoal Spots

The plant/wood species data in Table 5 show a marked contrast between the two areas. In fact, the only species in common are mesquite (3) and saltbush scrub (2). Buckwheat (3), blue paloverde (2), and prickly poppy (2) are completely absent from the hearths. The charcoal spots are not part of hearths and samples from this zone were taken from Units 29 and 30, 5-6 m north of the Unit 24 complex, where no hearths are present. This enigmatic oxidized gravel layer (see Level IIA in Figures 27A&B) may represent and area affected by fire and later reworked by unidentified natural processes creating a scatter of charcoal spots within the fire-affected layer. The species here probably reflect the natural environment at the time and not specific, desired sources of hearth fuel.

According to Jaqua:

- Prickly poppy is a gypsum-tolerant perennial that grows in the loose, powdery silt in hilly areas of the Colorado Desert and several species are native to this region. Its seeds were used as a poultice for burns and as a pain reliever (Zigmond 1981, cited in Jaqua, Appendix C).

- Blue paloverde grows in creosote desert scrub habitat and also in desert washes. The Cahuilla used the dried beans to make flour for cakes and for porridge (Bean and Saubel 1972, cited in Jaqua).

- California buckwheat grows in the desert sand dunes. The Cahuilla ate both seeds and shoots from this plant; it was also drunk as tea to help relieve headaches and stomach pain and to make eyewashes (Barrows 1900:78; Bean and Saubel 1972:72, as cited in Jaqua).

Whether these species suggest slightly different climatic conditions compared to today is not known; however, except for the oak, all of the identified species are “common members of the local vegetation” (Jaqua in Appendix C).

Of particular interest is the presence of oak, since it was used by some groups for the firing of pottery (see below). It commonly grows in the mountain and transition zones of Cahuilla territory, and not in the desert. Scrub oak might have been present along some drainages in the eastern foothills of the Santa Rosa Mountains, but that is many miles to west of the site location. As Jaqua observes:

the presence of *Quercus* (oak) may indicate that different habitats were exploited for firewood or conversely that scrub or chaparral vegetation was present near this site in prehistory (Jaqua in Appendix C).

Basic Descriptive Analysis of Ceramics

Ceramics were recovered from all four loci of RIV-7834, but those from Locus D were not available for analysis. As noted earlier, a total of 20 sherds were recovered by Dice and Messick (2005:23-24), broken down as follows: Salton Buff (9), Salton Brown (8), Colorado Beige (1) and unidentified (2). Based on the study of the ceramics of Loci A-C and given Locus C's occupation between 1290 and 1440 A.D, it is not likely that Colorado Beige was present in Locus D.

Recording of Descriptive Attributes for All Sherds from Loci A-C

Given that 110 sherds are involved and given the difficulty in assigning sherds to Waters (1982) Lowland Patayan Ceramic Typology, which is based on Malcolm Rogers (1936) (see Schaefer in Appendix D2:2), it was decided to carefully describe them (see Appendix D1) and to draw vessel rims, and then submit a sample of 20 sherds for thin sectioning for use in a more refined analysis, including type assignments. Every sherd was examined for the following attributes:

- Catalog Number
- Provenience (surface or by Unit and Depth)
- Vessel wall thickness (mm)
- Sherd size (cm)
- Interior and exterior surface color and other surface characteristics, e.g., does it have protruding surface grains; is scum present (derived from gypsum salts in the clay); is there a chemical blooming effect?
- Surface treatment (WS= well-smoothed, S = smoothed), SS = semi-smoothed, US = unsmoothed, WWS = wet-wipe smoothed)
- Decoration (possible paint or incising), but virtually none was found
- Paste color variation from interior to exterior, core color, and core type (whole, side, sandwich)
- Temper (if present), e.g., crushed sherds (grog), crushed rock, sand
- Paste minerals w/ 40X microscope, e.g., quartz, feldspar, muscovite, biotite, amphibole
- Rim/Lip forms (direct, recurved/ thickened)
- Hardness (soft, medium, hard)/Fracture (uneven to even break)
- Form attributes (bowl, jar, other) and vessel interior orifice diameter
- Ceramic type, when assigned (after Waters 1982)

Loci Surface and Subsurface Sherd Frequencies and Densities

Excluding tiny sherd fragments too small to be useful for analysis, 110 sherds recovered from Loci A-C were analyzed: 25 from Locus A, 9 from Locus B, and

76 from Locus C. The estimated actual number or vessels represented is 10-12 for Locus A; eight for Locus B, and 45-50 for Locus C. The much larger sample from Locus C is due its larger size and higher ceramic density and the much more extensive excavation that took place (ca. 12 m^3 for Locus C vs. 3-5 m^3 for Loci A, B & D). As noted earlier, most of the ceramics in Loci A, B and D were surface ceramics with frequencies of 80%, 89%, and 68%, respectively, whereas only 28/76 sherds (37%) were surface ceramics from Locus C. Subsurface ceramic sherd densities were correspondingly low for Loci A, B, and D: 0.95/m^3, 0.36/m^3, and 1.5/m^3, i.e., <1 and no more than 1.5 sherds/m^3. On the other hand, for Locus C, the subsurface sherd density was 4/m^3, which is still relatively low, however.

Locus C subsurface sherds were distributed in the 1x 1 m Units 11-28 as follows:

Unit 11: 2 sherds at 20-25 cm
Unit 12A&B: 2 at 5-10 cm; 2 at 10-15 cm; 1 at 20-40 cm
Unit 13: 1 at 5-10 cm
Unit 14: 4 at 20-25 cm
Units 15 & 16: none
Unit 24: 1 at 0-5 cm
Unit 25: 1 at 10-20 cm; 2 at 50-55 cm
Unit 26: none
Unit 27: 1 at 10-15; 2 at 20-40 cm
Unit 28: 3 at 0-5 cm; 1 at 20-40 cm
Unit 29 (3 x 3 m): 2 at 25-30 cm
Unit 30 (3 x 3 m): 2 at 30-35 cm

For the Unit 24 Complex (based on depth corrections to align with Unit 24):

Unit 24A: 1 at 10 cm; 5 at 25-35 cm
Unit 24B: 1 at 0-5 cm; 2 at 20-25 cm
Unit 24C: 1 at 20 cm
Unit 24E: 1 at 5-15 cm; at 15-35 cm
Unit 24D, F, G and H: no ceramics in these units

Locus C ceramics were found almost entirely in the sandy silt layer Level I (10-15 cm) and in the unconsolidated gravel layer Level II (10-30 cm); only a few were found at deeper levels, in particular two sherds at 50-55 cm in Unit 25. Many sherds were found in the screen due to the unconsolidated nature of Level II.

Vessel Wall Thickness

Vessel wall thickness was measured for all sherds that could be analyzed and that had at least a good part of both original surfaces, a total of 80 sherds, discounting repeats for the same vessel. The average vessel wall thickness, by locus and by the site as whole, excluding Locus D for which no data were available, is shown below:

- Locus A: mean vessel wall thickness = 4.3 mm (n=13)
- Locus B: mean vessel wall thickness = 4.7 mm (n = 8)
- Locus C: mean vessel wall thickness = 4.4 mm (n = 59)
- **Loci A-C: mean vessel wall thickness = 4.4 mm (n = 80)**

These more quantitative data may be useful to future analysts given the generally qualitative data provided in Waters (1982), e.g., "medium to thin."

Vessel Forms

It is not always easy to be certain if a body sherd is from a jar or a bowl, especially if the sherd is small. Generally, bowls have interiors that are smoother than their exteriors and jar exteriors are almost always better smoothed than jar interiors, except perhaps in the rim and neck areas. Grouping obvious jars with probable jars and obvious bowls with probable bowls, and creating "other" and indeterminate categories, the overall results are in Table 7 below:

Table 7: Frequencies of Bowls and Jars in Loci A-C of RIV-7834

Locus/Loci	Bowl	%	Jar	%	Other	%	?	%	All
A	16	64.0	8	32.0	0	0	1	4.0	25
B	2	25.0	4	50.0	2	25.0	0	0.0	8
C	26	33.8	48	62.3	0	0	3	3.9	77
Loci A-C	44	40.0	60	54.5	1	1.0	4	3.6	110

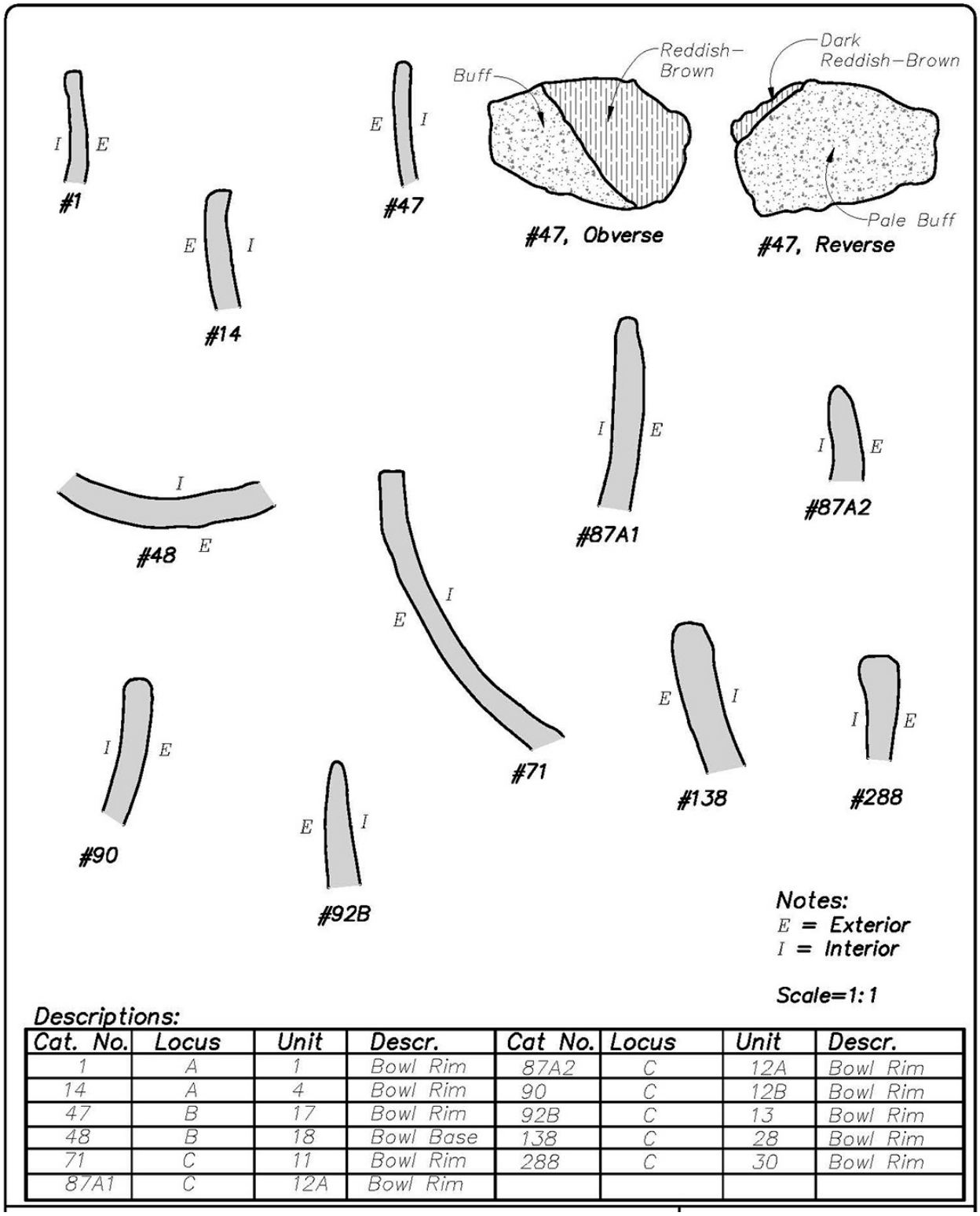
The above results for Loci A-C indicate that about 40% are from bowls and 55% are from jars, with the remainder ca. 5%. Jar and bowl rims were drawn (along with two base sherds) as shown in Figures 33&34 on the next page. A few rim sherds were used to estimate the interior orifice diameters of some of the vessels from Locus C:

- Cat. #71, small bowl fired in reducing atmosphere, 7-8 cm (8 cm high)
- Cat. #87A1, Salton Brown bowl fired in reducing atmosphere: 18 cm
- Cat. #106, Salton Brown jar (olla): 7 cm
- Cat. #136, jar: at least 10 cm
- Cat. #138, jar, Salton Brown bowl fired in reducing atmosphere: 18-20 cm

Cat. #55 from the surface of Unit 23 in Locus B has an unusual form suggesting it may be some kind of relatively flat tableware, such as a plate or perhaps a parching tray, which were known to be made by the Desert Cahuilla (Rogers 1936:28).

Cores and Firing Atmosphere

Pots that are well-fired will tend to burn out any organics within the interior of the paste and produce various colors typical of an oxidizing atmosphere. Those that



Descriptions:

Cat. No.	Locus	Unit	Descr.	Cat No.	Locus	Unit	Descr.
1	A	1	Bowl Rim	87A2	C	12A	Bowl Rim
14	A	4	Bowl Rim	90	C	12B	Bowl Rim
47	B	17	Bowl Rim	92B	C	13	Bowl Rim
48	B	18	Bowl Base	138	C	28	Bowl Rim
71	C	11	Bowl Rim	288	C	30	Bowl Rim
87A1	C	12A	Bowl Rim				

Figure 33: Bowl rim forms, RIV-7834, Loci A-C. All are direct rims, some pinched or thickened lips); in addition the base of a small bowl is also shown (#48).

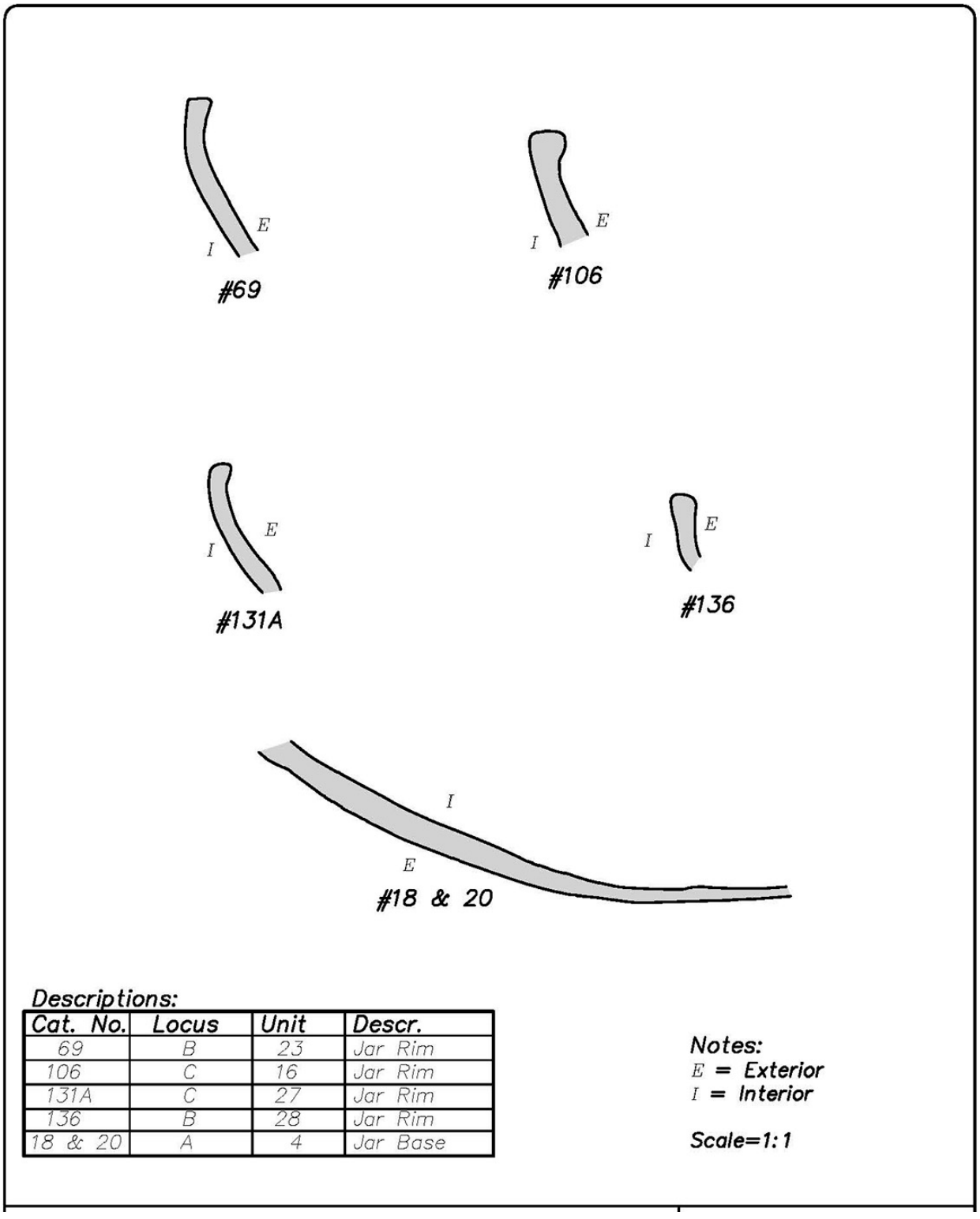


Figure 34: Jar rim forms, RIV-7834, Loci A-C. All are recurved rims, at least one with a thickened lip (#126). A body & base sherd of a jar or olla is also shown (#18&20).

are not well-fired tend to leave carbon cores of varying thickness and placement (sandwich cores, whole cores, side cores), and those that fired in a reducing atmosphere tend to have pale buff, gray or black paste. Locus A had five sherds with cores (20%), Locus B had one (13%), and Locus C had 11 cores (14%). Given the small sample sizes for Loci A & B, these figures may be roughly equivalent.

In terms of vessels fired in a reducing atmosphere, Locus A had none, Locus B and 2 (25%), and Locus C had 11 (14%). In fact, several vessels recovered from Locus C had either a uniformly gray paste or a uniformly black paste. This is somewhat unusual but does occur as a part of Salton Brown, producing pottery that is virtually identical to Pyramid Gray from the Mojave Desert (see discussion of Schaefer in Appendix D2 below; see also Appendix D1).

Ceramic Thin Section Analysis and Assignment to Types by Schaefer

Ram Alkaly of R.A. Petrographics of Los Angeles prepared the thin sections which were then analyzed by Dr. Jerry Schaefer of ASM and Associates of Carlsbad. In addition, Dr. Schaefer and the author had a long conversation about the collection, including the informal assignment of types to some sherds based on macroscopic and 40X binocular microscopic analysis. Schaefer's study of the 20 thin sections, along with 40X binocular microscopic analysis of nine additional sherds, combined with the author's typing of six more sherds based on Schaefer's results, including sherds with similar attributes and/or as part of the same vessel.

Looking at Table 8 below, based on the 33 identified types at Loci A-C, the RIV-7834 assemblage appears to be dominated by Salton Brown (22) along with Topoc Buff (7) and Tumco Buff (4); in addition, there are two indeterminate as to type, both of which were not subjected to petrographic analysis. Most of the remainder of this discussion focuses on observations made by Schaefer (see Appendix D2:2-5).

<u>Introductory Comments</u>

The 20 thin sections represent a very limited number of ceramic types and there is very little variability of mineral characteristics within each type. Interestingly, there are some striking similarities in mineral constituents and fabric characteristics for Topoc Buff and Salton Brown, with the main difference being clay color. Given both are made from sedimentary clay sources in the Colorado Desert, he suggests they were made from clustered clay sources or clays tempered from the same sources. Finally, the overall low variability suggests the pottery was locally made or derives from a population with relatively low mobility or cultural contacts, at least during the occupation of RIV-7834.

Table 8: Ceramic Types and Associated Rim Forms

Cat #	Locus and Unit Provenience	Ceramic Type	Rim Form	Vessel Form
Type Assignments Based on Macroscopic, Binocular, and Thin Section Petrographic Analysis				
1	Locus A, Unit 1	**TOPOC BUFF**	Direct	Bowl
8A(&B)	Locus A, Unit 2	**TOPOC BUFF**		Bowl
9	Locus A, Unit 3	**TOPOC BUFF**		Jar
18(&20)	Locus A, Unit 4	**SALTON BROWN**	(Base sherd)	Jar
47	Locus B, Unit 17	**TOPOC BUFF**	Direct	Bowl
48	Locus B, Unit 18	**SALTON BROWN**	(Base sherd)	Bowl
67	Locus B, Unit 21	**TUMCO BUFF?**		Jar
68	Locus B, Unit 22	**TUMCO BUFF**		Jar
69	Locus B, Unit 23	**TUMCO BUFF**	Recurved	Jar
87A1	Locus C, Unit 12A	**SALTON BROWN**	Direct	Bowl
96A	Locus C, Unit 14	**SALTON BROWN**		Jar?
97	Locus C, Unit 14	**TOPOC BUFF**		Jar
106	Locus C, Unit 16	**SALTON BROWN**	Recurved	Jar
115	Locus C, Surface	**SALTON BROWN**		Jar?
117	Locus C, Surface	**SALTON BROWN**		Bowl?
119	Locus C , Unit 25	**SALTON BROWN**		Bowl
121	Locus C, Unit 25	**SALTON BROWN**		Jar
131A	Locus C, Unit 27	**SALTON BROWN**	Recurved	Jar
137	Locus C, Unit 28	**SALTON BROWN**		Jar
230	Locus C, Unit 24E	**SALTON BROWN**		Jar
Type Assignment Based on Macroscopic and 40X Binocular Microscopic Analysis by Schaefer				
2	Locus A, Unit 1	**TOPOC BUFF**		Bowl
26	Locus A, Unit 8	**TUMCO BUFF**		?
71	Locus C, Unit 11	**Indeterminate**	Direct	Bowl
73	Locus C, Unit 11	**Indeterminate**		Small Bowl
87B1	Locus C, Unit 12A	**TOPOC BUFF?**		Bowl
171	Locus C, Unit 24A	**SALTON BROWN**		Jar
173	Locus C, Unit 24A	**SALTON BROWN**		Jar
186	Locus C, Unit 24B	**SALTON BROWN**		Jar?
187	Locus C, Unit 24B	**SALTON BROWN**		Jar?
Types Assigned by Author Based on Inferences from Schaefer's Appendix D2 (see App. D1)				
2-7	Locus A, Unit 1	**TOPOC BUFF**	Same vessel as #1	Bowl
138	Locus C, Unit 28	**SALTON BROWN**		Bowl
169	Locus C, Unit 24A	**SALTON BROWN**		Jar?
170	Locus C, Unit 24A	**SALTON BROWN**		Bowl?
172	Locus C, Unit 24A	**SALTON BROWN**		Jar
185	Locus C, Unit 24B	**SALTON BROWN**		Jar
229	Locus C, Unit 24E	**SALTON BROWN**		Jar
Note: Many sherds from Units 24A&B may be from the same vessel				

Cat #	Locus and Unit Provenience	Ceramic Type	Rim Form	Vessel Form
Rim Forms with No Type Assignment				
14	Locus A, Unit 14		Direct	Bowl
87A2	Locus C, Unit 12A		Direct	Bowl
90	Locus C, Unit 12B		Direct	Bowl
92B	Locus C, Unit 13		Direct	Bowl
136	Locus C, Unit 28		Recurved	Jar
138	Locus C, Unit 28		Direct	Bowl
288	Locus C, Unit 30		Direct	Bowl

For the discussion of the ceramic types identified via thin section in this study, Schaefer is extensively quoted below (see Schaefer in Appendix D2:3-5)

Topoc Buff (Schaefer, Appendix D2:3-4)

Topoc Buff is attributed to the Patayan II phase (A.D. 1000-1400) although it likely extends in time to the Patayan III phase. Direct rims with rounded lips occur on bowls although Waters (1982b) suggests that earlier vessels may also have direct rims. In the type description Topoc Buff is noted for the high percentage (30-50 percent) medium grained subangular to subrounded mineral temper or mineral inclusions, including white quartz, feldspar, black amphibole, and a few mica flakes seen adhering to other mineral grains. The greater diversity and angularity of mineral grains and grainy surface texture that results from grains protruding through the surface are what distinguish Topoc Buff sherds from Parker Buff or Colorado Beige, in addition to generally darker colors of Topoc Buff. Some vessel surfaces, however, can be better finished and less rough-textured. This type often tends to be browner in color, and when occurring as a gray, reduction fired ceramic, is indistinguishable from Pyramid Gray (Colton 1939; Waters 1982b). For that reason, any gray sherds of this fabric were classified as Topoc Buff . . . .

. . . . The five RIV-7834 thin-sectioned specimens clearly show the darker brown-gray color spectrum, evident both in hand specimens and the fabric color in thin section. Grains are clearly seen through the surface. Four of the specimens have high mineral density and poor sorting while only one (Cat. No. 47) displayed a medium density, as well as medium sorting. Grain size sorting is uniformly poor. Unlike the normative type description, grains are more often angular, but do display a diversity here to subrounded. This difference may be due to the fact that grain angularity can be more accurately defined in thin section and cut cross-section, than it can be by examination of hand-held specimens.

Like all of the ceramic types, quartz was by far the most common mineral type. Two thins sections showed noticeably strained quartz grains. Biotite mica was evident in one slide and muscovite occurred in two slides . . . one of which was only in trace amounts. Muscovite and biotite did not co-occur in the same slide. Muscovite flakes . . . were most usually seen affixed to quartz grains. Two Topoc

sherds contained trace amounts of amphibole . . . It should be noted that while black grains were observed in numerous thin sections and presumed to be amphibole, this mineral was not apparent in thin section. Three slides contained trace amounts . . . of unzoned plagioclase feldspar. . .

In terms of grain characteristics, these sherds closely resemble the Topoc Buff sherds from two Lake Cahuilla high stand sites near Dos Palmas (RIV-6953 and RIV-7112) (Schaefer et al. 2013). The Lake Cahuilla sherds, however, contain microcline or orthoclase feldspar in substantially greater amounts and both biotite and muscovite. Clearly the tempering materials come from different sources.

Author's Comment. Could I have more clarification about how to classify/distinguish reduced Topoc Buff from Pyramid Gray? After a brief discussion of Colton's (1958) updated description of Topoc Buff, Schaefer answered as follows:

> . . . . I am going with Water's [1982b] statement that Topoc Buff and Pyramid Gray are indistinguishable and quoting Rogers [1936] that the types should be combined until better temporal or spatial discriminations can be made. Waters also says that Colton's description of Topoc is not the same as his and Rogers and that what he describes as Topoc has all the characteristics of Pyramid Gray except that it is oxidized. You can see from some of the figures [see Appendix D2:7-9] that some of the Topoc has part reduced and part oxidized sections as well. So what to do with the completely well reduced gray sherds. Definitely, reduction-fired pottery occurs more often in the Coachella Valley than some other areas of the Colorado Desert but still not as much as in the eastern Mojave, I think. I am therefore reluctant to use Pyramid Gray as a type here without knowing there is a deliberate and pervasive reduction firing tradition. Topoc Buff is a better and inclusive type for this region and time period. Both Colton and Waters lacked enough datable material and geographically wide samples to be definitive either way . . . (J. Schaefer, personal communication, 05/05/2015)

<u>Tumco Buff (Schaefer in Appendix D2:4)</u>

Tumco Buff is a Patayan II phase (A.D. 1000-1500) ceramic type although examples extend into the Patayan III phase with the final infilling of Lake Cahuilla (A.D. 1600-1700) and the historic period. It is likely a refinement of Black Mesa Buff with the same profusion of clay chunks or crushed sherds and a few mineral grains. Rim sherds are easy to distinguish by their recurved profiles while Black Mesa Buff sherds only have direct rims. Tumco Buff sherds do tend to be thinner and more evenly finished, with a harder fracture, and no surface crackling. It should be noted that some error may occur when distinguishing Tumco Buff from Black Mesa Buff if rims are not found. With this assemblage, a large diameter bowl sherd, Cat. No. 69, exhibits a pronounced recurved rim and relatively thin

wall thickness that is characteristic of Tumco Buff. Tumco Buff cooking pots are frequently stuccoed with sandy clay to compensate for the lack of minerals in the fabric, a potential weakness when exposed to thermal shock. No stuccoing however, was noted for this assemblage.

The three Tumco Buff thin sections (Cat. No. 67, 68 and 69) have the characteristic blocky fabric of clay chunks with mineral grains just barely visible in freshly broken hand specimens and cut section. Only in thin section under a microscope do the rounded-subrounded mineral grains become apparent. Quartz grains are the most common in Cat. No. 67 . . . initially suggesting that this sherd should be left in an indeterminate category. Quartz is only a trace in Cat. No. 68, and more common and with larger strained quartz grains in Cat. No. 69. No other minerals were observed in Cat. No. 69 but traces of plagioclase feldspar and muscovite mica were seen under very high magnification in Cat. No. 68. Both macroscopic and microscopic differences between the three sherds indicate they derive from different vessels and different clays. This divergence from the normative type description of Tumco Buff, [mineral] grains should be absent or minimal, reflects the problem of applying the Rogers/Waters Patayan ceramic typology. These sherds might be otherwise classified as a Tumco subtype or variant form where both crushed sherds and mineral grains are present. Malcolm Rogers (1936:30-31) observed just such a practice among Quechan potters where upper terrace clays, more likely to contain mineral grains, are tempered with crushed sherds collected from other sites.

Author's comment: What about the presence of stucco-like material near the rim on Cat. No. 69? Schaefer responded as follows:

> There would be appear to be some residual clay over the finishing surfaces along the rim and on the neck but not a well applied coating of clay over the finished surface, then fired on. Usually you find that on the base and sides where thermal shock would be greatest in a cooking pot and stucco is applied to counteract that. Stucco des get misplaced on the upper portions sometimes but without more of the base, I am reluctant to call this sherd stuccoed (J. Schaefer, personal communication, 05/05/15).

Interestingly enough Van Camp (1979:50) notes that stuccoing is used primarily for cooking vessels to resist thermal shock. The stucco, "a thick, sticky layer of slip, or engobe, sometimes including coarsely ground potsherd material, is applied over . . . the lower two-thirds or three-quarters of the vessel . . . Near the top of the vessel the added layer was very thin, but on bottom was sometimes as much as six millimeters thick"(Van Camp 1979:50).

Again quoting Schaefer from Appendix D2:4:

It is also interesting that all three Tumco Buff sherds are from Locus B. There is one sherd that definitely appears to have crushed sherds in Locus A (see Cat.

No. 26 from the surface of Unit 8, and there might be one sherd with grog in Locus C (see Cat. No. 132 found at a depth of 13 cm in Unit 27). The sample size is too small but three out of four Tumco Buff sherds are from the surface of Units 21-23 in Locus B which are relatively widely spaced so are unlikely to be from the same vessel. Perhaps Locus B represents a different time period and/or a cultural group with contacts than Loci A, C and D.

Salton Brown Ware (see Schaefer in Appendix D2:4-5)

This ceramic type is associated with the western shoreline of Lake Cahuilla, derived from Brawley formation clays, as determined from chemical and petrographic analysis (Hildebrand et al. 2002) although this type may be produced from other Tertiary and Quaternary clay sources near the project area. The brown color and high mineral content are indicative in this case of a sedimentary clay in which there has been substantial alluvial contribution of minerals from a upland geological zone, either naturally or as a deliberate tempering agent. Examination of Brawley formation clays suggest the mineral constituents are naturally occurring. The fact that Salton Brown appears to be the predominant type in the RIV-7834 assemblage would suggest it is locally produced. As defined, it has a distinct dark brown to brick red color with abundant mineral grains that show through the surface. It contain contains abundant angular to subangular/subrounded quartz and feldspar grains with only occasional flakes of mica. Typically, amphibole is absent or very rare, in comparison with Tizon Brown Ware from the Peninsular Ranges.

All of the 12 brown war sherds were classified as Salton Brown, meeting the above characteristics with a high degree of consistency. Grain density was usually very high with poor sorting by grain size. Grain shape varied from angular/subangular to subangular/subrounded. Grains were more often angular than any other shape. Quartz was the most abundant mineral constituent (it often is in any ceramic fabric) with three specimens exhibited a higher amounted of strained quartz grains. Plagioclase feldspar occurred in trace amounts in four thin sections, and in counts greater than only one or two grains in six thin sections. Only four thin sections had no observable feldspar. One sherd (Cat. No. 119) had a trace of microcline (orthoclase feldspar) and stands out from the other Salton Brown thin sections as a result. Mica flakes were common in almost every slide except for two where it occurred in trace amounts and only one where it was not observed at all (Cat. No.119). Muscovite mica was the most readily apparent, often clinging to quartz grains . . . Biotite mica was seen in seven specimens, usually very small grains within the fabric. Biotite and muscovite usually don't co-occur in Colorado Desert thin sections but they do in seven of these. Some thin sections were so similar as to suggest they derive from the same vessel or production from the same clay source. This is especially true of the thin sections that have both biotite and muscovite mica (Cat. Nos. 48, 115, 117, 121, 131, 137, and 230). [End of quote from Schaefer in Appendix D2:4-5.]

Based on Schaefer's discussion above, it is interesting to note that Salton Brown is best known from the western shoreline of Lake Cahuilla. RIV-7834 is not a highstand shoreline site but it is located near the eastern shoreline of Lake Cahuilla. An interesting question is whether its presence at this site suggests it was important near the eastern highstand shoreline and/or whether it spread toward this shoreline during lake recessional periods.

Final Interpretations and Conclusions (Schaefer in Appendix D2:5)

Buff ware sherds with the petrographic signature of Topoc Buff and brown ware sherds with the attributes of Salton Brown appear to be the most common in the assemblage. These types are indeed predominant at Cahuilla sites like RIV-45 in Tahquitz Canyon (Schaefer 1995) where the majority of assemblage postdates A.D. 1700 and the final recession of Lake Cahuilla. As such, it may be suggested that they are locally produced Cahuilla products. At Lake Cahuilla high stand sites that predate A.D. 1700, these types occur at lower frequencies, such as at RIV-6953 and RIV-7112 near Dos Palmas where a longer and earlier period of occupation is indicated by radiocarbon dates. There, ceramics normally associated with the Lower Colorado River predominate, suggesting considerable movement between Lake Cahuilla and the Colorado River. The Tumco Buff sherds, however, are more likely products of the Lower Colorado River. Tumco Buff on West Mesa, along the southwestern shoreline of Lake Cahuilla, differ from those at RIV-7834 in that they contain none or very little mineral inclusions (Schaefer 1986, 1988). A mix of crushed sherd and mineral inclusions are more often found at sites close to the Yuma and other areas along the lower Colorado River, and perhaps can be identified as a Tumco Buff variant or even a separate type with some geographical specificity (Schaefer 1994a). I would therefore conclude that the Tumco Buff sherds in this collection do indeed represent cultural contacts between the people of RIV-7834 and the Lower Colorado River.

A cursory comparison of clay and mineral sources that underwent petrographic analysis from Orocopia Wash, the Whitewater River near Palm Springs, and the Santa Rosa Mountains found no good matches. All of these contained much greater variability of mineral types than what was found at RIV-7834. More likely, some locally derived clay or clays near RIV-7834 were used. These would be clays with a noticeable lack or paucity of microcline/orthoclase feldspar and amphibole as key markers (Schaefer in Appendix D2:5)..

Other Artifacts

Other artifacts include a fish vertebra that may not be cultural from the 0-20 cm level of Unit 3; a vehicle washer from the 0-20 cm level of Unit 4; and a small piece of burnt animal bone from the North Wall of Unit 24B found in a charcoal sample taken from 14-34 cm. Little else can be said about these artifacts.

Radiocarbon Dates

Three charcoal-based radiocarbon dates were obtained from Locus C of RIV-7834. These dates are summarized in Table 9 below::

Table 9: Radiocarbon Dated Features from RIV-7834, Locus C

Beta No.	Provenience and Catalog No.	Conventional C14 Age	C13/C12	Calibrated Age, 2 sigma
403031	**Unit 25, 28-30 cm; near Hearth Rock #3;** Cat. No. 124	610 ± 30 BP	-26.8 o/oo	**Cal AD 1290 to 1410** (Cal BP 660 to 540)
403032	**Unit 24, 16-20 cm; north wall, Hearth #1**; Cat. No. 157B	620 ± 30 BP	-25.7 o/oo	**Cal AD 1290 to 1405** (Cal BP 660 to 545)
403033	**Unit 24A, 15-20 cm; north wall, oxidized layer (Level IIA);** Cat. No. 165	510 ± 30 BP	-17.5 o/oo	**Cal AD 1400 to 1440** (Cal BP 550 to 510)

These indicate that Hearth #1 in the Unit 24 complex and the hearth in Unit 25, five m to the west, are essentially of the same time period, Cal AD 1290 to 1405/10. The oxidized layer with charcoal spots dates a bit later, from Cal AD 1400 to 1440, though there is a slight chance the dates are all from the same period of AD 1400-1405.

Probable Site Occupation Period(s) and Site Function

Site Occupation and Lake Cahuilla chronologies

Placing the radiocarbon dates ranges within the Lake Cahuilla chronologies depends upon whether you use Waters (1983) or Philibosian (2011) [see Section 3.3.1 and Figures 13&14) above]. Figure 35 below reproduces Figure 13 on the next page. If Waters (1983) is used (see Figure 35), it shows a wet period between about A.D. 1200 to 1400, whereas Philibosian (2011) shows a dry period from AD 1200 to about 1390. While there is a narrow window where they agree, Water's (1983) chronology is based on too few sites and too many freshwater shell dates which Philibosian has shown can be 400-800 yrs too old (Philibosian 2011:27,34; see pp. 43-44 above). If we go with Philibosian, then it is likely that Locus C of RIV-7834, which is situated at -40 ft. (-12m) elevation represents a recessional site and/or perhaps it was associated with a partial infilling of Lake Cahuilla that was missed in the Philibosian central trench sample which was at an elevation of the 9 m (Philibosian 2011:34). The oxidized layer with charcoal spots, however, would clearly date to after the beginning of Philibosian's second "wet period" highstand that begins ca. 1390. The hearths are more likely to date prior to this "wet period," unless their actual date lies at the very end of the C14 dating range, i.e., ca. 1390/1405. However, it takes ca.

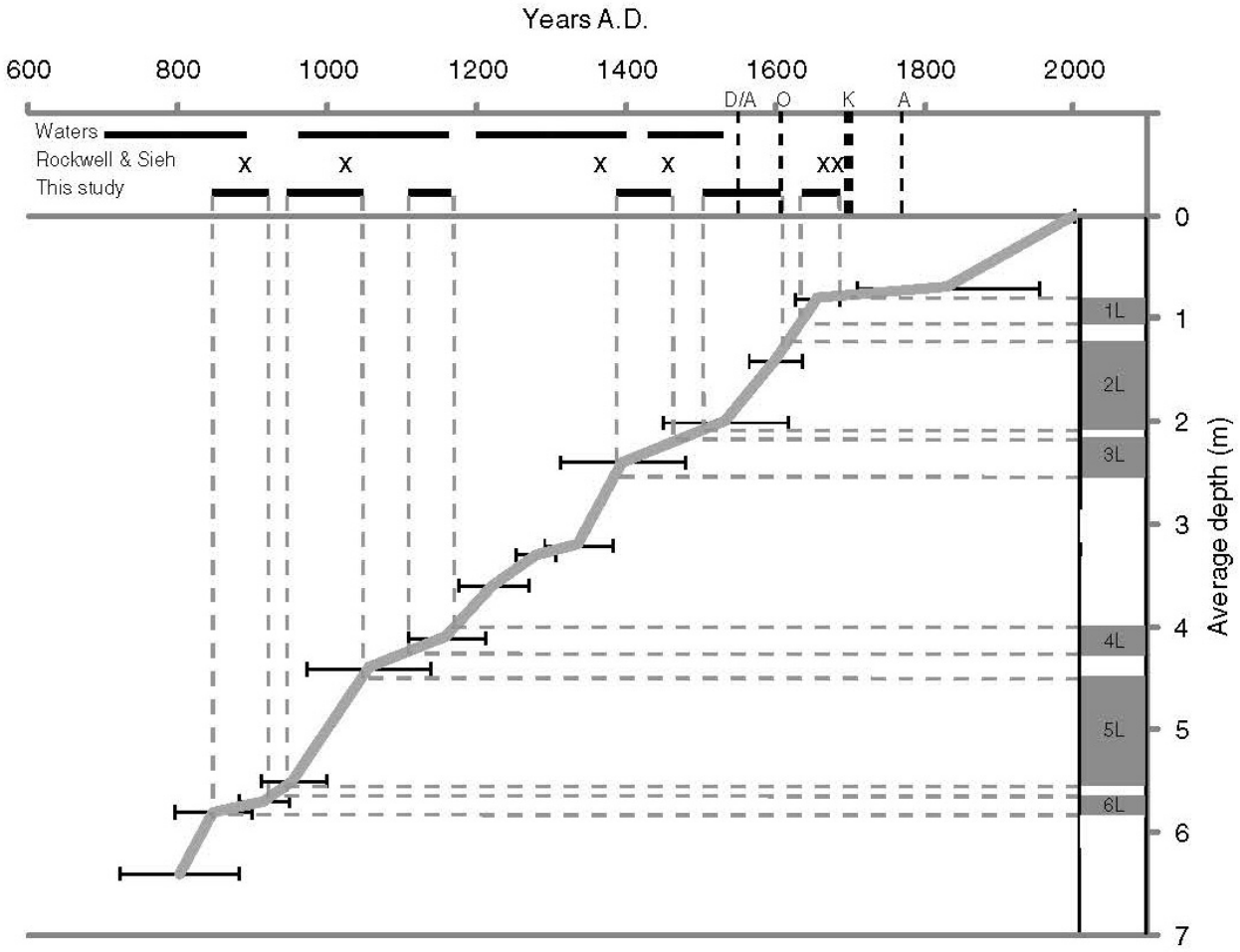


Figure 35: Comparison of Philibosian et al.'s (2011) lake highstand chronology based on trenches in Coachella with those of Waters (1983) and Rockwell and Sieh (1994). The Coachella-based study shows six distinct highstands grouped into "most wet" periods. The subdivision intervals between the mostly wet periods was probably insufficient for the lake to have completely desiccated, but may have shrunk to the size of the Salton Sea (Philibosian et al. 2011:34 and Figure 18).

10-20 years for the lake to fill which would mean that the "wet period" actually began ca. 1370-1390., which could indicate the hearths were briefly used during a period of rising lake waters. The imprecision of the C14 dates makes it difficult to say.

An earlier article by Laylander (1995:Figure 1) which illustrates the relative chronologies of 40 ft. (12 m) highstand shoreline sites compared to recessional shoreline sites would place the RIV-7834 Locus C hearths during a recessional period with the oxidized layer lying in a transitional zone between the two (see Figure 36 which reproduced Laylander's (1995) Figure 1).

Site Stratigraphy, Lake Infillings, and Site Chronology

The vast majority of the sherds recovered from RIV-7834 are from the surface, except at Locus C. However, even at Locus C, many of the subsurface sherds may belong to vessels that are also on the surface, especially in Units 11 and 12A&B. In Locus C, the hearths found within the Level II unconsolidated sandy gravels are covered by Level I (sandy silt) that essentially seals the hearths. It is likely that the surface and near-surface ceramics represent an occupation after the last major infilling of the lake reaching a highstand shoreline in the late 17th century (see Philibosian 2011:34-35; see also Laylander 1995, 2007). However, the numerous Salton Brown sherds found entirely within the Level II unconsolidated gravels within the Unit 24 complex suggest that they may date to the hearth use period which is much earlier, during some time during the 14th-very early 15th centuries. The oxidized zone may represent the reworking of a burn area by natural processes (rising lake levels?) in the early to mid- 15th centuries. Later, the site was reused in the 1700s or 1800s by those seeking to collect various seeds and plant parts of economic value, occasionally leaving behind broken pots and bowls that were dropped.

Philibosian (2011:34:Figure 18) suggests that the second "wet period" between ca. 1290 and 1680/90 never saw a completely dry lake. There is no actual evidence of camping or residential occupation of RIV-7834 other than the hearths. However, these hearths contain no charred plant food remains and no evidence of burnt animal bones (though there is a minute fragment in the reworked oxidized zone deposits). In fact, RIV-7834 as a whole is essentially a ceramic scatter with no lithic artifacts and virtually no other artifacts, just the hearth features. This means that RIV-7834 could have been visited at any time during a rising or falling lake level during the "wet period" and is not actually a "shoreline site." In fact, the hearths may have been used only during the daytime!

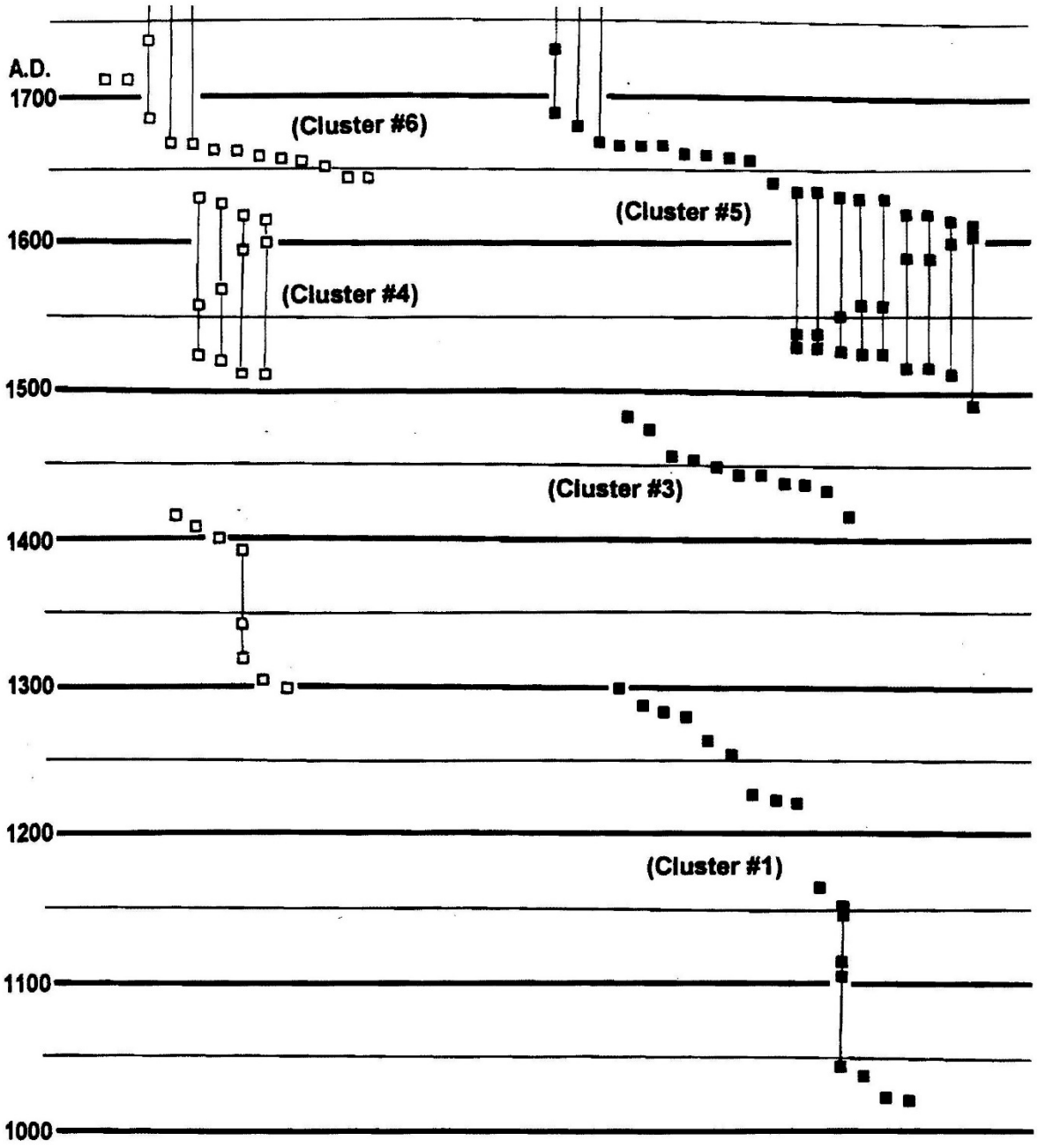


Figure 36: Clusters of C14 dates associated with Lake Cahuilla shorelines. The solid squares represent dates associated with the 40 ft. (12 m) highstand shoreline; open squares represent dates associated with lower, presumably recessional shorelines. The vertical lines connect multiple calibrations for single C14 dates [after Laylander 1995:Figure 1]. The two RIV-7834 Locus C hearth dates roughly match the 14th-early 15th c. recessional cluster. The oxidized zone date falls within the end of the 14th century recessional cluster and the beginning of the 15th c. highstand shoreline cluster labeled "Cluster #3".

The Locus C Hearths: Sporadic Day Camping vs. Ceramic Firing Pits

Given the lack of evidence for a residential site or even overnight camping at RIV-7834, what function did the hearths serve? If no camping with food consumption took place at the site, then what other function could they have possibly served?

Hypothesis: the hearths in the Unit 24 complex in Locus C might have been used for firing ceramic pots in shallow open pits.

Discussion: Little ethnographic data are available concerning traditional ceramic firing techniques among the Cahuilla prior to the disappearance of such practices in the early 20th century (Rogers 1936:26). The crafty has been revived but has been influenced by other traditional group practices. Here is a summary of some pertinent information regarding the size, depth, and construction of ceramic firing pits, the fuel used, the firing process, and other associated practices taken from the ethnographic literature of a number of southern California groups.

Firing Pit Size, Depth and Construction: There is not a great of information on this other than various ethnographic pictures among the Kumeyaay and the Paipai as well as the Desert Cahuilla.

- Rogers (1936:14, 48), speaking about the stages of Yuman pottery making:

> For firing a group of eight pieces . . . Rosa Lopez [Owas Hilmawa from Manzanita Indian Reservation; see Campbell 1999:119] dug a pit fourteen inches [35 cm] deep and two feet [61 cm] in diameter (pl. 5 b). She lined the bottom of the pit with small stones averaging four inches in diameter and spaced them so that small twigs, used in starting the fire, could be packed in between them (Rogers 1936:14; 48 for plate 5 b).

- Quinn and Burton (2009:286-287) note that "ethnographic studies of traditional ceramic production in southern California document the use of a simple firing pit (Rogers 1936:14; Cline 1984:38; Hohenthal 2001:171)
- Other pictures in Campbell among the Kumeyaay and Paipai potters of Santa Catarina in Baja California suggest that pits are sometimes larger and deeper (Campbell 1999:122, 132-133).
- According to Shipek (1951:10), as cited in Van Camp (1979:53), "in some cases the vessels were fired directly upon the ground."
- Pottery drying (to remove absorbed water) was done in shallow drying pits (Campbell 1999:133) or directly on the ground (Rogers 1936:13).
- However, according to Rogers (1936:28), Schumacher 1876-1879) describes a type of pit-kiln which is unique, a covered kiln. While firing, vessels were put on a "bed of potsherds and covered with hot wood ashes"; the pit was then covered over with green poles thatched with grass and bark and a layer of dirt under which the pottery would bake for several days.

Fuels for Firing Pottery: Various kinds of fuel were used to fire pottery, and while a mixture or range of fuels might be used, there was often a preference for a certain type of fuel if it was available (Rogers 14, 25; Van Camp 1979:53).

- Rogers (1936:14) states that for the Southern Diegueño, dry oak bark used since prehistoric times was still the preferred fuel for best results.
- Campbell (1999:134), citing Ken Hedges and his study of the Northern Diegueño at Santa Ysabel, preferred coast live oak, but other species could also be used.
- Rogers (1936:25) also notes that the Kamia in their arid environment preferred the dead roots of saltbush.
- Van Camp (1979:53) also emphasizes the importance of oak bark because of its long lasting hot fire, but where not available, the branches and leaves of yucca, saltbush or mesquite could also be used; the latter producing a very hot fire that burns rapidly.
- Ethnographic evidence shows that mesquite, sage, saltbush, and creosote were all used for fuel for cooking and camp fires (see Jaqua in Appendix C).

Elements of the Firing Process

- Quinn and Burton (2009:287) note that "direct evidence for prehistoric firing technology is almost entirely absent and notes that may have often been fired away from habitation or other activity areas."
- Rogers (1936:5) makes the following interesting observations about the firing process:

> Work was started early in the morning and continued until dark without cessation for eating; if it was essential, work was sometimes continued after sundown, by firelight. A potter generally walked away from the village in seclusion, either in the shade of a tree, a boulder pile, or beneath a ramada of boughs. No one was permitted to observe her work; to do so would bring bad luck and failure. Even the firing was conducted in private; the cracking of a batch of pottery in the kiln of Rosa Lopez was attributed to my having watched the procedure (Rogers 1936:5).

- Later he adds (Rogers (1936:14) that "it is considered bad luck to watch or even go near the kiln until the fire is out. Then, too, walking about might jar the ground sufficiently to cause some of the vessels to fall."
- Rogers (1936:14) that for pottery firing "potters attempt to find the driest site possible, so that the fire will not generate steam," and he continues: "Kilns are cleaned out and re-sued as long as it is feasible."

Given the above ethnographic information, let us now look at the evidence for and one or both hearths in the Unit 24 complex as being ceramic firing pits.

Evidence for Ceramic Firing Pits. Given the above, and recognizing the potential weakness of cross-ethnographic analogy, what evidence is available to support the hypothesis of ceramic firing pits at Locus C of RIV-7834?

- For the Unit 24 complex, Hearth #1 measures nearly 1.5 x 1.2 m and Hearth #2 is about 1.1 x 0.8 m, both of which could have accommodated a significant number of vessels for firing. The pit made by Rosa Lopez described above was 61 cm in diameter.
- The depth of Hearths #1 and 2 range between <10 cm up to about 20 cm; this is shallower than many ethnographic descriptions, but Shipek (1951) noted that sometimes the firing was done on the ground.
- Most of the stones in Hearths' 1 and 2 are small stones, with a large number less than 4 inches (10 cm) in length.
- Hearth #1 shows evidence of having been reused multiple times, which fits Rogers (1936:14) observation that ceramic firing pits are used and reused as long as possible.
- Subsurface ceramics in all of Locus C are most abundant and deepest within Units 24 A&B associated with Hearth #1.
- The sherds in Units 24A&B are virtually all Salton Brown and many of them are similar enough to represent a pot that was poorly fired, especially given the soft to very soft, crumbly paste of Cat. Nos. 182 and 196 (see Appendix D1).
- There are no recorded habitation sites within at least several hundred meters of the site which fits with the idea of a secluded area for firing to ensure a successful firing.
- Saltbush, mesquite, creosote and sage are present in the hearths, all of which have been used for firing ceramics by various groups. Hearth #1 contains multiple wood types but low in mesquite; it was also reused many times and the different wood types may represent different firing events. The wood fuel in Hearth #2 is mostly focused on mesquite with some creosote and sage. It is less clear that it was reused frequently.
- Given the absence of either floral or faunal food remains or lithics of any kind, RIV-7834 shows little sign of being either a seasonal habitation or overnight camp site. The lack of food remains also fits well with Roger's (1936:5) of working all day and getting the work done without eating.
- The hearths were all placed within unconsolidated sandy gravel that might have helped amplify the heat during ceramic firing.

Evidence against Ceramic Firing Pits. On the other hand, what is the evidence against such a hypothesis?

- Both hearths are relatively shallow (10-20 cm). Given that only a portion of the Unit 25 hearth was excavated, it's full size and contents are unknown, though there was no evidence for food remains.
- There is not much evidence for ceramic wasters often found in open pit firing areas, e.g., warped sherds or evidence for multiple broken pots.
- Multiple species of wood were used for fuel, especially in Hearth #1. The

choice of wood fuels does not appear to be very selective, whereas ethnographic evidence suggests the use of preferred woods most suitable for ceramic pot firing whenever possible.

- The re-use of Hearth #1 could support a simple camp fire reused by a group that revisited the site often, but the relative lack of large stones tends to argue against this.
- Hearth #2 produced no associated ceramics as possible wasters.
- A fire could have been produced for warmth if the site was visited during some of the cold, relatively windy days, during the winter time when desert sites were most commonly used for harvesting many plant resources.
- The placement of the hearths in unconsolidated gravel would have also amplified the heat of a camp fire for warmth.

In short, while the hypothesis that Unit 24 complex hearths were used for firing pottery is plausible, there is not enough evidence to be certain of this. It is curious, however, that no food remains were recovered at any of the hearths.

Conclusions Regarding Site Function and Occupation Period(s)

The Phase I report (de Barros 2014) recommended that test excavations be conducted at this site. As discussed in Section 4.2 above, the test excavations revealed considerably more about the site in terms of the depth and presence of subsurface deposits, the nature of its ceramics, and the presence and nature of three charcoal-rich hearth features. It also determined that are no human remains at RIV-7834 and that only one small burnt animal bone and no flaked or ground stone tools or waste flakes are present. While an analysis of the charcoals revealed the nature of the types of wood fuel used, no food remains were recovered. In short, the site consists almost entirely of ceramics and hearths with charcoal and FAR. The ceramics represent bowls and jars that were dropped and broken during the procurement of plant food resources at all four loci (A-D), probably during the 17th or 18th century after the last infilling of Lake Cahuilla. This statement is based on the fact that the hearths are in an unconsolidated gravel later sealed under between 5-15 or more cm of friable sandy silt. The hearths represent either daytime camp fires for warmth on cold winter days and/or ceramic firing pits used to produce pottery during the 14th and/or very early 15th centuries. In addition, there is a non-cultural oxidized zone with charcoal spots in Locus C that appears to represent the reworking of a burn area by unknown natural processes during the first half of the 15th century.

4.3 RIV-7835: PROBABLE SEASONAL CAMP SITE

4.3.1 Updated 2005 Survey and Test Excavation Results

The data available in the 2005 site form and the Dice and Messick (2005) test report are not consistent. The site form has been updated to sort out these inconsistencies, using the 2014 field mapping data as well as the Unit Level Records in Dice and Messick (2005:Appendix C). The new site form is available in the Confidential Site Records Appendix to this report. The description provided below is taken from the updated site form. The 2005 survey was conducted in late February and the testing from May 25 through June 7, 2005.

Originally recorded and tested in 2005, this surface ceramic scatter may represent a seasonally occupied camp site along an old shoreline. It measures 50 m (NS) by 34 m (EW) and is situated at an elevation of -53 feet in an area of saltbush scrub. It is about 1.65 km northeast of the Whitewater River.

Surface artifacts included up to 47 sherds of which 32 were collected and classified. They include 29 Salton Buff (24 body sherds, 4 direct rim sherds, and 1 recurved rim sherd), along with one Salton Brown, one Colorado Beige, and one unidentified rim sherd. Other surface artifacts include a hammer/chopper and a brown bottle glass shard (Dice & Messick 2005:27-29). [The site form originally identified all sherds as Tizon Brownware.] The 2014 resurvey found 19 surface sherds including two that extend site boundaries to the south (Figure 37).

A total of 18 test units were excavated to at least 40 cm in 20 cm levels, and they went deeper if artifacts continued to be found (Dice and Messick 2005:29). The Unit Level Records in Appendix C of Dice and Messick (2005) show that excavation ceased at 40 cm in Test Units 2, 6, 9-11, 14-16, and 18; at 60 cm in Units 1, 7-8 and 17; at 80 cm in Units 5 and 12-13; and, finally at 100 and 120 cm, respectively, for Units 3 and 4. Sherds were found primarily in the upper 40-60 cm with some between 60-80 cm and 100-120 cm in Unit 4. All of the other artifacts were found in the upper 40-60 cm. Deep charcoal staining suggestive of a hearth clean-out was encountered in the 60-80 cm level of Test Unit 4 and charcoal bits were encountered in the 40-60 cm level in both Units 4 and 5.

The 2005 site form indicates that the upper 20-30 cm of the site have been disturbed by previous agricultural activities between 1953 and 1984 and that creosote scrub may have once been present as well in the site area. It also notes that “soil horizons suggesting [sic] of lake bed sediments, linear charcoal staining, a possible chunk of adobe resting on the lakebed sediments were detected.” This issue is not discussed in the test report, but unedited soil profile sketches and the Unit Level Records suggest possible laminated lakebed sediments below the hearth cleanout in Unit 4, but not in association with the adobe chunk in Unit 17. However, charcoal bits, three fish vertebrae, and a piece of fire-altered rock were noted at about the same 30-cm level with the possible adobe fragment.

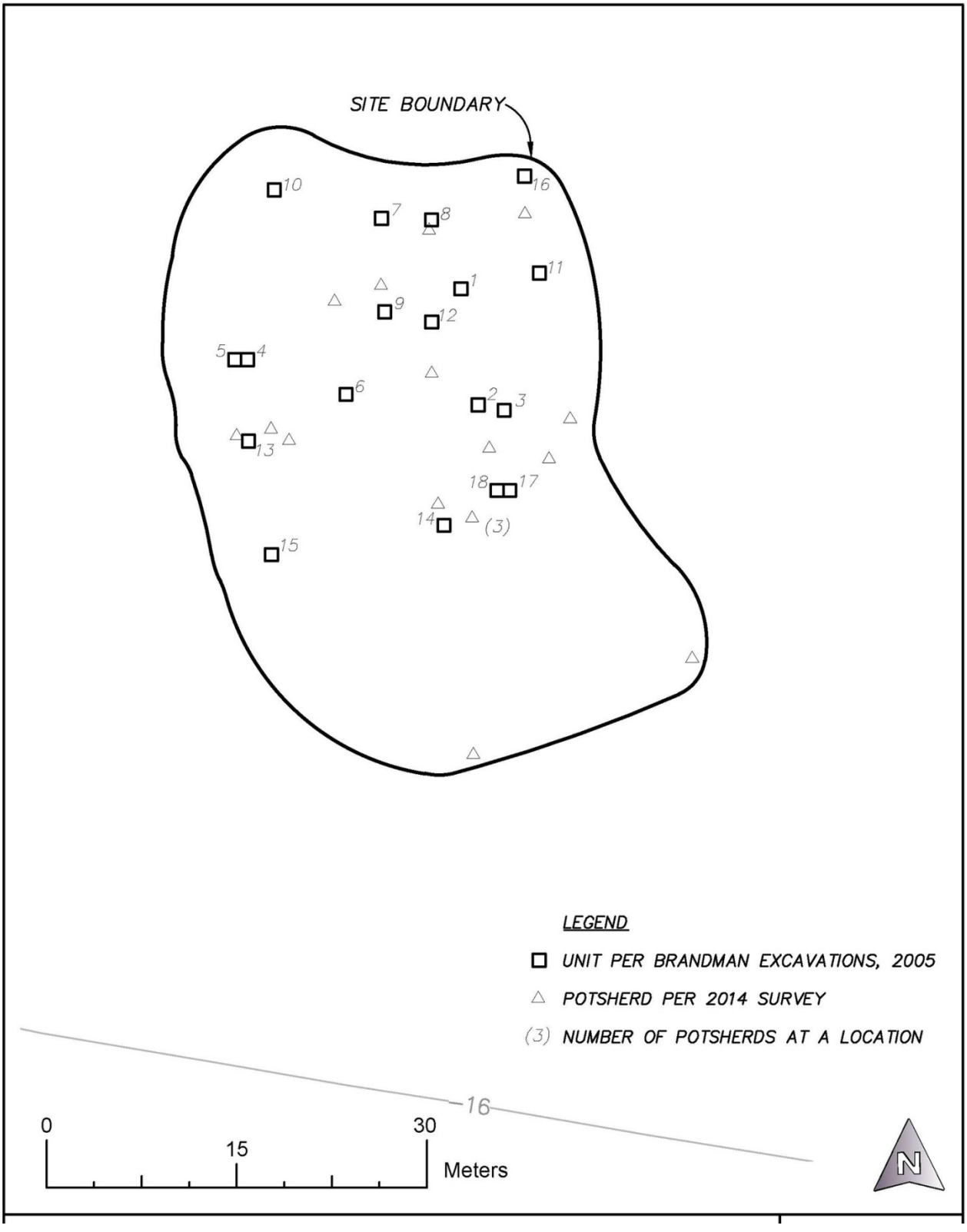


Figure 37: Revised Site Map of RIV-7835 based on 2014 Resurvey

Based on Water's (1982) Lowland Patayan ceramic chronology, the 2005 test excavations recovered 116 subsurface sherds, including 103 Salton Buff (97 body sherds, 5 direct rim sherds, and 1 recurved rim sherd), nine Salton Brown, three Colorado Beige, and one unidentified rim. In addition, a total of 74 "other items" are noted in Table 4 of Dice and Messick (2005:29-30), but descriptive details are only presented in a brief table in the 2005 site form.

Excluding ceramics, the following items are listed on the site form: 17 "stone flakes", three fire-altered rock, two groundstone fragments, four bottle glass fragments, 33 [sic] non-human bone, nine charcoal samples, four chunks of volcanic tuff, a possible adobe brick fragment, a porcelain fragment, and four shards of bottle glass. However, the Unit Level Records in Appendix C of Dice and Messick (2005) suggest these identifications may be partially incorrect. Many of the "17 stone flakes" are actually listed as "quartz fragments" or "schist flakes." There do appear to be at least seven flakes (two possibly utilized) made of quartz, chert or jasper, quartzite and basalt. In addition, a possible quartz crystal was recovered from the 20-40 cm level of Unit 17. Two or three pieces of fire altered rock and one or two possible groundstone tools may also be present. These include a "fragment of quartzite mano?" from the surface of Test Unit 2 and "a piece of granite" from Test Unit 4. Several items identified as "schist flakes" or "schist fragments" within several units could be from groundstone tool sharpening, but this is speculative. Three tufa fragments are noted from the 20-40 cm level of Unit 6 and a possible fourth from the 0-20 cm level of Unit 12. Aside from the three fish vertebrae found in Unit 17, only 3-4 other possible bone fragments were recovered, suggesting the "33 non-human bone" is a typo. In any event, the absence of a catalog in the test report makes it very difficult to be certain of what was actually found. On the site form, the artifacts are listed as being at the MBA office in Irvine, but there is no mention of the curation of artifacts from the test excavations in the test report.

4.3.2 Site Interpretation

The presence of surface and subsurface sherds and other artifact types in the deposit, along with possible features in Units 4 and 17, suggest the presence of a buried site that was once situated along a recession shoreline prior to the last one. As discussed above, the last one appears to have been in the 17th century though it is not clear if it attained the 12 m mark as previous infillings did. It could also be from an earlier infilling during the last 1700 or so years. The surface sherds could be a later use of the site but agricultural disturbance may have brought up sherds from deeper deposits.

During a discussion of Water's (1982) chronology of Lowland Patayan ceramics, Dice and Messick (2005: 22) note that Patayan I ceramics in the Lower Colorado region date to the period between A.D. 750-1050 and that this period is characterized by direct rims. Given that 11of 13 rims (mostly Salton Buff) were

direct rims at RIV-7835 they suggest the buried portion of the site may date to this early period.

4.3.3 2005 Site Significance Evaluation

After ruling out Criteria A-C, Dice and Messick (2005:30-32) found that the site is not a significant historical resource using Criterion D under Section 106 or CEQA, but did find it to be significant under CEQA's uniqueness criterion, presumably because of the dominance of direct rims which Waters (1982) indicates represent the Patayan I Period (AD 750-1050). Inexplicably, however, this reason is not provided in the evaluation section of the test report (Dice and Messick 2005:30-32), but it is stated on the Primary Record of the 2005 site form. In fact, after stating that site integrity was poor due to agricultural impacts, despite the fact these impacts are said to have only affected the upper 20-30 cm and that artifacts and features were found as deep as 80 cm, their CEQA evaluation states:

> Testing showed that the site does exhibit the potential for subsurface features of local significance, which would suggest the site is eligible under Criterion D. Although it is predicted that preservation of the site will likely be poor, the limited number of sites like this one in the area [presumably because of its purported Patayan I age, but this is not stated], plus the interest local tribes may have in significant local heritage interest [sic] suggests that the site should be considered a unique historic resource following CEQA guidelines. The collection of data during testing has not exhausted the data set that could be obtained from the site . . .
> (Dice and Messick 2005:32)

It short the site is found to be significant under CEQA's uniqueness criterion, presumably referring to the abundance of direct rims indicating Patayan I, AD 750-1050 AD. However, a study by Hildebrand (2003:258) for the North Baja Pipeline Project has demonstrated using dated, in situ stratified deposits containing Colorado Buff ware ceramics that one cannot assign ceramics to the Patayan I Period based solely on the presence of direct rims:

> These . . . data suggest that ceramic usage on the lower Colorado River was ongoing by perhaps A.D. 500. Early ceramic types on the lower Colorado River excavated during this project do not easily conform to the ceramic types described by Waters (1982) . . . . Based on 13 samples obtained from seven features, Colorado Beige ceramics span the time period A.D. 870 to 1645 with a mean of A.D. 1348. These data suggest that there was a longer time span (nearly 800 years) and later usage (Patayan II and III time periods) than expected for Colorado Beige ceramics along the lower Colorado River. In addition, the dated Colorado Beige rim sherds recovered were direct, rather than recurved, suggesting that direct rims are not diagnostic of early (Patayan I) time periods.
> (Hildebrand 2003:258).

A similar result was found for direct rims with Black Mesa Buff (Hildebrand 2003:258). In short, one cannot assert that direct rims equal Patayan I, thus removing a major argument for the site's uniqueness. However, one can still argue that the site is significant under Criterion D because of the presence of relatively intact subsurface cultural deposits to a depth of 80 cm, with two possible features, thereby demonstrating its potential to yield information important to the prehistory of the region, as the authors say in an earlier part of their evaluation section.

4.4 RIV-7836: SMALL PLANT RESOURCES PROCUREMENT SITE

4.4.1 Update of 2005 Survey and Test Excavation Results

The data available in the 2005 site form and the Dice and Messick (2005) test report are not consistent. The site form has been updated to sort out these inconsistencies, using the 2014 field mapping data. No Unit Level Records are provided for this site in Dice and Messick (2005:Appendix C). The updated site form is available in the Confidential Site Records Appendix to this report. The description provided below is taken from the updated site form. The 2005 survey was conducted in late February and the testing on May 16-17, 2005.

This site is relatively small, measuring 26 m (EW) by 15 m (NS) in size (see Figure 38). It was found within a relatively dense cluster of saltbush. Only nine surface sherds were recorded, with most concentrated at the eastern end of the site (Dice and Messick 2005:32). Only six of these sherds were collected, all body sherds. Five were identified as Salton Buff and one as Salton Brown (Dice and Messick 2005:Table 5, p. 33). Test excavations consisted of four units excavated to 50 cm using two 20-cm levels and a final 10-cm level. Eight sherds were recovered (including two from the surface). Of the six subsurface sherds, all but one was recovered from the 0-20 cm level. These sherds were identified as six Salton Buff (five body sherds and one recurved rim), one Salton Brown body sherd, and one unidentified body sherd (Dice and Messick 2005:Table 6, p. 33). In addition four glass shards were recovered between 0-50 cm, and one freshwater shell sample was taken from the surface of Test Unit 2. Only Test Unit 4 produced a sherd below the 20 cm level. No features were encountered. "Typically, the 20-40 cm level was composed of fine sand with shell fragment inclusions, but no laminated sediments or laminated shell deposits could be observed in any unit" (Dice and Messick 2005:33).

In short, based on the test report tables, a total of 14 sherds, a shell sample, and four glass shards were recovered from this site (Dice and Messick 2005:33). However, no site catalog is provided. Presumably the recovered artifacts are still at the MBA office in Irvine, but the site form is contradictory on this point. At one point, it says "the pottery has been placed back on-site at the modern ground surface level within the original site boundary," which is an unusual practice; however, later in the same site form it says the pottery is at the MBA office in Irvine, and "will be placed back on-site within the next month or so."

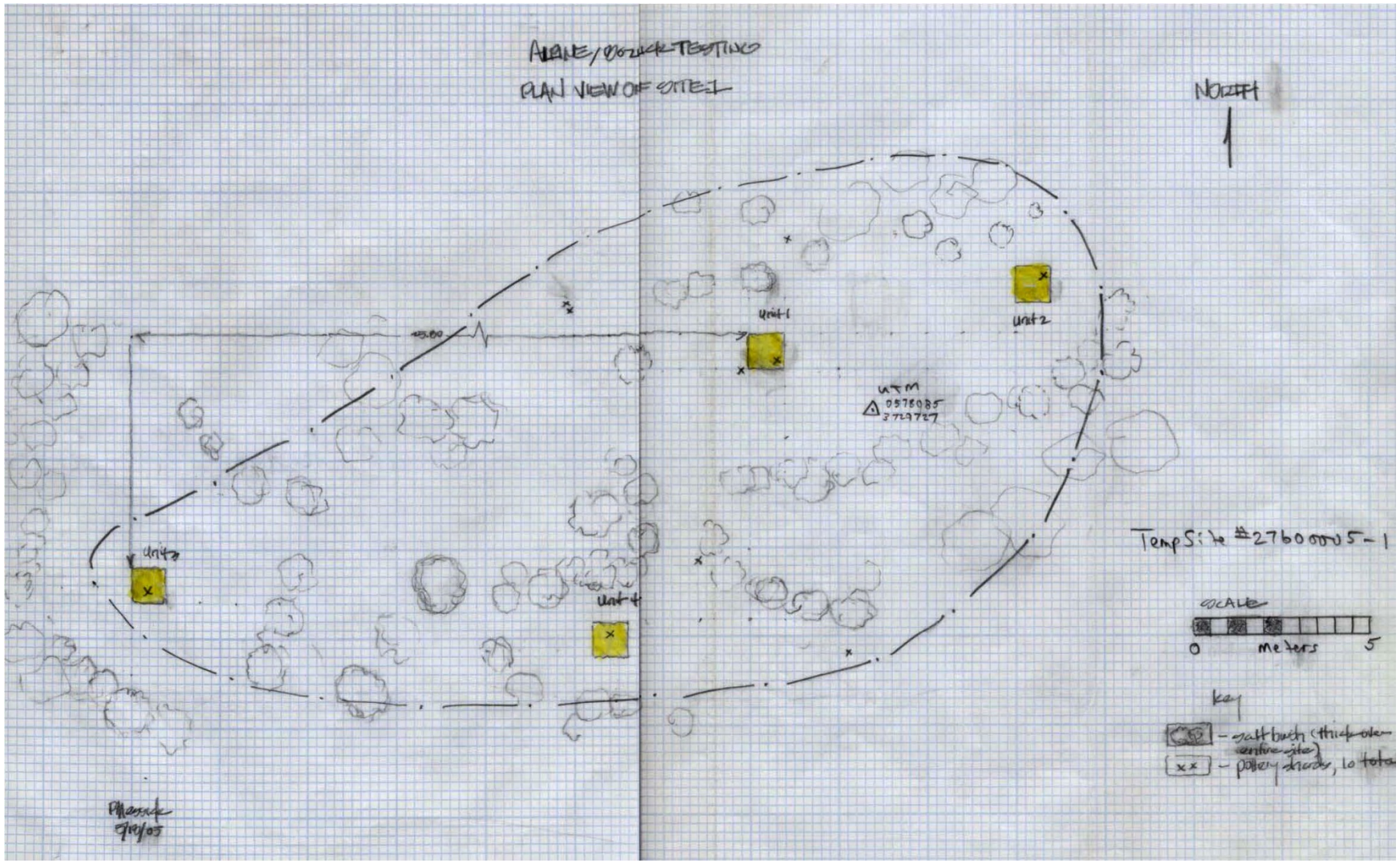


Figure 38: Test Excavation Sketch Map (Dice and Morrison 2005:34) showing Surface Sherds (Xs) and Test Units

The 2014 resurvey was unable to relocate this site, despite two attempts on different days. This is probably due to one or more of the following: 1) most of the surface pottery was collected during the test excavations; 2) the site was originally found within a relatively dense cluster of saltbush and thus had relatively poor visibility; and, 3) there was evidence of significant vegetation disturbance within the site vicinity that included some uprooted plants.

4.4.2 Site Interpretation

Given the lack of features and the paucity of artifacts and their relatively shallow depth, the site was interpreted as "a simple artifact scatter, possibly a potdrop" (Dice and Messick 2005:35). Presumably, this means several pot drops given that more than one vessel is represented in the recovered material.

4.4.3 2005 Site Significance Evaluation

This site was determined not to be a significant historical resource under Criteria A-D under both Section 106 and CEQA, nor under CEQA's uniqueness criterion.

4.5 RIV-11775: WATER CONTROL FEATURES ALONG AVENUE 47

This site consists of seven loci (A-G) containing between one and six currently used and/or abandoned water control features, including standpipes, water flow gauges, water pressure regulators, water flow valves, a reservoir, and other features linked by an underground water supply system constructed in the early 1950s by the Coachella Water District after the completion of Coachella Canal in 1949 (Figure 39A & B). Water is delivered to the highest point of every 40-acre parcel along section lines in areas of the water district eligible and registered to receive it. These are gravity flow pipelines. Other networks provide underground tile drainage systems to carry high-salinity, used drainage water to the Salton Sea [see CVWD (2014:1-4, 9-11) at http://www.cvwd.org/about/waterandcv.]

The loci and reservoir are all along the south side of 47th Avenue between Polk and Tyler Streets in the City of Coachella. Vegetation and/or current land use to the north consist of Sonoran creosote bush scrub with some saltbush scrub and former farmland areas; to the south, former farmlands and existing vineyards and saltbush scrub with some creosote scrub. Soils consist of fine sandy loam and fine to sands with pebbles and some cobbles. The site lies within the geologic sink known as the Salton Trough that once contained former Lake Cahuilla. The site is open and relatively flat to the west but rises to the east as land rises to sea level. The site including the associated reservoir is 1,280 m (EW) in length and is 15 m in width (NS) except for the reservoir where it is 92 m wide. It is located between -40 ft. below and 5 ft. above sea level at about 1.4 km northeast of the Whitewater River and 320 m southwest of the Coachella Canal.

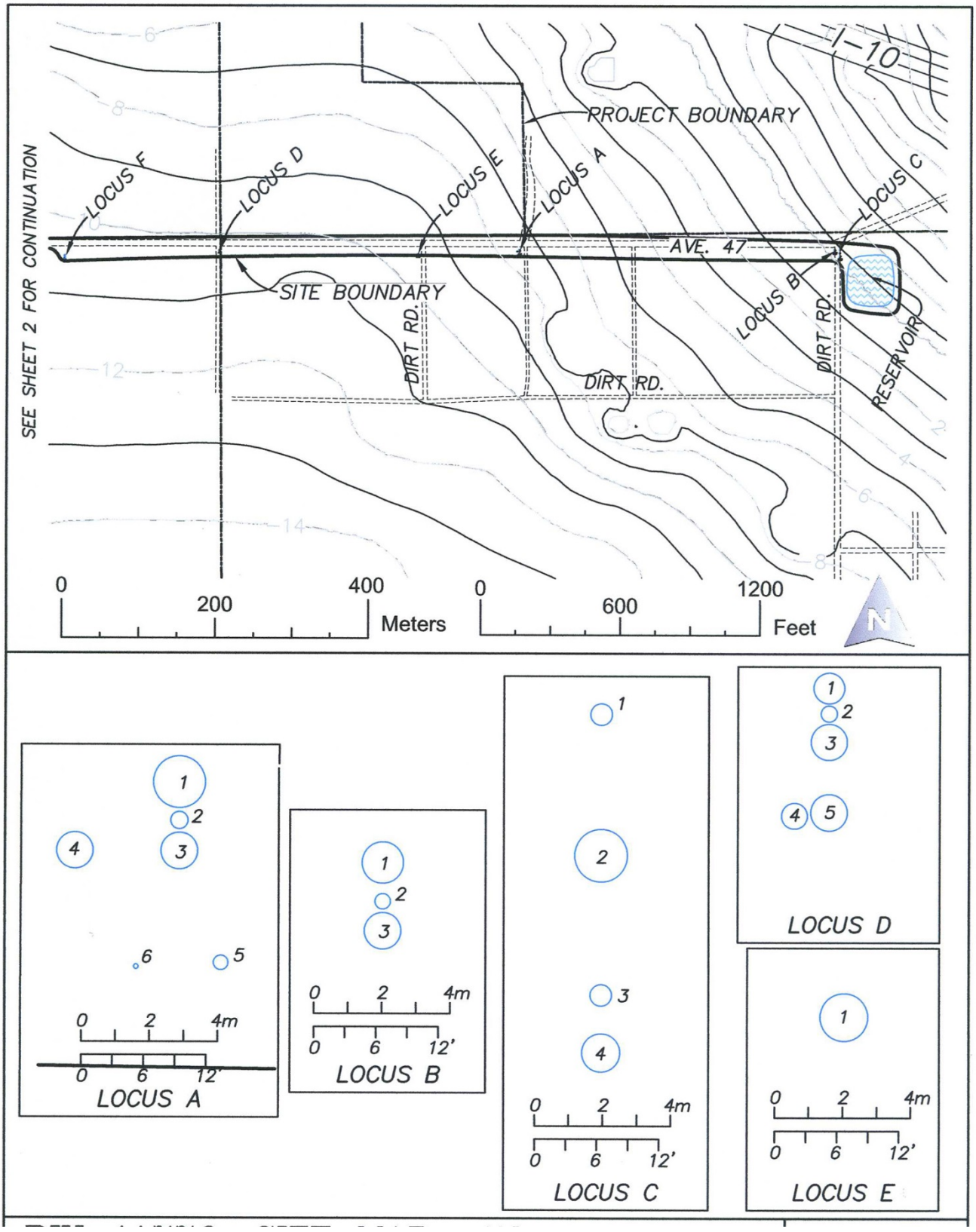


Figure 39A: RIV-11775, Loci A-F (see next page for Loci F and G)

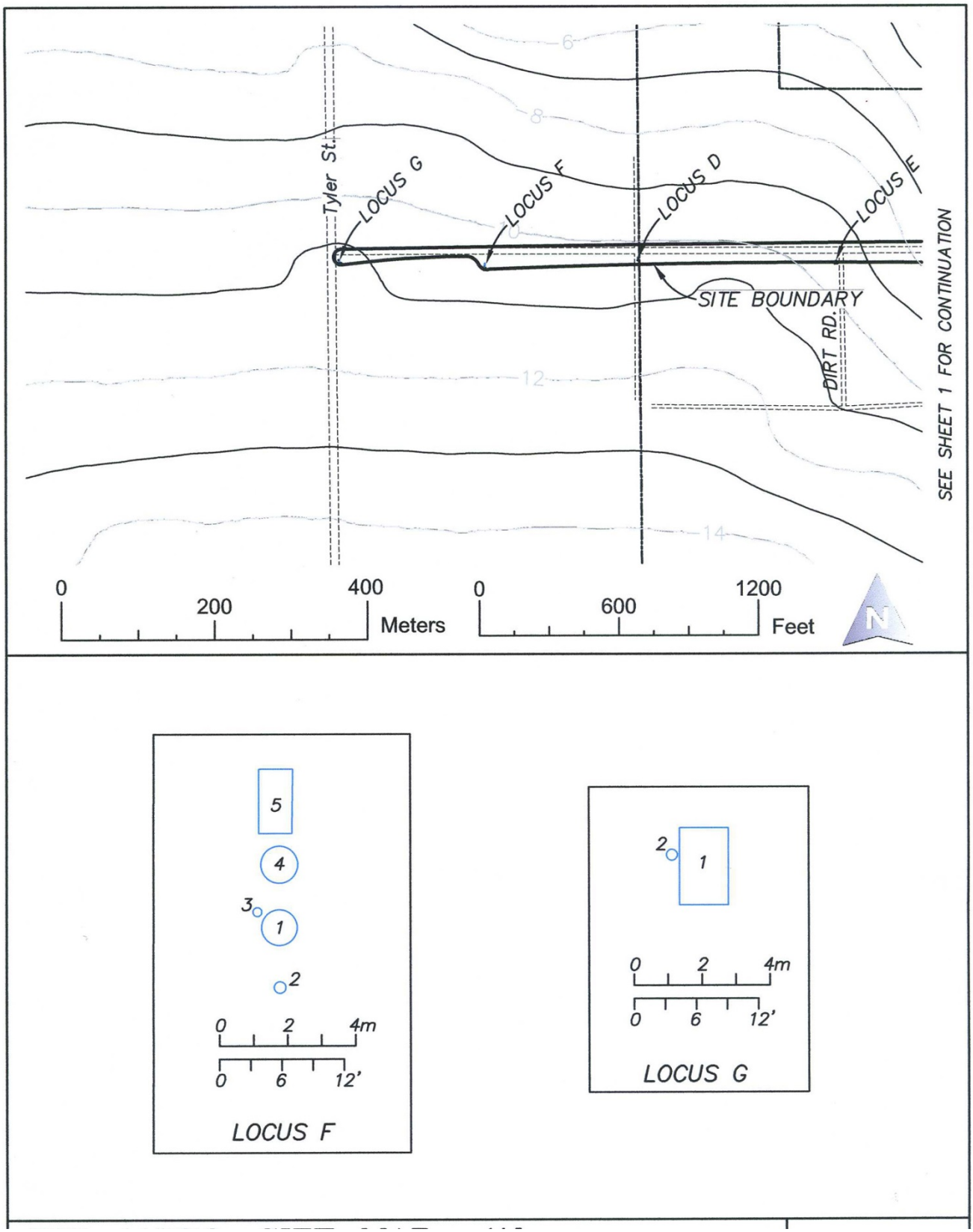


Figure 39B: RIV-11775, Loci F and G

Loci A-D, F and G have elements that are still in use; Locus E does not. All loci were built after World War II. Loci A, B and D contain older structures later replaced or abandoned. All elements of Locus C are currently in use and are probably directly associated with the adjacent reservoir, which was built after 1972 as it does not show up on the 1956 (photorevised 1972) USGS 7.5' *Indio* quad. Overall, this suggests the upgraded water control system at Locus C may be no more than 42 years old (1972-2014). The no-longer-used elements of Loci A, B, D, and E may date to the early 1950s and thus could be as old as 65 years. Functional interpretations of the water control features discussed below were in part provided by Phillip King (8/26/2014, personal communication) who has engineering experience in the field of water control. Details about each water control feature locus are summarized below:

Locus A: This locus measures 21 ft. (NS) by 17 ft. (EW); it consists of six features (see Photo Set 24 below).

1) large standpipe for a gravity flow pipeline: it is very tall because it is in a low spot of the pipeline. It is estimated to be about 19' tall with an external diameter is 5'. It consists of three cement pipe/buse sections; the lower two are about 97" (8' 2") in height; and the upper section is estimated to be about 1/3 of this height or 32", giving a total of 226" or about 19 feet. If a portable ladder is brought to the site, a metal ladder then allows one to scale to the top of the structure. It is still in use**.**
2) probable pipe water flow gauge**:** it is 4" south of #1 and consists of a small, low, capped cement pipe with a sliding metal cover that can be locked but is not. It measures 20" in diameter and is 9" in height. It is probably still in use.
3) older, broken cement standpipe: i t is 4.5" to the south of #2. It currently measures 42.5" in diameter and 74" (6'2") in height. It is no longer in use.
4) probably a variation on a Constant Head Orifice, a type of turnout often used in the 1970s and 1980s by the Bureau of Reclamation. It is divided into two sections and the metal fittings in the bottom could be inlet gates. It is 79" (6'7") to the west of #3. It is 42.5" in diameter and 28" in height. The top has been removed and it is no longer in use.
5) empty cement buse: this feature is 108" southeast of #3. It is 17" in diameter and 51.5" (4'3.5") in height. It is not currently in use.
6) tall metal pipe: it is 83" (6'11") west of #5. It is 117" (9'9") in height and 5" in diameter. It may be attached to a former small bore well. It does not appear to be currently in use.

Photo Set 24: Locus A of RIV-11775

Overview with Tall Standpipe Facing West

Overview Facing Northwest

Feature 4: Constant Head Orifice

Inside Feature 4

Feature 2: Probable Flow Gauge

Locus B: This locus measures 11 ft. (NS) by 4 ft. (EW); it consists of three features (see Photo Set 25).

1) a large standpipe: it is about 16' tall and is 4' in its external diameter. It is 80" (7'8") to the top of the lower section and an estimated 92" for the height of the upper section or a total of about 192" or 16'. If a portable ladder is brought to the site, a metal ladder then allows one to scale to the top of the structure. It is still in use.
2) probable valve box: it is 6" south of #1. It is a cement pipe whose upper portion has been broken off and it has a metal part at its base which is probably a broken valve handle. It measures 18" in diameter and is 16.5" high. It may have once served as a flow pressure valve. It is no longer in use.
3) water pressure regulator: it is about 4" south of #2. It is a cement cylinder (buse) that is 5'8" in height and 42.5" in external diameter; the cover, if it had one, has been removed. A tall metal pressure regulator device rests in the center. Water flowing into the cement structure has to rise to just under the top of the metal regulator where it then overflows into another pipe inside. This ensures that all irrigation upstream has the same pressure as it moves to the next pressure regulation structure. It is uncertain whether it is still in use as no water was evident in it the day it was recorded and some paper trash is visible in the bottom.

Locus C: This locus measures 35 ft. (NS) by 3 ft. (EW); it consists of four features (see Photo Set 26). Some or all may be associated with the water reservoir directly adjacent to the east, which was built after 1972.

1) probable pipe water flow gauge: it consists of a low, capped cement cylinder with an iron top whose opening is padlocked. It is 25.5" in diameter and 22" in height. Given the padlock, it is currently in use.
2) capped well with water flow gauge inside: the well is a cylindrical cement feature located 99" (8'3") south of #1. It is 61" in external diameter and 26.5" in height. The water flow gauge was made by Water Specialties which was bought up by McCrometer, the largest manufacturer of pipe flow gauges. Access to the flow gauge is provided by a small metal door (without a padlock). To access the gauge requires opening a closed green plastic lid. It is currently in use.
3) probable pipe water flow gauge: it is very similar to #1. It is 59.5" south of #2 and is 25" in diameter and 30" in height. It is padlocked and currently in use.
4) standpipe for gravity flow pipeline: it is located 32" south of #3. It measures 44.25" in diameter and 53.5" in height. It is nearly full of water that is slightly turbulent. It is clearly in use.