A Cultural Resource Survey of the 46kV Alternative and Additional Areas for the Rosemont Project 138kV Line

Pima County, Arizona

October 2011
A CULTURAL RESOURCES SURVEY OF THE 46KV ALTERNATIVE AND ADDITIONAL AREAS for the ROSEMONT PROJECT 138KV LINE PIMA COUNTY, ARIZONA

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Tucson, Arizona

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ASM Accession No. 2010-368
EPG Cultural Resource Services Technical Paper No. 2010-0017

Restrict Distribution
To prevent vandalism, restrict information in this report about the location of archaeological sites.

October 2011
EXECUTIVE SUMMARY

Augusta Resource Corporation, the parent company of the Rosemont Copper Company (Rosemont), proposes to develop and operate a copper mine (Rosemont operations) in the Santa Rita Mountains of Pima County. The Rosemont operations will be located primarily in T8S, R15 and 16E, north of Box Canyon Road and south of Mt. Fagan.

Rosemont has requested that TEP provide electricity to the operations site. TEP proposes to construct a new 138 kilovolt line between a proposed substation/switchyard 3.5 miles east of Interstate 19, and 3 miles south of Sahuarita Road and the proposed Rosemont Substation. Rosemont has contracted with EPG to work with TEP in siting the new line.

The project area of potential effect (APE) for the Class III cultural resources survey encompasses 1,375 acres. This APE is designed to accommodate the co-location of multiple utilities in a single corridor that is approximately 19.4 miles long. The width of the corridor varies, due to uncertainty regarding the precise location of the power transmission line.

The project is within portions of Sections 32 and 33, T17S, R14E; Sections 3, 4, 10, 11, 13, 14, and 24, T18S, R14E; Sections 15, 16, 20, 21, 22, 23, 29, 30, 31, and 32, T18S, R15E; Sections 1, 3, 4, 5, 10, 11, 12, and 13, T19S, R15E; and Sections 6, 7, 17, and 18, T19S, R16E; G&SRBM, as depicted on the Sahuarita, AZ, Corona de Tucson, AZ, Helvetia, AZ, Mount Fagan, AZ, Green Valley, AZ, and Empire Ranch, AZ, U.S. Geological Survey 7.5-minute topographic quadrangle maps.

A detailed records review in support of the proposed project area was conducted in August 2010 by archaeologist Dustin Sunderman. A total of 17 prior cultural resource surveys were conducted on lands that fall within a 1-mile buffer around the Class III survey area for the proposed project, and there are 100 previously recorded historic properties consisting of artifact scatters, extensive resource processing features (such as hearths and roasting pits), and limited historic remains. Of the 100 sites identified during the records review, 6 were noted to occur in the APE of the proposed project.

Of the six previously recorded sites in the APE, one site, was not relocated and may have eroded or been looted. Two sites, and , were revisited and combined into one site. This expanded site was given a new site number: Therefore, only five previously recorded sites are discussed in the survey results section.

A Class III field survey was conducted between June 28 and July 23, 2010, with a total of 95 field person days of effort. Dr. Steve Swanson directed the field survey and served as principal investigator; archaeologist Dustin Sunderman served as crew chief.

HISTORIC PROPERTIES IN THE PROJECT AREA

Five previously recorded sites and 11 newly recorded sites were identified in the Class III survey area. One previously recorded site, , was revisited but no cultural materials
could be identified in that location. The previously recorded and newly recorded sites are listed in Table E-1.

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<th>Site Number</th>
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<th>Description</th>
<th>Eligibility Recommendation</th>
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<td></td>
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</table>

Five previously recorded sites occur in the APE of the proposed project. The eligibility status of these sites was not evaluated during previous recordings. These sites were revisited and assessed for their eligibility during the field survey. Location was relocated and no cultural...
materials remain at this site, therefore, it is recommended not eligible for listing on the National Register of Historic Places (NRHP). The other four previously recorded sites are recommended eligible for listing on the NRHP under Criterion D, for their potential to provide information on the subsistence strategies of prehistoric populations in the southern Tucson Basin area.

Eleven newly identified sites were recorded during the Class III survey. Seven of these sites are recommended eligible for listing on the NRHP under Criterion D for their information potential; one site is recommended eligible for listing on the NRHP under Criterion A, as it is associated with events that have made a significant contribution to broad patterns of our history and under Criterion C, because it embodies distinctive characteristics of a type, period, or method of construction; and three sites are recommended not eligible for listing on the NRHP.

For the proposed project, it is possible that adverse effects to sites eligible for listing on the NRHP under Criterion D (or contributing components thereof) can be avoided through selective tower placement. In these instances, it is our recommendation that those eligible historic properties be barricaded prior to construction, and that an archaeological monitor be present for avoidance monitoring when construction occurs within 100 feet of the sites. If these sites can be avoided by the proposed project, we recommend a finding of no adverse effect to the historic properties. In the event that these sites are not able to be avoided by the project, we anticipate that the project will have an adverse effect to the historic properties. In order to mitigate the adverse effects the proposed project would have on the historic properties, a treatment plan would need to be developed in consultation with the Arizona State Land Department and the Arizona State Historic Preservation Office (SHPO).

For the site eligible for listing on the NRHP under Criteria A and C, construction of modern utility lines could have adverse effects to the visual integrity of the site. Potential adverse effects to this property would need to be mitigated through implementation of a treatment plan developed in consultation with the Coronado National Forest and Arizona SHPO.

There were 48 isolated occurrences (cultural materials that do not meet criteria established by ASM for classification as a historic property) found during the Class III survey. Because none of these occurrences meets the definitions of an archaeological site or other historic property, none is eligible for listing on the NRHP.

In the event human remains or funerary objects are discovered during construction of the proposed project, all work in the area should cease and the finding(s) be reported to either the director of the ASM or designee in accordance with Arizona Revised Statutes § 41-844 and § 41-865.
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ABSTRACT

Project Title: Rosemont Project 138kV Line Corridor

Report Title: A Cultural Resources Survey of 46kV alternative and additional areas for the Rosemont Project 138kV Line, Pima County, Arizona (revised)

Report Date: October 2011

Agencies: Arizona State Land Department (ASLD), Coronado National Forest (CNF), and Bureau of Land Management

Permit Number: Arizona Blanket Permit 2010-0044bl; Arizona State Museum (ASM) Accession Number 2010-368, CNF Permit SUP0107

Project Number: EPG Project Number RMC 0001.006

Project Description: Augusta Resource Corporation, the parent company of the Rosemont Copper Company (Rosemont), proposes to develop and operate a copper mine (Rosemont operations) in the Santa Rita Mountains of Pima County. The Rosemont operations will be located primarily in T8S, R15 and 16E, north of the Box Canyon Road and south of Mt. Fagan.

Rosemont has requested that TEP provide electricity to the operations site. TEP proposes to construct a new 138 kilovolt line between a proposed substation/switchyard 3.5 miles east of Interstate 19, and 3 miles south of Sahuarita Road and the proposed Rosemont Substation. Rosemont has contracted with EPG to work with TEP in siting the new line.

The project area of potential effect (APE) for the Class III cultural resources survey encompasses 1,375 acres. This APE is designed to accommodate the collocation of multiple utilities in a single corridor that is approximately 19.4 miles long. The width of the corridor varies due to uncertainty regarding the precise location of the proposed power transmission line.

Acreage and Jurisdiction: The survey consisted of a total of 1,375 acres. Of these, 840.4 acres are on state land under the jurisdiction of the Arizona State Land Department (ASLD), 477.1 acres are on CNF land managed by the USFS, 40.8 acres are on land managed by the Bureau of Land Management (BLM), and the remaining 16.7 acres are on private land.

Location: The project is within portions of Sections 32 and 33, T17S, R14E; Sections 3, 4, 10, 11, 13, 14, and 24, T18S, R14E; Sections 15, 16, 20,
Personnel and Dates of Fieldwork:
The detailed records review, in support of the proposed project, was conducted in August 2010 by archaeologist Dustin Sunderman. Dr. Steve Swanson directed the field survey project and served as principal investigator; archaeologist Dustin Sunderman served as crew chief. A Class III field survey was conducted between June 28 and July 23, 2010, with a total of 95 field person days of effort.

Register-eligible Sites:

Register-ineligible Sites:

Recommendations:
Five previously recorded sites occur in the APE of the proposed project. The eligibility status of these sites was not evaluated during previous recordings. These sites were revisited and assessed for their eligibility during the field survey. [Site was relocated and no cultural materials remain at this site, therefore, it is recommended not eligible for listing on the National Register of Historic Places (NRHP).] The other four previously recorded sites are recommended eligible for listing on the NRHP under Criterion D, for their potential to provide information on the subsistence strategies of prehistoric populations in the southern Tucson Basin area.

Eleven newly identified sites were recorded during the Class III survey. Seven of these sites are recommended eligible for listing on the NRHP under Criterion D for their information potential; one site is recommended eligible for listing on the NRHP under Criterion A, as it is associated with events that have made a significant contribution to broad patterns of our history and under Criterion C, because it embodies distinctive characteristics of a type, period, or method of construction; and three sites are recommended not eligible for listing on the NRHP.

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For the site recommended eligible for listing on the NRHP under Criteria A and C, construction of modern utility lines could have adverse effects to the visual integrity of the site. Potential adverse effects to this property would need to be mitigated through implementation of a treatment plan developed in consultation with the Coronado National Forest and Arizona SHPO.

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INTRODUCTION

Rosemont Copper Company (Rosemont) retained EPG, Inc. to conduct a cultural resource survey of the proposed location of the Rosemont utility corridor for a 138 kilovolt (kV) transmission line (proposed project [Figure 1]). These studies are intended to assist in compliance with the Arizona State Historic Preservation Act. The U.S. Forest Service (USFS) has been designated as the lead agency for the proposed project for Section 106 compliance.

Project Description

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The survey consisted of a total of 1,375 acres. Of these, 840.4 acres are on state land under the jurisdiction of the Arizona State Land Department (ASLD), 477.1 acres are on CNF land managed by the USFS, 40.8 acres are on land managed by the Bureau of Land Management (BLM), and the remaining 16.7 acres are on private land.
Figure 1. Project Location.
ENVIRONMENTAL SETTING

Although environmental factors do not determine the course of human events, the environment affects the actions and interactions of all human groups. Thus, it is important to characterize the local environment of the project area as a context for understanding the cultural history of the area.

Vegetation in the western portion of the surveyed area is predominantly Sonoran Desertscrub and Chihuahuan Desertscrub (Photograph 1), with Semidesert Grassland in the foothills and bajadas emanating from the Santa Rita Mountains (Brown 1994). The Sonoran Desertscrub vegetation comprises primarily the mixed palo verde-cacti association that gives way locally to elements of the Lower Colorado River Valley Subdivision of the Sonoran Desert. The primary Lower Colorado River Valley Subdivision association present is creosote bush (*Larrea tridentata*)-bursage (*Ambrosia* sp.). In many areas, the mixed palo verde-cacti association is best represented along ephemeral drainage ways by creosote bush. Chihuahuan Desertscrub, found mainly in the east-central portion of the study area (Photograph 2), is a shrub-dominated desert formation with creosote bush, whitethorn, mariola (*Parthenium incanum*), banana yucca (*Yucca*...
baccata), and ocotillo (*Fouquieria splendens*). Vegetation in the Semidesert Grassland is dominated by velvet mesquite, foothill palo verde (*Parkinsonia microphylla*), blue palo verde (*P. florida*), chain-fruit cholla (*Opuntia fulgida*), cane cholla (*O. spinosior*), Santa Rita or purple prickly pear (*O. violacea*), browspine prickly pear (*O. phaeacantha*), and barrel cactus (*Ferocactus wislizenii*). Vegetation growing on the banks of ephemeral watercourses in Semidesert Grassland, creosote bush-bursage associations, and in the palo verde-mixed cacti association generally consists of the same tree and shrub species, including mesquite (*Prosopis juliflora*), blue palo verde, catclaw (*Acacia greggii*), desert hackberry (*Celtis pallida*), and wolfberry (*Lycium* sp.).

The southeast portion of the project area is variously dominated by Semidesert Grassland, Chihuahuan Desertscrub, and an evergreen oak (encinal) component in the higher elevations of the Santa Rita Mountains. The evergreen oak woodland component of the study area is restricted to the southeast part of the area. It is dominated by a variety of perennial grass species, along with several species of oak (*Quercus* sp.) and juniper (*Juniperus* sp.).

**Photograph 2.** Overview of project area, eastern side, view to the southwest.
CULTURE HISTORY

The history of the Tucson Basin is one that shows a close relationship between people and the natural environment. The desert environment has strongly influenced subsistence practices and as a result, social organization. Changes in the social environment have often made it possible to more efficiently exploit environmental resources. Over time, adaptations to the arid region have become more specialized and regional in scope. By AD 650, Tucson Basin groups could be differentiated from those living in other areas of the Southwest. The cultural chronology of groups living in the Tucson Basin is summarized in Table 2.

Table 2. Cultural Chronology of the Tucson Basin

<table>
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<tr>
<td>Paleoindian</td>
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<td>11,500 BC – 7500 BC</td>
</tr>
</tbody>
</table>

1Adapted from Thiel and Diehl 2006

Paleoindian Period (11,500 BC to 7500 BC)

The earliest use of the Tucson Basin was during the Paleoindian Period (approximately 13,000 years ago), a time when the climate was both wetter and cooler than today. This period was characterized by small, mobile groups of hunter-gatherers who briefly occupied temporary campsites during their search of food and other resources (Cordell 1997:67). Paleoindian remains
are rare in the Tucson Basin, compared with the number of sites of this age found to the east in the San Pedro River Valley. A Clovis fluted spear point was collected from the Valencia site, AZ BB:13:74(ASM), located along the Santa Cruz River in the southern Tucson Basin (Doelle 1985:181-182). Another fluted Paleoindian point was found in Rattlesnake Pass, in the northern Tucson Basin (Agenbroad 1967). These rare finds suggest prehistoric use of the Tucson basin region began at this time. Post-Clovis occupation of the Tucson Basin by Paleoindian groups is indicated by Plainview-like, unfluted spear points found in several locations (Mabry 1998:47).

**Archaic Period (7500 BC to 1200 BC)**

Climatic changes associated with the end of the last Glacial Period marked the transition from the Paleoindian Period to the Archaic Period. The Tucson Basin became warmer and drier, so that by the end of this time the environment came to look much as it does today. The establishment of the Sonoran Desert communities provided a greater mixture of subsistence opportunities, particularly with wild plants. Archaic Period people pursued a mixed subsistence strategy, characterized by intensive wild plant gathering and the hunting of small animals. The only Early Archaic (7500 BC to 6500 BC) site known from the Tucson Basin is found in Ruelas Canyon, south of the Tortolita Mountains (Swartz 1998:24). Middle Archaic sites, dating between 3500 BC and 2100 BC, are known from the bajadas surrounding Tucson and floodplain and mountain areas. Middle Archaic sites have been excavated in the Tucson Basin along the Santa Cruz River (Gregory 1999) and the southern foothills and bajada of the Santa Catalina Mountains (Chavarria 1996; Dart 1984, 1986; Douglas and Craig 1986). Archaic Period sites in the Santa Cruz floodplain were found to be deeply buried by alluvial sediments, suggesting more of these sites are present but undiscovered, due to the lack of surface evidence.

**Early Agricultural Period (1200 BC to AD 50)**

The Early Agricultural Period (previously called the Late Archaic Period) began with the introduction of domesticated plant species in the greater Southwest. The timing of the introduction of cultigens from Mexico is not known. Radiocarbon dates on maize suggest that its cultivation in the Tucson Basin and other areas of the Southwest was underway by 1200 BC (Mabry 2006). By 400 BC, substantial agricultural settlements existed on the Santa Cruz River floodplain. Recent archaeological investigations suggest canal irrigation also began sometime during this period.

Archaeological excavations have revealed Early Agricultural Period sites in the Tucson Basin and its vicinity (Diehl 1997; Ezzo and Deaver 1998; Freeman 1998; Gregory 2001; Huckell and Huckell 1984; Huckell et al. 1995; Mabry 1998, 2006). These sites tend to contain small, round, or oval semi-subterranean pit houses, many with large internal storage pits. At some sites a larger, round structure is also present, which is thought to have been for communal or ritual purposes. Stylistically distinctive Cienega, Cortaro, Empire, and San Pedro type projectile points are common, as are a range of groundstone and flaked-stone tools, ornaments, and marine shell jewelry (Diehl 1997; Mabry 1998). The presence of marine shell and certain lithic materials not locally available in the Tucson area suggests trade networks were operating. Agriculture, particularly the cultivation of maize, was important in the diet. Dependence on gathered wild
plants such as tansy mustard and amaranth seeds, mesquite seeds and pods, and agave hearts was still common. Protein was provided by hunting of animals such as deer, cottontail rabbits, and jackrabbits.

**Early Ceramic Period (AD 50 to AD 500)**

Ceramic artifacts, including figurines and crude pottery, were first produced in the Tucson Basin at the beginning of the Early Agricultural Period (Heidke and Ferg 2001; Heidke et al. 1998); however, the widespread use of ceramic containers did not occur until the transition to the Early Ceramic Period (Huckell 1993). Undecorated plainware pottery was widely used in the Tucson Basin by roughly AD 50, at the start of the Agua Caliente Phase (AD 50 to AD 500).

During the Early Ceramic Period, architecture became more formalized and substantial, perhaps indicating the investment in more permanent settlements (Wallace 2003). Pit house styles were varied throughout this period and included small, round, and basin-shaped houses, and slightly larger sub-rectangular structures. Significantly larger structures may have functioned as communal or ritual structures.

Reliance on agricultural crops increased, with a wide variety of cultigens—including maize, beans, squash, cotton, and agave—becoming the staple part of the subsistence economy. Populations grew as farmers expanded their crop production to floodplain land near permanently flowing streams; canal irrigation systems are also assumed to have expanded. Evidence from archaeological excavations indicates trade in shell, turquoise, and obsidian, while new trade networks developed (Thiel and Diehl 2006).

**The Hohokam (AD 500 to AD 1450)**

The Hohokam tradition developed in the deserts of central and southern Arizona around AD 500 and is characterized by the introduction of redware and decorated ceramics—red-on-buff-ware in the Phoenix Basin and red-on-brown-ware in the Tucson Basin (Doyel 1991; Wallace et al. 1995). Redware pottery was introduced to the ceramic assemblage during the Tortolita phase (AD 500 to AD 700). Through time Hohokam pottery became increasingly decorated with highly distinctive geometric figures and life forms such as birds, humans, and reptiles.

The Hohokam sequence is divided into the Preclassic (AD 500 to AD 1150) and Classic (AD 1150 to AD 1450) occupations. At the start of the Preclassic, small pit-house hamlets and villages were clustered around the Santa Cruz River. Around AD 750, large, nucleated villages were established along the river or its major tributaries. Smaller settlements in outlying areas served as seasonal camps for hunting, gathering, or limited agriculture (Doelle and Wallace 1991). Some riverine villages had large, basin-shaped earthen embankments. These features probably served as arenas for playing a type of ball game, as well as for holding religious ceremonies and other communal activities (Wilcox 1991; Wilcox and Sternberg 1983).

Between AD 950 and AD 1150, Hohokam settlement in the Tucson area became more dispersed, with people using the extensive bajada zone as well as the valley floor (Doelle and Wallace 1986). Possibly driven by an increase in population, functionally specific seasonal sites and more
permanent habitations were now situated away from the river. The largest sites were still situated on the terraces just above the Santa Cruz River. There is evidence for increasing specialization in ceramic manufacture at this time, with some village sites producing decorated red-on-brown ceramics for trade throughout the Tucson area (Harry 2000; Heidke 1988, 1996; Huntington 1986).

Dramatic changes in settlement patterns, and possibly in social organization, are seen in the Classic Period. Above-ground adobe compound architecture appears for the first time, supplementing traditional semi-subterranean pit house architecture (Crown 1991). Maize agriculture was still the primary subsistence focus; however, extremely large Classic Period rock-pile field systems associated with the cultivation of agave have been found in both the northern and southern portions of the Tucson Basin (Doelle and Wallace 1991; Fish et al. 1992).

Platform mounds are found at a number of Tucson Basin villages dating around AD 1275 to AD 1300 (Gabel 1931), and are similar to mounds that occur throughout southern and central Arizona. Platform mounds typically consist of a central structure that was deliberately filled to create an elevated room on a platform. The function of this room is unclear. Some were undoubtedly used for habitation, while others may have been primarily ceremonial. The construction of a platform mound required a fair degree of organization and labor; such mounds are thought to be symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish et al. 1992; Gregory 1987). Around the time that the platform mounds were constructed, most of the smaller sites were abandoned. Tucson Basin populations were largely concentrated at a half-dozen large, aggregated communities. Research has suggested that aggregation and abandonment in the Tucson area may be related to an increase in conflict and possibly warfare (Wallace and Doelle 1998). By AD 1450, the Hohokam tradition, as presently known, disappeared from the archaeological record.

**Protohistoric Period (AD 1450 to AD 1694)**

Little is known of the period from AD 1450 to AD 1694, when Father Eusebio Francisco Kino first traveled to the Tucson Basin (Doelle 1984). By this time the Hohokam tradition had disappeared and many of the native groups present today were first identified. Living west of the Santa Cruz River were the Tohono O’odham; along the San Pedro and Santa Cruz rivers were a people known as the Sobaipuri (Doelle and Wallace 1990; Massie 1981). Both groups spoke the Piman language and lived in oval, jacal surface dwellings. The mission of San Xavier del Bac was established by Spanish Jesuit priests. One of the larger Sobaipuri communities was located at Bac; however, due to the paucity of documents and archaeological research, little can be said regarding this period.

**Spanish and Mexican Periods (AD 1694 to AD 1856)**

Spanish exploration of southern Arizona began at the end of the seventeenth century. Early Spanish explorers in the Southwest noted the presence of Native Americans living in the Tucson area; this was the largest concentration of population in southern Arizona (Doelle and Wallace 1990). Father Bernard Middendorf arrived in the Tucson area in 1757, and within 15 years the
construction of the San Agustín Mission, near the base of A-Mountain, was begun. By 1773 the church was completed (Dobyns 1976:33).

In 1775, the site for the Presidio of Tucson was selected on the eastern margin of the Santa Cruz River floodplain. The Presidio of Tucson was one of several forts built both to counter the threat of Apache raiding groups who had entered the region at about the same time as the Spanish, and to establish Spain’s hold on this part of the frontier against encroachment by other European powers (Thiel et al. 1995; Wilcox 1981). With the presidio for protection, Spanish colonists established farms along the Santa Cruz River, mined in the surrounding hills, and grazed cattle. Spanish goods, and the relative safety provided by the presidio, attracted indigenous settlers. The Spanish and Native American farmers grew corn, wheat, and vegetables, and cultivated fruit orchards.

After gaining independence from Spain in 1821, Mexican settlers continued farming, ranching, and mining activities in the Tucson Basin, until the threat of Apache raids forced them out of all but the presidio. The San Agustín Mission was abandoned in 1831, followed by much of the rest of the Tucson Basin (Elson and Doelle 1987; Hard and Doelle 1978).

**American Territorial and American Statehood Periods (AD 1856 to Present)**

The 1848 resolution of the Mexican-American War and the 1853 Gadsden Purchase resulted in Mexico ceding much of the Greater Southwest to the United States and establishing the international boundary at its present location. In the wake of the California gold rush, mining was the impetus for much of the Euro-American migration into the area in the mid-1800s. After the Gadsden Purchase of 1853, American prospectors poured into the Southwest to claim silver deposits previously known to the Spanish and Mexicans in the Santa Rita Mountains. The Santa Rita mine began operations in 1856. American prospecting and silver mining in the Santa Rita Mountains led to conflicts with the Apaches. One Apache raid killed all but one employee of the Santa Rita mine (Keane and Rogge 1992).

Railroads arrived in Tucson in the 1880s. The railroads not only brought goods and services previously unavailable in most of Arizona, but also an influx of new Anglo-American settlers. The surrender of Geronimo in 1886 ended Apache raiding, and the region’s settlement boomed as people felt safe to establish homes, ranches, and businesses away from the protection of the army. Local industries associated with mining and manufacturing grew, and the railroad supplied the Santa Cruz River Valley with commodities it could not produce locally. Homesteaders established numerous cattle ranches in outlying areas, bringing additional residents and income to the area.

By the twentieth century municipal improvements to water and sewer service, as well as the introduction of electricity, made life in southern Arizona more hospitable (Mabry et al. 1994). New residences and businesses continued to appear within an ever-widening perimeter around Tucson, and city limits stretched to accommodate the growing population. Tourism, the health industry, and activities centered on the University of Arizona and Davis-Monthan Air Force Base have contributed significantly to growth and development in the Tucson Basin in the twentieth century (Sonnichsen 1982).
Noteworthy twentieth century events in the area include the establishment of the Santa Rita Experimental Range (SRER), now operated by the University of Arizona, and the creation of the communities of Sahuarita and Helvetia. SRER is located approximately 15 miles south of Tucson. Established in 1903 by the U.S. Department of Agriculture, it is the oldest experimental range in the country, managed by the USFS until 1987, when the administration was taken over by the University of Arizona, College of Agriculture. SRER includes more than 80 square miles—spanning Sonoran Desert at less than 3,000 feet elevation and receiving less than 10 inches of precipitation—to semi-arid grassland scrub at 4,500 feet elevation and receiving approximately 18 inches of annual precipitation. SRER was founded to study range recovery from drought and overgrazing, as well as sustainable grazing practices. Livestock grazing has been studied by university and government scientists at SRER for more than 80 years. Parts of the rangeland have been excluded from grazing since 1903, and many ecological and wildlife studies have been conducted on grazed and ungrazed areas at SRER through the use of an archive of repeat photos, some dating back to 1903 (University of Arizona, College of Agriculture and Life Sciences 2010).

Helvetia (AZ EE:1:80[ASM]) was founded in 1891 for the settlement of workers from the surrounding copper mines. At its peak, the city had 550 inhabitants, most of which were Mexicans. In 1911, the Helvetia mines closed due to low commodity prices, though mining activity in the surrounding area continued into the 1950s. The Helvetia Post Office opened on December 12, 1899 and closed on December 31, 1921, thus marking the end of the town (Ezzo et al. 2009). Currently, Helvetia consists of little more than a few foundation walls, traces of a cemetery, and a scattering of slag heaps and mine shafts.

The Town of Sahuarita was founded in 1911 (Arizona Department of Commerce 2008) and incorporated in 1994 (Town of Sahuarita 2007). During World War II, Sahuarita was home to an agricultural effort focused on cultivation of rubber producing plants such as guayule, a German prisoner of war camp, and a bombing and gunnery range used to train Army Air Force aircrews.

The Civilian Conservation Corps (CCC) operated from 1933 to 1942 and was part of the “New Deal” legislation instituted by the United States Government during the Great Depression. The CCC was designed to put men ages 18 to 24 to work in unskilled labor positions, mostly performing construction and preservation work. The CCC provided food and lodging, as well as pay for the work done. Each camp was a small settlement. Typical work tasks conducted by CCC camps included agricultural activities (planting trees, pest control, collection of seeds, burning brush), construction activities (building roads, trails, and buildings) and campground improvements (fireplace construction, forest shelters, rustic tables, benches, drinking water, and sanitation facilities).

In the early twentieth century, the road networks in Arizona’s National Forests were not well developed, so the USFS built district ranger stations to house full-time employees and provide logistics support to fire patrols and project crews working at remote forest sites (CCC Legacy 2004). By the middle of 1933, four CCC camps, each with approximately 175 men, had been established in the CNF. The CCC worked on a variety of projects in the forest, including building and maintaining roads, trails, and telephone lines; range improvements; erosion control; and recreation and protection improvements (Coronado Bulletin 1933).
METHODS

Records Review

EPG conducted a literature review for the proposed project. Records at the following institutions were reviewed:

- Arizona State Historic Preservation Office
  - National Register of Historic Places (NRHP)
  - Arizona State Register of Historic Places
- AZSITE Database (University of Arizona 2010)
- BLM Arizona State Office (General Land Office [GLO] Maps)
- CNF

The goal of the review was to identify any prior cultural resource surveys or archaeological and historical sites within 1 mile of the APE, and assess the potential for the project to affect cultural resources. The detailed records review, in support of the proposed project, was conducted in August 2010 by archaeologist Dustin Sunderman.

Research Themes and Goals

The primary purpose of the proposed pedestrian survey is to generate an inventory of sites and isolated historic materials in the project area. These will be documented according to the Arizona SHPO and ASM standards and guidelines, and their historic significance assessed by applying National Register criteria outlined in 36 CFR § 60.4, so that recommendations for mitigation of impacts can be made.

Potential Research Themes

Potential research themes that may be informed through intensive pedestrian survey in the project area include prehistoric settlement patterns, land use practices, and economic interaction. While we divide these into three different research themes, they are intricately interrelated; the analytical results of each are critical for evaluating the other themes.

Land Use

The locations of small prehistoric sites in the project vicinity display elevational differences that may reflect the prehistoric distributions of resources. Because this is a non-collection, non-excavation project, we cannot recover and analyze in situ plant or animal remains from sites identified during survey. Nevertheless, the types of features and tools at a site provide information on the kinds of resources that may have been acquired and/or processed in the past. For this research theme, if sufficient data are recovered, we will examine feature and tool types from small upland versus small lowland sites in the project area to assess the extent to which these reflect different land use practices.
Settlement Patterns

Previously recorded sites in the project vicinity suggest that there may be patterning in the location of large habitation sites and smaller resource processing sites. To assess whether there are discernible patterns in the relative locations of potentially contemporary sites, we will identify temporally diagnostic materials to assign chronological designators to sites and isolated occurrence, and use feature types and artifact assemblages to generate an understanding of site function. These data will be combined with survey results obtained by EPG in the fall of 2009—which covers a similar sized area 1.5 miles north and parallel to the current linear project—and used identical field methods. The combined data set will be used to assess patterns in settlement location and function over time.

Economic Interaction

Previously recorded sites in the area include large Preclassic and Classic period habitation sites, with some situated along the Santa Cruz River floodplain below 3,000 feet in elevation, and others at the upper end of the bajada above 4,000 feet in elevation. As outlined in the previous research question, varying site settings may reflect different land use strategies. If so, did this influence the extent to which site inhabitants engaged in distant economic interactions or their degree of integration into larger Southwest exchange networks? To address this research question we will identify whether there are differences in the presence of exotic items (e.g., non-local pottery, non-local shell) at floodplain versus bajada habitation sites.

The field strategies outlined below will be used to address research questions. They were designed to comply with ASM, SHPO, and Arizona Board of Regents guidelines, and also to be consistent with the field strategies used during our recent 2009 survey just north of, and generally parallel to, the current survey area, to facilitate data comparability.

Intensive Pedestrian Survey

The fieldwork was conducted between June 28 and July 23, 2010. Dr. Steve Swanson directed the field survey project and served as principal investigator; archaeologist Dustin Sunderman served as crew chief. A total of 95 field person days of effort were devoted to the fieldwork.

The field crew identified the survey areas using aerial photographs, and confirmed these locations with a Magellan Mobile Mapper CX global positioning system (GPS) with an accuracy of 2–3 meters RMSE. The field crew surveyed the APE by walking systematic, parallel pedestrian transects, spaced no more than 15 meters (approximately 50 feet) apart and oriented parallel to the centerline of the survey corridor. A GPS was used to map the location of isolated artifacts, features, artifact scatters, and sites found during the survey.

Site identification and boundaries were defined according to the ASM guidelines. The ASM Site Recording Manual (version 1.1) defines a site as the physical remains of past human activity that are at least 50 years old. ASM letters dated October 1, 1994, and August 21, 1995, further specify what may constitute a site, including the following:
• 30 or more artifacts of a single class within an area of 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source

• 20 or more artifacts, including at least two classes of artifact types within an area of 15 meters (50 feet) in diameter

• 2 or more temporally associated archaeological features without any artifacts

ASM recognizes that there may be unique situations where materials not meeting the above criteria warrant designation as an archaeological site, and authorizes qualified archaeologists to use professional judgment in making appropriate site determinations. One such circumstance would include non-linear, isolated features devoid of artifacts. ASM defines an isolated feature as one that does not have any additional features within a 100-meter (328 feet) radius. Examples of non-linear features include isolated rock piles, mine shafts, prospecting pits, and unidentified depressions. In these types of situations, ASM allows archaeologists to make decisions concerning the classification of these features as a site.

All cultural materials were recorded according to their type and material, with features and isolated artifacts plotted with a GPS. Within each artifact class, further designations were used to describe each artifact. These designations were used to draw inferences concerning the activities that may have occurred at each location. Designations include brief descriptions of the stages of manufacture and the degree of core reduction in chipped-stone materials, the location of wear on groundstone items, and the ceramic style (if identifiable). Temporally diagnostic artifacts were either drawn by hand or photographed. Artifact density at archaeological sites was calculated on the basis of surface artifact quantity across the total site area.

Chipped-stone material was identified according to the stages of lithic manufacturing and was labeled as primary, secondary, or tertiary flakes. Each of the flake types have been defined as follows:

• Primary flakes have 100 percent cortex on dorsal side and are the result of initial core reduction.

• Secondary flakes have less than 100 percent cortex and represent the middle process of tool manufacturing.

• Tertiary flakes are typically very thin and do not have cortex; these flakes represent the last stage in tool manufacturing.

Ceramics are important temporal and cultural indicators. All ceramics were recorded according to ware (plainware, redware, etc.). If a design element was present and was sufficient to allow a confident identification, the ceramic was recorded to specific type.

When cultural material was identified in the field, the crew examined the surrounding area to determine whether any additional artifacts were present. From the presence or absence of additional cultural materials, members of the field crew determined whether the artifact was part of a site or an isolated occurrence. The site integrity and subsurface potential of each site was evaluated as accurately as possible, based solely upon surface observation. No artifact collections were made and no surface testing was conducted during the survey.
**National Register Assessment**

Sites were evaluated in the field as to their eligibility for listing on the NRHP. The eligibility of a property for listing on the NRHP may be based on national, state, or local significance. Properties eligible for listing must demonstrate importance in American history, architecture, archaeology, engineering, or culture, and:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. that have yielded, or may be likely to yield, information important in prehistory or history. [36 CFR § 60.4]

In addition to demonstrating significance in one or more categories cited above, a property must also demonstrate integrity. The historic property must be a preservable entity that demonstrates the qualities that make it significant. Integrity is most often assessed based on the condition of the site’s location, setting, design, materials, workmanship, feeling, and association.

**RECORDS REVIEW**

The literature review revealed that within 1 mile of the project APE, there have been 17 cultural resource surveys conducted, and a total of 100 historic properties have been recorded.

**Prior Cultural Resource Studies**

A list of prior cultural resources studies is provided in Table 3, and their locations are plotted on Figure 2a through Figure 2g. The earliest survey identified was a survey conducted in 1975 (Debowski 1980). Other studies identified include work associated with scholarly research (Buttery 1987), state land survey (Rozen 1989a), the expansion of mining operations (Stone 1999; Christenson 2006; Ezzo et al. 2009), soil surveys (Lange 1999; Twilling 2003), road surveys (Archer et al. 2000; Heilen and Stephen 2001), and transmissions lines (Fenicle et al. 1988; Stephen 1995; Tucker 1997). These surveys identified numerous historic properties.
<table>
<thead>
<tr>
<th>Project Name</th>
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<th>Reference</th>
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Figure 2a. Previous Surveys
Figure 2b. Previous Surveys
Figure 2c. Previous Surveys
Figure 2d. Previous Surveys
Figure 2e. Previous Surveys
Figure 2f. Previous Surveys
Previously Recorded Sites

During the records review, 100 previously recorded sites were identified, consisting of both prehistoric and historic properties. Table 4 provides summary information for these sites (see Figures 2a through 2g for the locations).

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Table 4. Previously Recorded Sites
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<td>Size (m²)</td>
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Table 4. Previously Recorded Sites

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<td>Spoerl 1984a</td>
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<td>South and Gillespie 1992</td>
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<td>Unevaluated</td>
<td>LeBlanc and Gillespie 2006</td>
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</tbody>
</table>

1 Site location and/or shape in Coronado National Forest and AZSITE databases is not consistent

General Land Office Plat Maps

The historic GLO plat maps listed below were reviewed to determine whether any potential historic features were within the project study area.

- T17S, R14E, dated 1873 and 1947
- T18S, R14E, dated 1873, 1903, and 1947
- T18S, R15E, dated 1915
- T19S, R15E, dated 1929
- T19S, R16E, dated 1875

The T18S, R14E map, dated 1947, portrays a variety of dirt roads and one stock tank; none of these was observed during the pedestrian survey. The maps for T18S, R15E depict numerous roads, including one labeled “Road to Helvetia,” as well as a series of claims associated with the Helvetia. These claims are outside the APE for the current project. None of the maps for T17S, R14E; T19S, R15E; or T19S, R16E indicated the presence of historic resources in the APE.

**SURVEY EXPECTATIONS**

The information identified in the literature review indicates that there are likely to be numerous sites encountered during Class III survey of the area. Prehistoric sites consist of numerous artifact scatters, extensive resource processing features such as hearths and roasting pits, and very limited historic remains. Lithic and ceramic materials are the most common materials recorded at prehistoric sites. Lithics occur at 92 percent and ceramics at 78 percent of recorded sites. While less abundant, groundstone artifacts have been noted at 21 percent of the previously recorded sites. The most commonly noted features at prehistoric sites in the study area are rock piles (16 percent), followed by hearths (10 percent), surface or subsurface structures (10 percent), roasting pits (5 percent), and mounded areas (5 percent).

Preclassic and Classic period habitation sites have been recorded along the Santa Cruz River floodplain. Upslope of these habitation sites are a series of artifact scatters with small rock piles and occasional hearths, ranging from 2750 to 3000 feet in elevation. These site locations coincide roughly with the modern distribution of dense cholla cacti in the Sonoran Desertscrub biome. Between 3,000 and 3,600 feet in elevation, there are no previously recorded sites, despite numerous prior surveys in that elevation range. Above this elevation, between 3,600 and 4,000 feet, the Semidesert Grassland includes relict stands of *Agave palmeri*. In this elevation zone, there are both Preclassic and Classic period habitation sites, some with trash mounds; more numerous are artifact scatters, some with field houses and roasting pit features.

Historic sites within a mile of the project area consist of mining related features (40 percent of historic sites), water diversion/storage features (13 percent), temporary camps (13 percent), and trash scatters with miscellaneous features (20 percent). Also apparent in the study area, although not currently defined as a site, is an electric transmission line that serves as the centerline of one of the project survey corridors. Records at the CNF office indicate that construction of this transmission line began in January 1942, a few short weeks after the bombing of Pearl Harbor, Hawaii.

**SURVEY RESULTS**

The cultural resource survey, conducted in support of the proposed project, identified 48 isolated occurrences (IO), 5 previously recorded sites, and 11 newly recorded sites.

Figure 3a through 3g depict the areas that were intensively inspected for cultural resources, as well as the results of the survey.
Figure 3c. Survey Results
Figure 3g. Survey Results
Previously Recorded but Not Relocated Site

The site was previously recorded as an on land managed by the CNF. The site was recorded by Bruce Huckell and others on December 17, 1980, for the Anamax – Rosemont project. In AZSITE, the site is plotted in the NE ¼ of Section 1, T19S, R15E, as depicted on the Sahuarita, AZ 7.5-minute USGS topographic quadrangle (see Figure 2f). The area was revisited by EPG during the Class III survey, but no cultural materials were found. After EPG's survey was completed, the site was relocated east of the current survey area by SWCA (Barr et al. 2010). It is currently considered to be eligible for listing on the NRHP by the CNF (William Gillespie, CNF, personal communication 2011).

Previously Recorded Sites in the APE

The site is located on land managed by the ASLD in the SW¼ of Section 3 and the SE¼ of Section 4, T18S, R14E, as depicted on the Sahuarita, AZ 7.5-minute USGS topographic quadrangle (see Figure 3b). UTM grid coordinates for the site are The site extends (Figure 4).

Previous Recordation

The site was previously recorded by Cynthia Buttery in 1986 as and . The observed by Buttery were noted to be found at the site (Buttery 1987).
Environmental Setting

The site is at an elevation of 2,985 feet, on a slope of the Santa Rita Mountains, where the vegetation in the site area consists predominantly of creosote bush, mesquite, cholla, prickly pear cactus, barrel cactus, wolfberry, ephedra, and various grasses. A utility line and a two-track service road cross the site.

Surface Observations

Surface survey of the site revealed similar to Buttery’s recording, though were recorded. Associated with the feature do not have (Photograph 4). Sediments associated with the three remaining features are darker than adjacent sediments, but no obvious charcoal was noted. We...
To document the artifact assemblage at this site, two observation units (OU) were established within the site boundaries; Table 5 describes the

<table>
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<th>Table 5. Observed in OUs at</th>
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</table>
Table 5. Observed in OUs

The observed in the OUs includes, with Cynthia Buttery also made note of them as compared to other materials types.

Table 6. Observed in OUs at

(Photograph 5). The remainder could not be further identified. These included (Photograph 6), and (Table 7). Observed by Buttery were not relocated.
Table 7. Observed at

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
<th>Measurements (cm)</th>
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One observation at the site suggests that subsurface deposits with intact cultural materials may be present.

Evidence of Site Age and Function

Rillito Red-on-brown and Rincon Red-on-brown ceramics were produced during the Rillito (AD 850 to AD 950) and Rincon (AD 950 to AD 1150) phases, respectively, indicating use of this site location during the late Colonial and Sedentary periods of the Hohokam Preclassic. The location of the site, as well as its diverse artifact assemblage, suggests the presence of Late Archaic contexts with examples occasionally appearing in assemblages as late as AD 300 (Justice 2002). The site could indicate prior use of the site during the Late Archaic Period, or it could be a relic dropped by subsequent users of the site.

National Register Recommendations

Although impacted by contexts that could yield analytical samples with the potential to provide information on the chronology and function of at this site by Archaic and/or Hohokam groups. It is therefore recommended that the site is eligible for listing on the NRHP under Criterion D.

Site

The site is located on land managed by the ASLD in the SW¼ of Section 3 and the SE¼ of Section 4, T18S, R14E, as depicted on the Sahuarita, AZ 7.5-minute USGS topographic quadrangle (see Figure 3b). UTM grid coordinates for the site are The site extends (Figure 5).
Previous Recordation

[Text removed]

Buttery also recorded (AC), (Buttery 1987).

Photograph 7.

Environmental Setting

The site is at an elevation of 2,995 feet, on a [Text removed] Vegetation in the area consists of mesquite, cholla, prickly pear cactus, barrel cactus, ephedra, creosote, and various weeds and grasses.
Figure 5. Site Map
Surface Observations

In 2010, EPG archaeologists revisited the site and expanded the boundary to the northeast. This expansion added of the site as previously recorded. It is the opinion of EPG archaeologists that this addition is a continuation of because of its location and similar artifact and feature assemblage. The previously recorded portion of the site appeared to be relatively unchanged, although the was not relocated and some of previously recorded were noted to . Surface survey found mostly .

The four features in the newly recorded portion of the site consist of a (Table 8), (Photograph 8). The boulder mortar were not present, so the .

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<th>Table 8.</th>
<th>Observed at</th>
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were recorded; each contained approximately. To document the site, were established within the previously unrecorded portion of the site and all artifacts in the OUs were tallied.

Table 9 lists the lithics observed in the . The observed consists mostly of , suggesting . In addition to the observed, were recorded in the . Because these could not be identified.
and the data are not presented in tabular format. A total of [redacted] were observed in [redacted], [redacted] were observed in [redacted], and [redacted] were observed in [redacted]. Outside OU boundaries, [redacted] of indeterminate form were recorded.

Table 9.

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<td>Photograph 8.</td>
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</table>
Evidence of Site Age and Function

The presence of [redacted] (noted during initial recordation) and [redacted] indicate use of the site area during the Snaketown phase (AD 700 to AD 800) of the Pioneer Period, as well as during the Rincon phase (AD 950 to AD 1150) of the Sedentary Period. The presence of [redacted] because of the site’s location with Buttery’s interpretation that this is a

National Register Recommendations

Although impacted by water and wind erosion, [redacted] has intact subsurface cultural materials, and the potential for datable samples from thermal feature contexts. Such information could provide important information for understanding the settlement and subsistence strategies of Hohokam inhabitants of the southern Tucson Basin during the Pioneer through Sedentary Periods. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site

The site is situated on [redacted] in the Santa Rita Mountains (Photograph 9). It is located on land managed by the CNF in the SW¼ of Section 17, and the E½ of Section 18, T19S, R16E, as depicted on the Empire Ranch, AZ 7.5-minute USGS topographic quadrangle (see Figure 3g). UTM grid coordinates for the site are [redacted]
The site extends (Figure 6).

Previous Recordation

sites. The site location’s legal description was not correctly written during initial recording of the site, but the correct location was recorded by CNF personnel in the 1980s (South 1982). CNF archaeologists Mary Farrell and William Gillespie revisited the site in 2005 and recorded it as a (Farrell et al., 2005). They noted.

Photograph 9. Overview of Site.
Environmental Setting

The site is at an elevation of 5,100 feet, on a portion of this site. Vegetation in the site area consists of various grasses, oak, walnut, willow, juniper, hackberry, cat claw acacia, Palmer’s agave, sotol, sagebrush, sacred datura, Arizona prickly poppy, buffalo gourd, and devil’s claw. *Agave palmeri* is naturally occurring in the area around the site, as well as regionally in areas above 3,800 feet in elevation. In addition, have been noted near this site (Photograph 10), growing outside their typical range. It is possible that

**Photograph 10.**

Surface Observations
map has been removed,

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**Table 10.**

**Photograph 11.**
None had temporally diagnostic characteristics. Some may be associated with historic ranching and/or prospecting related activities in the site vicinity.

The site are listed in Table 11.

Table 11.

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In addition to those inventoried in the report and are plotted on the site map. Diagnostic types observed were common during the Classic Period.
Table 12.

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inventoried at the site is described in Table 13.
Many observations at the site support the notion that

Evidence of Site Age and Function

The presence of  indicates at least intermittent use of the site area prior to

The  

If so, then this likely represents . An
There are also [REDACTED] in association with these features. These provide evidence that [REDACTED] occurred at the site. The [REDACTED] However, it is worth noting that

Presumably, if the

National Register Recommendations

Although impacted by mining activity, livestock grazing, and the construction and use of [REDACTED] has intact, subsurface cultural materials, and the potential for recovering information from analytical samples from [REDACTED] contexts is high. Such information could provide significant insights into the prehistoric settlement and subsistence patterns of Hohokam inhabitants of the Tucson Basin during the Preclassic and Classic Periods. It is therefore recommended that the site is eligible for listing on the NRHP under Criterion D.

Site

(Photograph 13).

Previous Recordation

(Seymour 1990). In 2005, Farrell and Gillespie revisited and

to be a
Environmental Setting

The site elevation ranges from 5,120 to 5,200 feet in elevation on the eastern slopes of the Santa Rita Mountains. It is situated

Vegetation at the site consists predominantly oak, juniper, various grasses, Arizona prickly poppy, buffalo gourd, Palmer’s agave, pig weed, acacia, and bear grass. During EPG’s recordation, and a

out of the site boundary.

Surface Observations
No historic artifacts were noted.

(Table 15).

to those currently growing at the site.

Table 15.

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Ultered mortar was found next to a single-room and is shown in Photograph 15.

Table 16.

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Only that there are subsurface deposits with intact cultural materials present.
Evidence of Site Age and Function

The lack of diagnostic painted wares makes dating of the site difficult, but the presence of ceramics dates the site from AD 200 to AD 1150. The [REDACTED] would date to the latter half of that range, approximately AD 600 to AD 1150. The [REDACTED] indicates use of this site location during the late Colonial and Sedentary periods of the Hohokam Preclassic. The presence of [REDACTED] indicates use of this site location during the late Colonial and Sedentary periods of the Hohokam Preclassic. The presence of [REDACTED]

National Register Recommendations

Although impacted by construction and use of the [REDACTED] It is likely that information-rich analytical samples can be recovered from numerous feature and non-feature contexts at the site. Analysis of such samples would potentially provide significant insights into the prehistoric settlement and subsistence strategies of Hohokam inhabitants of the area during the Preclassic and/or Classic Periods. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.
Newly Recorded Sites

Site (Photograph 16). The site is located on land managed by the ASLD in the

Environmental Setting

The site is at an elevation of 2,840 feet on an alluvial plain west of the Santa Rita Mountains. It is situated . Vegetation in the site area consists predominantly of creosote bush, mesquite, barrel cactus, cholla, and prickly pear cactus.

Photograph 16. Overview of Site.
Surface Observations

Surface survey of the site revealed (Photograph 17).
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<th>Photograph 18.</th>
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Image of Rosemont Project Site.
To document the artifact assemblage, all artifacts within the site boundary were recorded. A total of ( ). Table 19 lists these data are not displayed in tabular format.

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Evidence of Site Age and Function

Evidence for site age is limited, but the presence of ( ).

National Register Recommendations

This site has been impacted by cattle grazing and water erosion, and no evidence for sub-surface materials was observed in the ( ). It is not likely that ( ) has intact subsurface cultural materials outside of feature areas, and field observations suggest that the ( ). It is our recommendation that the site does not possess significant characteristics with integrity that would render it eligible for listing on the NRHP.

Site managed by the ASLD (Figure 9). The site is located in th (Photograph 119).
Environmental Setting

The site is at an elevation of 2,850 feet, on an alluvial plain. Vegetation in the site area consists predominantly of creosote bush and mesquite, with scattered cholla, prickly pear, barrel cactus, and saguaro cactus.

Surface Observations

Surface survey of the site revealed...
To document the artifact assemblage at this site, the boundaries were determined and all artifacts were flagged and recorded. A total deposits with cultural materials was observed.

Evidence of Site Age and Function

The only evidence of age for this site is the presence, which place the site temporally during the Ceramic period (AD 200 to AD 1500). The presence activities occurred here.
National Register Recommendations

That site has been impacted by cattle grazing and erosion, but [redacted] may have the potential to yield analytical samples from apparently intact deposits associated with [redacted]. Analysis of such samples could yield information on timing and use of the site that would contribute to our understanding of Hohokam subsistence strategies in the southern Tucson Basin. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site [redacted] (Photograph 21). The site is located on land managed by the ASLD in the [redacted] (Figure 10).

Photograph 21. Overview
Figure 10. Site Map
Environmental Setting

The site is at an elevation of 2,920 feet, on the flat alluvial plain. Vegetation in the site area consists of cholla, mesquite, ephedra, barrel cactus, prickly pear, wolfberry, saguaro cactus, and yucca. The site appears to be subject to erosion by sheet washing.

Surface Observations

Surface survey of the site revealed an artifact concentration (AC1) centered on the mounded area was investigated by placing an OU within its boundary.

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To document the artifact assemblage at this site, two OUs were established within the site boundaries and all artifacts were tallied. Table 21 lists the artifacts in the two OUs; listed in Table 22.

Represented in the were located at the site.

One observation at the site supports the notion that subsurface deposits with intact cultural materials may be present. The the site, a was highly disturbed by burrowing animals (Photograph 24). Within the back dirt piles adjacent to animal burrows,
Table 21.

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Evidence of Site Age and Function

The presence of [redacted] tentatively dates the site to the Rincon phase (AD 950 to AD 1150), indicating use of this site location during the Sedentary Period. The presence of diverse artifact types and the remains of a possible structure or trash mound suggest use of the area for habitation.

National Register Recommendation

Although impacted by some erosion and animal burrows, [redacted] appears to have intact, subsurface cultural materials with the potential to yield analytical samples. Analysis of such samples could yield information on timing and use of the site that would contribute to our understanding of Hohokam subsistence strategies in the southern Tucson Basin during the Sedentary Period. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site

in the Santa Rita Mountains (Photograph 25). Although the extends outside of CNF-managed lands, only the retains its integrity as a . Therefore, only that lying within CNF boundaries was recorded as a site.

The (Figure 11). The site begins in Section 9, T19S, R15E, and ends in Section

Environmental Setting

The is at an elevation of 4,360 feet; the a maximum altitude of 5,200 feet. The is situated in the highland plains east of the mountains near California Gulch. The road is lined with prickly pear cactus, barrel cactus, agave, yucca, ocotillo, cholla, cat claw acacia, tree acacia, mesquite, oak, juniper, and various grasses and weeds.
Surface Observations

The site is a...c... and related features... Surface survey of the site found a total of... within the survey corridor, while... the features in more detail. The... (Photograph 26).
### Table 23.

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<tr>
<th>Feature ID</th>
<th>Feature Type</th>
<th>Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Rock Outcrop</td>
<td>East</td>
<td>Located within the survey corridor.</td>
</tr>
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<td>2</td>
<td>Tree</td>
<td>West</td>
<td>Age: 100 years</td>
</tr>
<tr>
<td>3</td>
<td>Creek</td>
<td>South</td>
<td>Flowing water</td>
</tr>
<tr>
<td>4</td>
<td>Buried Object</td>
<td>North</td>
<td>Ancient pot</td>
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</table>
Features outside the Survey Corridor

There are...

Evidence of Site Age and Function


National Register Recommendations

We recommend that the site is eligible for listing on the NRHP under Criteria A and C. Criterion A is relevant, because this...

We also find the property has significance under Criterion C because the...

Site

(Photograph 29) that... The site is located on land managed by the CNF in the NW¼ of Section 12, T19S, R15E, as depicted on the Helvetia, AZ 7.5-minute USGS topographic quadrangle (see Figure 3f). (Figure 12).
Environmental Setting

The site is at an elevation of 4,800 feet, on the . The Vegetation in the site area consists predominantly of oak, juniper, mesquite, cat claw acacia, hedge hog cactus, and various grasses.

Surface Observations

Features of the
Table 24.
Evidence of Site Age and Function

The earliest activity at the site occurred in the [redacted] may also have occurred at the site.

National Register Recommendations

Although there has been some modern disturbance at the site in the form of modern camping and trash disposal, [redacted] has mostly intact surface remains. The many [redacted] in the Santa Rita Mountains. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.
Environmental Setting

The site is at an elevation of 3,790 feet, on a portion of the site. Vegetation in the site area consists predominantly of mesquite, scattered grasses, rabbit bush, cholla, prickly pear, and barrel cactus. Helvetia Road is less than 20 meters to the east.
Surface Observations

Surface survey of the site revealed (Photograph 34).

To document the artifact assemblage, the site boundaries were determined and artifacts were flagged and tallied. There were no formal tools observed at ). The artifact density was low and the assemblage consisted only of

The site appears to have subsurface deposits with intact cultural materials. Within the dark, organic sediment with artifacts was observed in the back dirt of animal burrows. This could indicate that there are intact cultural deposits at the site.
Evidence of Site Age and Function

The only evidence of age for this site is the plainware ceramics, which place the site temporally during the Ceramic Period (AD 200 to AD 1500). Site function may have included occasional
National Register Recommendations

Although impacted by some erosion and animal burrows, [redacted] appears to have intact, subsurface cultural materials with the potential to yield analytical samples. Analysis of such samples could yield information on timing and use of the site that would contribute to our understanding of Hohokam subsistence strategies in the southern Tucson Basin during the Ceramic periods. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site [redacted]

(Photograph 35). The site is located on land managed by the ASLD in the

(Figure 14).

Photograph 35. Overview of Site [redacted].
Environmental Setting

The site is at an elevation of 3,790 feet, and is situated on a Vegetation in the site area consists predominantly of mesquite, scattered barrel and prickly pear cactus, rabbit bush, and various grasses.

Surface Observations

Surface survey of the site revealed an is listed in Table 27.

Table 26.

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Represented in the (Photograph 36), For
Evidence of Site Age and Function

Rincon Red-on-brown ceramics were produced during the Rincon phase (AD 950 to AD 1150), indicating use of this site location during the Sedentary Period of the Hohokam Preclassic. The tentatively suggest that this site represents

National Register Recommendations

Impacted by cattle grazing and especially erosion, there are no intact, subsurface cultural materials, and no features were observed. It is, therefore, unlikely that the site would yield additional information beyond the surface recordation that would provide information for understanding the history of inhabitants of the area. As a result, EPG recommends that the site is not eligible for listing on the NRHP.
Site (Photograph 37). The site is located on land managed by the ASLD in the (Figure 15).

Photograph 37. Overview of Site
Environmental Setting

The site is at an elevation of 3,980 feet, on an alluvial plain below the Santa Rita Mountains. It is situated [ ] . Vegetation in the site area consists predominantly of mesquite, prickly pear, cholla, stickweed, and various grasses. A

Surface Observations

Surface survey of the site did not reveal any features, but [ ] .

Table 29.

Photograph 38. Overview of [ ] .
One observation at the site suggests that subsurface deposits with intact cultural materials may be present. A

Evidence of Site Age and Function

The presence of red-on-brown ceramics indicates Hohokam use of the site during the Colonial and Sedentary periods (AD 850 and AD 1150). The artifact types suggest that this site represents
National Register Recommendations

Although impacted by cattle grazing, erosion, and the [redacted] appears to have intact, subsurface cultural materials with the potential to yield analytical samples. Analysis of such samples could yield information on timing and use of the site that would contribute to our understanding of Hohokam subsistence strategies in the southern Tucson Basin during the late Colonial and/or Sedentary periods. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site of the Santa Rita Mountains (Photograph 39). The site is located on land managed by the ASLD in the SW¼ of Section [redacted] (Figure 16).

Photograph 39. Overview of Site
Figure 16. Site Map
Environmental Setting

The site is at an elevation of 3,680 feet, on the Santa Rita Mountains. The site is situated

Vegetation in the site area consists predominantly of mesquite, with cholla, ephedra, prickly pear, palo verde, wolfberry, barrel cactus, and various grasses.

Surface Observations

Surface survey of the site revealed

Dark-stained sediments artifacts were observed in a rodent burrow in the mound, which may

To document the artifact assemblage at this site, the boundaries were located and all of the artifacts were flagged and counted. A total of
Table 30. No were identified at the site.

Table 30. 

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At the site have evidence for subsurface deposits with intact cultural materials. The has been disturbed by animal burrowing (Photograph 41). Dark-stained sediments and .

Photograph 41.
Evidence of Site Age and Function

The presence of red-on-brown ceramics indicates the site may have been used during the Colonial or Sedentary periods (AD 850 and AD 1150). If the site is, in fact, as old as the ceramics suggest, the lack of functionally diagnostic tools in the observed surface assemblage precludes an informed assessment of site function, but we suspect resource acquisition and processing activities may have occurred here.

National Register Recommendations

Although impacted by erosion, and the site appears to have intact, subsurface cultural materials from feature contexts with the potential to yield analytical samples. Analysis of such samples could yield information on timing and use of the site that would contribute to our understanding of Hohokam subsistence strategies in the southern Tucson Basin during the late Colonial and/or Sedentary periods. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.

Site (Figure 17). The site is located on land managed by the BLM in the [illegible] (Photograph 42).

Environmental Setting

The site is at an elevation of 4,200 feet, on the [illegible] the Santa Rita Mountains. Vegetation in the site area consists predominantly of mesquite, cholla, pencil cholla, prickly pear cactus, ocotillo, cat claw acacia, arrow cactus, and ephedra. A [illegible]
Surface Observations

Surface survey of the site revealed a limited artifact assemblage. The artifact assemblage was mostly non-functional materials. No formal tools were observed at the site. To document the artifact assemblage, one OU was placed in the center of the site and a tally was taken of all the artifacts within it. Table 31 recorded within OU1.

Represented in the artifact assemblage are non-functional materials at the site, and these are not presented in tabular form. The most abundant materials at the site are likely to be from the historic town site of Helvetia.

The artifact count at the site is limited and there is no evidence of subsurface materials even in the immediate vicinity of the site. Although the site does not appear to be heavily disturbed, its proximity to the historic town site of Helvetia
and the presence of mining activity within the site boundary raise the possibility that the site may have been disturbed or looted.

Evidence of Site Age and Function

Evidence was limited, but the presence of red-on-brown ceramics indicates Hohokam use of the site during the Colonial and Sedentary periods (AD 850 and AD 1150). The small number of artifacts and low diversity of artifact types suggests a limited range of activities and infrequent use of the site. Given the nature of the artifact assemblage and lack of surface features at [redacted], it is not possible to make an accurate assessment of site age or function.

National Register Recommendations

Impacted by especially [redacted] the site suggest there are no intact, subsurface cultural materials, and no features were observed. It is therefore unlikely that the site would yield additional information beyond the surface recordation that would provide information for understanding the history of inhabitants of the area. As a result, EPG recommends that the site is not eligible for listing on the NRHP.
Environmental Setting

The site is at an elevation of 5,225 feet, on

Vegetation at the site consists of oak, juniper trees, buck wheat, cat claw acacia, Arizona prickly poppy, rabbit bush, yucca, tree acacia, devil’s claw, and various grasses.
Figure 18. Site Map
Surface Observations

Surface survey of the site revealed (Photograph 43), There were no formal tools observed at observed is listed in Table 32.

<table>
<thead>
<tr>
<th>Table 32.</th>
</tr>
</thead>
<tbody>
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</table>

Evidence of Site Age and Function

The age of the site could not be definitively determined, but the use during the Classic Period or later (post-AD 1150). Judging from the paucity of artifactual remains at the site, the Although they are located outside the site boundaries, right have been for the landscape: the

National Register Recommendations

Site that has a potential for limited subsurface cultural materials. Although the has been impacted by some erosion, there does appear to be intact deposits that could yield analytical samples. Information obtained from such samples could provide information that would contribute to our understanding of agricultural strategies in the southern Tucson Basin during the Classic Period. It is, therefore, recommended that the site is eligible for listing on the NRHP under Criterion D.
Isolated Occurrences Recorded in the APE

In addition to the sites recorded or revisited during survey, were also recorded (Table 33). It is important to note that these isolates do not meet ASM criteria for definition as a site. Some of the IOs may appear to qualify as sites based on number and type of artifacts; however, these were dispersed over too large an area to be considered sites. The recording of these items essentially exhausts their research potential, and no further consideration of these materials is needed. The locations of diagnostic IOs recorded during survey are shown, along with the locations of sites, on Figures 3a through Figure 3g. Isolated occurrences recorded during survey are described in more detail below.

Table 33.
Prehistoric Isolates

During the survey, crews recorded the locations of features during the survey, despite the lack of associated artifacts. These consisted of features. No charcoal or ash was noted at these features.
The remaining  and were not dense or diverse enough to meet ASM criteria to be defined as sites. A total of

recorded in the field consisted only of ). The isolated occurrences, with a total of . The

Historic Isolates

A total of . These consist of

ANALYSIS OF RESEARCH RESULTS

Potential Research Themes

Potential research themes we identified that could be illuminated through intensive pedestrian

survey in the project area included land use practices, prehistoric settlement patterns, and

economic interaction. While we treat these as distinct research themes, they are intricately

interrelated; the analytical results of each are critical for evaluating the other themes.

Land Use

The locations of small prehistoric sites in the project vicinity are patterned according to elevation

and may reflect the prehistoric distributions of resources. Because this was a non-collection, non-

excavation project, we did not recover or analyze in situ plant or animal remains from sites

identified during survey. Nevertheless, the types of features and tools found at a site provide

information on the kinds of resources that may have been acquired and/or processed in the past.

For this research theme, we examined feature and tool types from small upland versus small

lowland sites in the project area to assess the extent to which this reflected different land use

strategies. Table 34 provides a breakdown by elevation range for features types identified during

surveys that contribute toward an understanding of land use strategies. The tabular data are

displayed graphically in Figure 19.
Table 34.

Figure 19. Proportions of Feature Types Recovered in Different Elevation Zones.

At sites and isolated occurrences in 3,000 and 3,600 feet, no features are present.
The features types that were found in association with these different feature types provide additional information on past land use practices. Table 35 provides a breakdown by elevation range for features types identified during surveys that contribute toward an understanding of land use strategies. The tabular tool data are displayed graphically in Figure 20.

**Table 35.**

<table>
<thead>
<tr>
<th>Elevation Range</th>
<th>Feature Type 1</th>
<th>Feature Type 2</th>
<th>Feature Type 3</th>
<th>Feature Type 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 - 3,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,000 - 4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4,000 - 5,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5,000 - 6,000</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>6,000 - 7,000</td>
<td></td>
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<tr>
<td>7,000 - 8,000</td>
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<td>8,000 - 9,000</td>
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<tr>
<td>9,000 - 10,000</td>
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</table>

When feature and tool types are considered together, past land use strategies by elevation zone can be proposed. Cholla, abundant in this elevation zone, was an important resource. New growth buds and fruit from this plant can be harvested in late spring. Two other abundant foods in this lower elevation zone known to be ethnobotanically important are the pods and seeds from mesquite and palo verde trees. The *Agave* is abundant at elevations above 3,600 feet, and the
Previously recorded sites in the project vicinity suggested that there may be patterning in the location of large habitation sites and smaller resource processing sites. To assess whether there are discernible patterns in the relative locations of potentially contemporary sites, we identified temporally diagnostic materials to assign chronological designators to sites and isolated occurrences, and used feature types and artifact assemblages to generate an understanding of site function. These data were combined with survey results obtained by EPG in the fall of 2009 during a survey that covered a similar sized area 1.5 miles north and parallel to the current linear project (Sheehan et al., 2010). The previous discussion of evidence for land use indicated that there is evidence for differing suites of features and tools in different elevation zones that likely reflects targeting of different resources available in those elevation ranges. Did this resource exploitation pattern vary over time?

Table 36 provides information on the temporal association of sites and isolated occurrences in the different elevation zones examined as part of this project. As indicated in the table, there was active use of both low and high elevation settings throughout prehistoric times, but no evidence for use of the intervening, mid-elevation grassland/desertscrub areas.
Table 36. Temporal Aspects of Settlement and Land Use

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Archaic</th>
<th>Preclassic</th>
<th>Classic</th>
<th>Aceramic</th>
<th>Ceramic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 3600 ft</td>
<td>1</td>
<td>14</td>
<td>2</td>
<td>23</td>
<td>13</td>
<td>53</td>
</tr>
<tr>
<td>3000 - 3600 ft</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>&lt; 3000 ft</td>
<td>3</td>
<td>14</td>
<td>1</td>
<td>7</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td>28</td>
<td>3</td>
<td>30</td>
<td>33</td>
<td>98</td>
</tr>
</tbody>
</table>

Economic Interaction

Previously recorded sites in the area include large Preclassic and Classic period habitation sites, with some situated along the Santa Cruz River floodplain below 3,000 feet in elevation, and others at the upper end of the bajada above 4,000 feet in elevation. As discussed above, material remains in different elevation settings reflect different patterns of resource exploitation. Did occupation and use of different resource areas influence the extent to which site inhabitants in low and high elevation settings were able to be engaged in distant economic interactions, and thus, their degree of integration into larger Southwest exchange networks? More specifically, did use of upland areas for exploitation of agave involve a trade-off in terms of access to exotic trade goods? To address this research question we identified whether exotic items (i.e., non-local pottery and non-local shell) were less frequent at high elevation versus low elevation habitation sites. For this study we defined habitation sites as those containing evidence for multiple contiguous surface rooms or having evidence for subsurface rooms as well as extensive surface trash. The resulting data are shown in Table 37.

Table 37. Evidence for Economic Interaction at Habitation Sites

<table>
<thead>
<tr>
<th>ASM #</th>
<th>Nonlocal Ceramics</th>
<th>Glycimeris Shell</th>
<th>Time Period</th>
<th>Elevation (ft)</th>
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</table>

The data recorded in the area by EPG indicate that there are these sites are located in low elevation settings below 3,000 feet, none is located in mid-elevation settings between 3,000 and 3,600 feet, and located in high elevation settings above 3,600 feet.
in high elevation settings, and were actually more ubiquitous than for habitation sites in low elevation settings. We infer that occupation and use of resource areas in high elevation settings away from rivers did not reduce the extent to which site inhabitants were able to be engaged in distant economic interactions, and thus, their degree of integration into larger Southwest exchange networks.

Conclusions

An examination of sites and isolated occurrences in the different elevation zones examined as part of this project over time shows that there was use of low and high elevation settings throughout prehistoric times, from the Archaic through the Classic Period, but no evidence for use of mid-elevation grassland/desertscrub areas. Features and tools found in low versus high elevation settings reflect different resource exploitation patterns: low elevation features and tool assemblages are consistent with processing of cactus and seeds that are abundant in this area. Features and tools recorded in high elevation ranges are consistent with the cultivation and processing of agave, which is abundant in high elevation areas. Despite the fact that habitation sites in high elevation areas targeting agave resources were situated far from riverine settings, evidence suggests that inhabitants of these sites were able to acquire distant resources through trade networks.

RECOMMENDATIONS

Five previously recorded sites occur in the APE of the proposed project. The eligibility status of these sites was not evaluated during previous recordings. These sites were revisited and assessed for their eligibility during the field survey. Two previously recorded sites are present at this site, therefore, it is recommended not eligible for listing on the National Register of Historic Places (NRHP). The other four previously recorded sites are recommended eligible for listing on the NRHP under Criterion D, for their potential to provide information on the subsistence strategies of prehistoric populations in the southern Tucson Basin area.

Three newly identified sites were recorded during the Class III survey. Two of these sites are recommended eligible for listing on the NRHP under Criterion D for their information potential; one site is recommended eligible for listing on the NRHP under Criterion A, as it is associated with events that have made a significant contribution to broad patterns of our history and under Criterion C, because it embodies distinctive characteristics of a type, period, or method of construction; and three sites are recommended not eligible for listing on the NRHP.

For the proposed project, it is possible that adverse effects to sites eligible for listing on the NRHP under Criterion D (or contributing components thereof) can be avoided through selective tower placement. In these instances, it is our recommendation that those eligible historic properties be barricaded prior to construction, and that an archaeological monitor be present for avoidance monitoring when construction occurs within 100 feet of the sites. If these sites can be avoided by the proposed project, we recommend a finding of no adverse effect to the historic properties. If these sites cannot be avoided by the project, we anticipate that the project will have an adverse effect to the historic properties. In order to mitigate the
adverse effects the proposed project would have on the historic properties, a treatment plan would need to be developed in consultation with the Arizona State Land Department and the Arizona State Historic Preservation Office.

For the site eligible for listing on the NRHP under Criteria A and C, construction of modern utility lines could have adverse effects to the visual integrity of the site. Potential adverse effects to this property would need to be mitigated through implementation of a treatment plan developed in consultation with the CNF and Arizona SHPO.

There were isolated occurrences (cultural materials that do not meet criteria established by ASM for classification as a historic property) found during the Class III survey. Because none of these occurrences meets the definitions of an archaeological site or other historic property, none is eligible for listing on the NRHP.

In the event human remains or funerary objects are discovered during construction of the proposed project, all work in the area should cease and the finding(s) be reported to either the director of the ASM or designee in accordance with Arizona Revised Statutes § 41-844 and § 41-865.
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