APPENDIX E. CLASS III CULTURAL RESOURCES SURVEY REPORT AND CULTURAL RESOURCES CORRESPONDENCE

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A Class III Cultural Resources Survey for a Proposed Buried Telecommunications Fiber-Optic Line near Winterhaven, in Imperial County, California

Prepared by:
Joseph Howell, M.A.

Tierra Archaeological Report No. 2014-141
Tierra Job No. 13T0-337
March 2, 2015 (revised)

A Class III Cultural Resources Survey for a Proposed Buried Telecommunications Fiber-Optic Line near Winterhaven, in Imperial County, California

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ABSTRACT

PROJECT TITLE:	A Class III Cultural Resource Survey for a Proposed Buried Telecommunications Fiber-Optic Line, in Imperial County, California
LAND STATUS:	Fort Yuma–Quechan Indian Reservation, Imperial County, private, Bureau of Reclamation (BOR)
AGENCY:	Bureau of Indian Affairs (BIA), Fort Yuma–Quechan Indian Reservation, BOR
PROJECT DESCRIPTION:	A Class III cultural resources survey of approximately 26.46 linear km (16.44 linear miles) was conducted in anticipation of a proposed buried fiber-optic telecommunications line installation.
TIERRA PROJECT NO.:	13T0-337
TIERRA REPORT NO.:	2014-141
DATES OF FIELDWORK:	July 15 and 16, 2014
PROJECT LOCATION:	The project area is located in Sections 31, 32, and 33 of Township 15 South, Range 23 East; Sections 11–14 and 21–27 of Township 16 South, Range 22 East; and Sections 4–9, 18, and 19 of Township 16 South, Range 23 East, San Bernardino Baseline and Meridian, on the Bard (1965), Yuma East (1965), Yuma West (1965; photorevised 1979), and Araz (1964, photoinspected 1973) 7.5-minute U.S. Geological Survey (USGS) quadrangles, in Imperial County, California.
AREA SURVEYED:	Approximately 199.3 acres (80.6 ha)
NO. OF SITES RECOMMENDED AS NRHP ELIGIBLE:	6
NO. OF ISOLATED OCCURRENCES:	10
MANAGEMENT RECOMMENDATIONS:	Six sites, ten isolated occurrences, and one modern cemetery were encountered during the current survey. Four of the sites consist of historic canals that remain in active use. The other two sites consist of the historic Pilot Knob-Tap Drop 4 161kV Transmission Line and

the historic route of the Southern Pacific Railroad. It is anticipated that the canals, transmission line, and railroad will remain unaffected by the proposed construction activities, and, therefore, there will be No Adverse Effect to these resources. Tierra recommends that the proposed undertaking be allowed to proceed; however, monitoring by a qualified archaeologist and/or Tribal member is recommended during construction work in the vicinity of the Fort Yuma–Quechan Indian Reservation Cemetery.

The clients and all subcontractors are reminded that if human remains or funerary objects are uncovered during future ground-disturbing activities, California Environmental Quality Act (CEQA) Statute 15064.5(e) requires that all work must be stopped in the area of discovery and that the coroner of the County in which the remains are discovered be contacted to determine that no investigation into the cause of death is required. If the discovery is on Indian land and the coroner determines the remains to be Native American, the Quechan Tribe shall be notified immediately to make arrangements for the disposition of the remains. If not on Indian land, the coroner shall contact the Native American Heritage Commission, which will identify the person or persons it believes to be the most likely descendents of the deceased Native American. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work as to the means of treating or disposing of the human remains and any associated grave goods with appropriate dignity, as provided in Public Resources Code Section 5097.98.

INTRODUCTION

At the request of Nate Stanislawski of TDS Telecommunications Corporation (TDS), Tierra Right of Way Services, Ltd. (Tierra), performed a Class III cultural resources survey of approximately 26.46 linear km (16.44 linear miles) in anticipation of the replacement of buried fiber-optic telecommunications lines on the Fort Yuma–Quechan Indian Reservation and on unincorporated land in Imperial County, California. TDS is proposing to upgrade their existing network using California Advanced Services Fund (CASF) funds. Because the project is a public utility, it falls under the regulation of the California Public Utilities Commission (CPUC). The Bureau of Indian Affairs (BIA) will be approached to approve a grant of easement for right-of-way across the reservation and is the lead reviewing agency for the cultural resources component of the project; as such, the project is subject to the regulatory guidelines established by the National Environmental Policy Act (NEPA) and by Section 106 of the National Historic Preservation Act (NHPA) of 1966. The BIA Western Regional Office determined that an Archeological Resources Protection Act (ARPA) permit was not necessary for the non-collection/non-excavation survey (McVey 2014).

The project, as proposed, will consist of the installation of new fiber-optic cable and 10 nodes. The project will extend high-speed internet service to the communities of Winterhaven, Bard, and surrounding areas on the Fort Yuma–Quechan Indian Reservation. Because the fiber-optic project is being permitted through the CPUC, the survey was conducted according to the environmental permitting guidelines for cultural resources mandated by the California Environmental Quality Act (CEQA) (California Public Resources Code 21000–21177). In addition to the CPUC and BIA, the Bureau of Reclamation (BOR) and Imperial County are also participating regulatory agencies. The proposed route of the telecommunications line will cross (via horizontal directional boring) several canals administered by the BOR and is located within the Reservation Division of the Yuma Project, which is administered by the BOR and the Bard Water District. Because part of its length follows portions of Picacho and Ross Roads, Imperial County has been included as a participatory agency.

Of the total fiber-optic line, about 13.98 km (8.68 miles) will be installed on Tribal land, and 12.48 km (7.75 miles) will be installed on lands within unincorporated Imperial County, including the settlements of Winterhaven and Bard.

The survey was conducted by Joseph Howell, M.A. (field director), and Ben Wright (field technician), on July 15 and 16, 2014. Henri Koteen served as Tribal monitor. A total of four person-field-days was required to complete the survey. Barbara K. Montgomery, Ph.D., was principal investigator for the project. Renee Darling served as project manager through September 2014. Tom Euler took over as project manager in October 2014.

THE PROJECT AREA

The project area, or area of potential effects (APE), consists of approximately 26.46 linear km (16.44 linear miles) of buried utility corridors. Previously installed utilities, in the form of copper telephone cable and other utilities, already exist within the corridors. However, fiber-optic line has not been previously installed in any of the corridors, and all trenches excavated within the APE will be new. The plow insertion of the fiber-optic lines requires trenches measuring between 1 and 2 feet (0.3 to 0.6 m) in width, and 4 feet (1.2 m) in depth. Roughly half of the APE is located on the Fort Yuma–Quechan Indian Reservation, with the remainder located on unincorporated Imperial County land east of the reservation. A small portion is located within the town of Winterhaven, California.

The width of the APE, which corresponds to the surveyed area, was 30 m (98 feet). In total, the project area was approximately 80.6 ha (199.3 acres). The project area is located in Sections 31, 32, and 33 of Township 15 South, Range 23 East; Sections 11–14 and 21–27 of Township 16 South, Range 22 East; and Sections 4–9, 18, and 19 of Township 16 South, Range 23 East, San Bernardino Baseline and Meridian (SBB&M), on the Bard (1965), Yuma East (1965), Yuma West (1965; photorevised 1979), and Araz (1964, photoinspected 1973) 7.5-minute U.S. Geological Survey (USGS) quadrangles, in Imperial County, California (Figure 1).

The utility corridors follow existing roads, and the majority are located between road shoulders and cultivated fields. The major roads paralleled by the project corridor/APE include Picacho Road, Arnold Road (Photos 1 and 2), First Avenue (Photo 3), Cocopah Road (Photo 4), Perez Road (Photos 5 and 6), Ross Road (Photo 7), Bard Road (Photo 8), Fisher Road (Photo 9), Avenue E, Haughtelin Road (Photo 10), and Stalnacker Road (Photo 11). Short segments also exist along Quechan Drive, Parkman Road (Photo 12), E Street (in Winterhaven) (Photo 13), and Railroad Avenue (also in Winterhaven). In a few locations, the APE runs past private residences or businesses. Most of the surface area of the 30-m-wide (98-foot-wide) corridor is covered by asphalt, extends into cultivated areas, and has been leveled and graded during road construction. The leveled and graded areas consist of open raw land. However, several roads are unpaved (e.g., Haughtelin, Perez, and Fisher Roads), which allowed for a more extensive examination than areas where only raw land was visible. Except for cultivated plants in the fields (e.g., cotton [*Gossypium* sp.], maize *[Zea mays]*, and Sudangrass *[Sorghum x drumondii]*) and riparian species near canal crossings, little vegetation was noted within the APE.

The environment of the APE is dominated by intensively cultivated land on an alluvial plain of the Colorado River. This flat, open surface is part of the larger Salton Trough landform that includes the Imperial, Coachella, and Mexicali Valleys. The Salton Trough is a physical remnant of Lake Cahuilla, a large prehistoric freshwater lake that reached a maximum extent of 161 km (100 miles) long by 56 km (35 miles) wide, and extended from the Colorado River delta to the vicinity of Indio (Heuberger n.d.:17–18; Singer 2014). Much of the fertile agricultural land of the Imperial and Coachella Valleys is the result of silts deposited in Lake Cahuilla by the Colorado River, which flowed into it for many centuries. Soils within the project area include Gadsden clay, Glenbar silty clay loam, Holtville clay, Indio silt loam, Kofa clay, Lagunita loamy sand, Lagunita silt loam, and Ripley silt loam (USDA 2014). Detailed descriptions of these soil types can be seen in Appendix A.

CULTURE HISTORY

Cultural resource surveys conducted during the past two decades have shed new light on the settlement patterns of southeastern California and southwestern Arizona. Sites in the region have traditionally been thought of as ephemeral, shallow deposits consisting of cleared areas in the desert pavement (sleeping circles), trails, trail markers, rock rings, intaglios, and sparse artifact scatters (Hartmann 1986). Relatively few subsurface investigations have taken place, leaving many research questions unanswered. This section presents an overview of the major themes in prehistoric, protohistoric, and historic cultural patterns in the Colorado River region of southwestern North America.

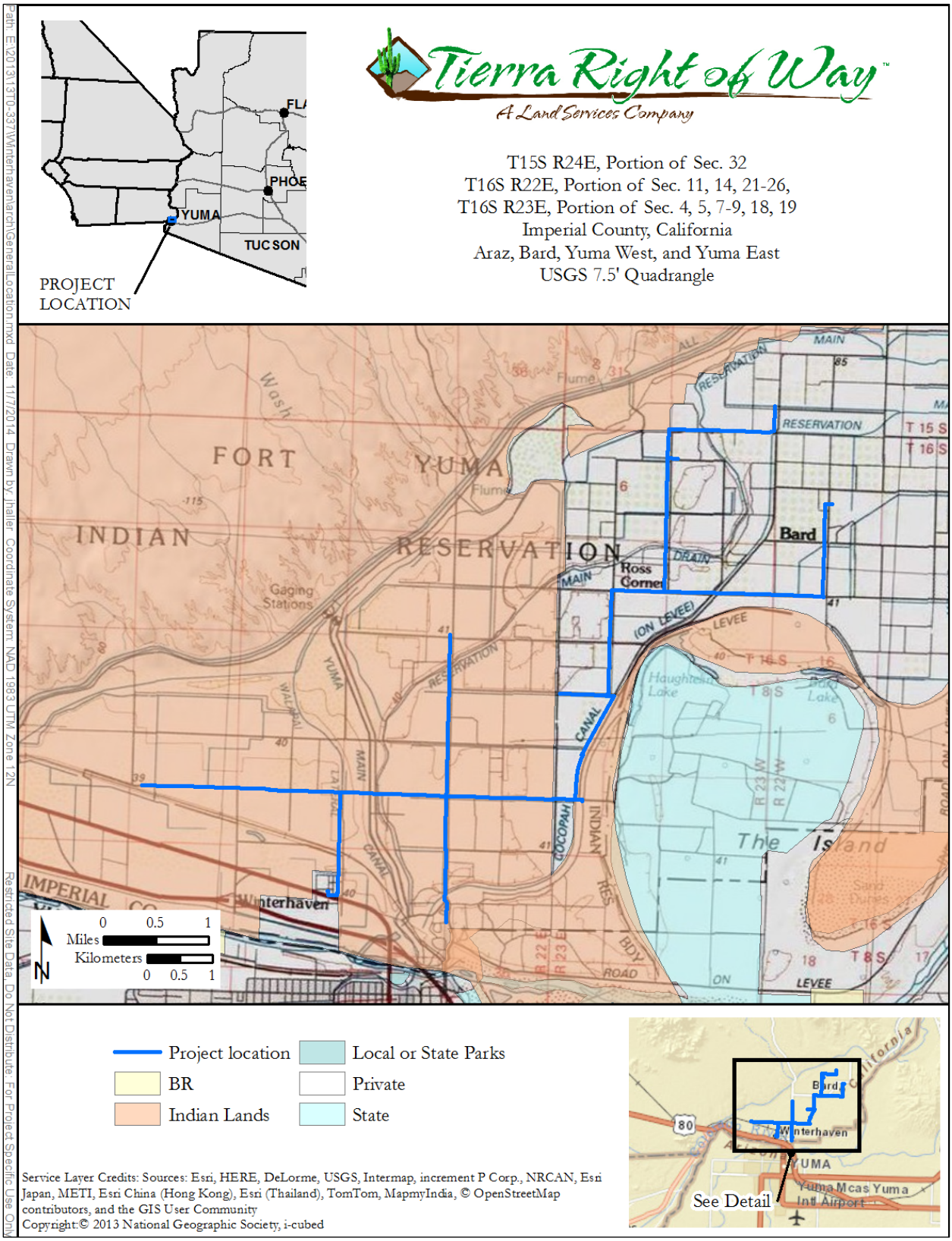


Figure 1. Location of the APE.

Photo 1. Arnold Road, from Picacho Road intersection. View is to the west.

Photo 2. Arnold Road, from westernmost end of APE. View is to the east.

Photo 3. First Avenue, from E Street intersection in Winterhaven. View is to the north.

Photo 4. Cocopah Road. View is to the north-northeast.

Photo 5. Perez Road. View is to the north.

Photo 6. Perez Road, from junction with Ross Road. View is to the south.

Photo 7. Ross Road, from Flood/Cocopah Road intersection. View is to the west.

Photo 8. Bard Road, from Whitmore Road intersection. View is to the south.

Photo 9. Fisher Road, from Hoppe Road intersection. View is to the north.

Photo 10. Haughtelin Road, from Perez Road intersection. View is to the west.

Photo 11. Stalnacker Road. View is to the east.

Photo 12. Parkman Road. View is to the east.

Photo 13. E Street, Winterhaven. View is to the west.

Paleoindian Adaptations (11,300–8,500 B.C.)

Although there may have been an earlier human presence in North America (cf. Wisner 1997), the earliest securely dated occupation of the southwestern United States was by nomadic bands of hunters collectively referred to as Paleoindians. In the classic formulation (cf. Willey and Phillips 1958), between roughly 13,000–8,000 B.P., a succession of discrete Paleoindian cultures, distinguished in part by their use of distinctive types of projectile point suited to the hunting of particular game species, roamed over broad areas in pursuit of wide-ranging herds of generally large game, although smaller species and plant resources were used as well (Cordell 1984). What is apparently the earliest of these cultures, the Clovis culture, used a bifacial lanceolate point, fluted on both sides and with a concave base; it is perhaps the most distinctive pre-ceramic artifact in the Americas (Hester 1972; Irwin-Williams 1979). Clovis peoples ranged widely over the Americas (Clovis points have been found in situ as far south as Chile), but the vast majority of Clovis sites are located in North America, south of a line (the Mason-Quimby Line) marking the limit of terminal Pleistocene glaciation. The Clovis culture is known largely from excavations conducted at "kill sites" such as Blackwater Draw (Hester 1972) in eastern New Mexico and Naco (Haury 1953), Lehner (Haury and others 1959), and Murray Springs (Haynes 1970) in the San Pedro Valley of southeastern Arizona. Clovis points have been found in association with the remains of many species, including now-extinct forms of elephant, horse, camel, and other species that populated the grasslands of the Southwest (Huckell 1984), but it is their association with mammoth bones that first singled these points out as being extremely old. The Clovis occupation has most recently been dated to a very narrow window of time, between 11,050 and 10,800 *radiocarbon* years B.P. (tentatively interpreted as translating to an actual span between 11,300 and 10,850 B.C.; Waters and Stafford 2007).

Mammoth died out in North America around the same time as the Clovis occupation, and other types of megafauna followed in fairly short order. It was once widely believed (cf. Martin 1967)—and is still thought possible by some (cf. Haynes and Eiselt 1998; Steadman et al 2005)—that these terminal Pleistocene extinctions were caused wholly or partly by "overkill." It was supposed that Clovis hunters came to the Americas from Asia and immediately began to efficiently obliterate an animal population that had not evolved to fear human hunters, driving the least adaptable creatures to extinction in a very short time. Most now believe that the extinction happened instead because of environmental change (Grayson and Meltzer 2003; Guthrie 2006), although several different mechanisms have been proposed by which this might have taken place.

Whether Clovis hunters were the cause of the extinction or not, hunters did stop using Clovis points when mammoths went extinct. In some areas of the Southwest, the Clovis culture appears to have been more or less directly succeeded by another tradition that made use of fluted projectile points known as the Folsom culture. However, virtually no remains associated with this or other post-Clovis Paleoindian groups have been documented in central Arizona (Reid and Whittlesey 1997). One explanation that has been suggested is that with the end of the Pleistocene era and the onset of the notably wetter Early Holocene, the broad expanses of parkland across which large-game species once roamed were broken up by wet patches that the animals could not cross, rendering a Paleoindian lifeway unsustainable in this part of the Southwest. It has been speculated that the descendants of the Paleoindian hunters might have migrated northward to the Great Plains, where appropriate conditions persisted until as late as 5000 B.C.

It is against this backdrop of early human activity in North America that the San Dieguito Complex was formulated. This model was proposed as the local variation on the Clovis and later cultures in southern California and southwestern Arizona.

The San Dieguito Complex

The San Dieguito complex was first identified in San Diego County, California, in the 1920s by archaeologist Malcolm Rogers. It is certainly one of considerable antiquity. Some researchers (cf. Hayden 1976) have speculated that the roots of this tradition date back as far as 30,000–40,000 B.C., but in truth very few radiocarbon or other absolute dates have been obtained for this tradition. Instead, there has long been a dependence on the notion that San Dieguito artifacts simply look older than others based on the degree to which artifacts have acquired a glossy "desert varnish," which is produced by exposure to wind, sun, and biological processes. Unfortunately, efforts to place dating through desert varnish on a scientific basis have failed, and at present, there is still no viable means for dating the typical San Dieguito site. San Dieguito artifact assemblages are generally distinguished by the presence of large, crude, desert-varnished scrapers, scraper planes, and choppers, which, in the opinion of some researchers, were best suited for the processing of wood and similar materials rather than foodstuffs. However, assemblages also include heavy, apparently highly specialized projectile points and other tools characterized by the complete removal of cortex from the initial blank (Robbins-Wade 2003), in some cases with the apparent intention of producing plano-convex artifacts (i.e., having one side intentionally flattened and the other left bulging) that could be further refined into specialized tools (Rogers 1966). Percussion flaking was utilized to the virtual exclusion of pressure flaking, at least through the earlier parts of the San Dieguito sequence. Felsite, a mineral with notably good flaking characteristics, is a preferred raw material for the more finely worked artifacts in San Dieguito assemblages. Features typical of San Dieguito sites include "sleeping circles," roughly circular areas several meters across from which desert pavement has

apparently been raked away; trails and cobble shrines adjacent to them used perhaps as route markers or for ceremonial purposes; and rock alignments of uncertain purpose.

Rogers (1939) initially laid out a three-phase sequence for the San Dieguito, the earliest phase being labeled Malpais, followed by the Playa I and Playa II phases. He later renamed these three phases San Dieguito I, II, and III (see Rogers 1966:27–29 for a discussion of the historical development of the San Dieguito nomenclature). Unfortunately, because of the relative simplicity of these sites, the lack of dates, and the general lack of consensus as to what was going on, researchers have tended to fly off in many different directions when trying to evaluate the place and significance of this complex. Hayden (1976) decided, based largely on findings of shell which he dated to 37,000 B.C. (a date derived, perhaps, from a misinterpretation of the manner in which desert-paved surfaces are formed), added a fourth phase to the beginning of the sequence, reusing the term "Malpais" to describe it. Because of the general similarity between Hayden's Malpais sites and what Rogers originally labeled Malpais, this choice has contributed heavily to the confusion. The principal difference between Hayden's Malpais and San Dieguito I is the appearance of great age and the fact that a number of Hayden's Malpais sites had, along with the normal San Dieguito I assortment of features, earth figures (intaglios) in association. These features are, like sleeping circles, made by raking gravels from parts of a desert-paved surface. In the case of intaglios, however, this was done in order to produce large-scale artistic designs visible from above. While Hayden was clear in stating that Malpais was merely the oldest manifestation of the San Dieguito complex (going back perhaps somewhat farther than conventional archaeological sequences), later researchers have cited his work as support for an "Early Man" presence in the Southwest going back perhaps hundreds of thousands of years. Hayden's concept of a Malpais tradition has suffered from the backlash generated by these assertions. Many have chosen to discount the existence of this phase entirely, and it is doubtful, in any case, if this represents any sort of loss to interpretation, given the similarities between Malpais and San Dieguito I and the fact that the starting date for San Dieguito I has never been firmly established.

Setting aside the Malpais, the three San Dieguito phases are distinguished from one another by increasing complexity in the tool kit. San Dieguito I kits consist almost entirely of large, percussion-flaked objects (choppers, spokeshaves, and scraper planes), while San Dieguito II craftsmen added smaller, more finely made blades and points and a wider range of scraper and chopper types to the assemblage. San Dieguito III peoples added pressure-flaked items such as leaf-shaped points, plano-convex scrapers, crescent-shaped objects, and elongated bifacial knives, along with (possibly) portable manos and metates, at least at coastal sites (Iverson et al 2010). It has been suggested, based on ethnographic parallels, that processing of seeds and mesquite might have been done using wooden tools, which would not have survived in the archaeological record (Pendleton 1986).

In 1966, Malcolm Rogers, in his final writings on the subject, subdivided the San Dieguito range into four spatially discrete "aspects," with the deserts of southwestern Arizona falling within the range of the "Southeastern Aspect" of the San Dieguito complex. He believed that, while the San Dieguito I complex could be found across the entire extent of this aspect, during San Dieguito II times (which corresponds to the warm, dry period known as the Altithermal), San Dieguito peoples retreated to the Colorado River Valley, and that by San Dieguito III, they had departed from the Southeastern Aspect altogether (Rogers 1966). Subsequent work (Hayden 1976, Huckell 1998) has largely supported this interpretation.

Archaic Traditions (8500 B.C.–ca. A.D. 200/300)

Paleobotanical evidence recovered from packrat middens indicates that a significant change in climate began around 11,000 years ago, marking the beginning of the Holocene period in Arizona (Van Devender and Spaulding 1979). Continental glaciers retreated, leading to an increase in temperature and aridity and an upward and northward shift in vegetation communities. Many of the large game animals hunted by Paleoindian people became extinct (Martin 1967), and, in response, the relatively simplistic Paleoindian subsistence systems built around following game herds wherever they wandered evolved into a more complex foraging and hunting economy built around a pattern of exploiting resources available seasonally at different locations visited in the course of a yearly round. Such an economy was labeled a Mesoindian, or Archaic, lifeway (Willey and Phillips 1958). Two discrete Archaic traditions have been defined in areas bordering on west-central Arizona: the Amargosa tradition and the Cochise culture.

The Amargosa Tradition

The Amargosa tradition was first defined during Rogers' (1939, 1966) studies of sites near playas and stream channels in the Mojave Desert of southern California. Rogers originally defined a sequence of three phases termed Pinto-Gypsum, Amargosa I, and Amargosa II. As with Rogers' San Dieguito sequence, this original sequence was revised as a result of Haury's (1950:532–538) investigations at Ventana Cave. The revised phase designations slipped backward somewhat, the term Amargosa I coming to be applied to finds with Pinto and/or Amargosa points, Amargosa II to finds with Gypsum points, and Amargosa III to the later part of the sequence (formerly Amargosa II), a period when elongated knives and primitive brown ware ceramics were beginning to appear in artifact assemblages. Basically, the Amargosa tradition is defined by the addition of formal grinding implements and various projectile point styles to the San Dieguito lithic assemblage (Rogers 1939, 1966). As with the San Dieguito complex, dating remains problematic with the Amargosa tradition, since sites tend not to contain elements that can yield absolute dates (i.e., hearths or posts), and, again, early attempts at dating were based largely on measurements of relative degrees of patination on artifacts. While the use of this method has been largely discredited (although experimentation continues even now), a highly varied set of date ranges for Amargosa findings, based largely on the use of this technique, has appeared in the literature, and is still occasionally cited. Rogers (1966) suggested that the San Dieguito to Amargosa transition occurred by 5000 B.C., while Antevs (1955) gave a date range of 8000–3000 B.C. for the sequence. Haury (1950) suggested a range of 3000 B.C.–A.D. 1, and Irwin-Williams (1979) suggested 3000–500 B.C.

The Cochise Culture

The Cochise culture was first defined by Sayles and Antevs (1941; Sayles 1983) based on deeply buried cultural deposits found in arroyo banks in southeastern Arizona. Sayles and Antevs defined a series of three stages for the Cochise culture: the Sulphur Spring stage (8500–6800 B.C.), characterized by the use of small ground-stone implements suitable for seed processing and (misleadingly) by an absence of projectile points; the Chiricahua stage (3500–1500 B.C.), characterized by distinctive projectile points and the appearance of "protopestles" for processing new types of resources; and the San Pedro stage (1500–800 B.C.), characterized, among other things, by the first appearance of habitation structures (Sayles 1983). In the 1950s, the existence of a fourth stage in between the Sulphur Spring and Chiricahua was postulated (Sayles 1983). This was essentially a more hunting-oriented manifestation than the otherwise generally similar Sulphur Spring stage, but it was never widely accepted by scholars (cf. Whalen 1971) and was ultimately dropped, consensus having decided that this was simply a variation on the Sulphur Spring

adaptation. Dates for these phases were ultimately obtained from excavations done at rock shelter sites in the Mogollon area. The gap between the Sulphur Spring and Chiricahua phases has been explained as a possible result of drying conditions, which may have caused populations to abandon the low desert valleys of southeastern Arizona in favor of higher ground elsewhere.

The Cochise-Amargosa Interface

While the Cochise culture is reasonably well documented in southeastern Arizona, as is the Amargosa tradition in southern California and southwestern Arizona, relatively little is known about the lifeways of peoples living in between the core areas for these cultures during Archaic times. Excavations in the Harquahala Valley in west-central Arizona have been interpreted as representing a mixture of Amargosa and Cochise traits (Bostwick 1988:326–327), and a similar mixture of traits was noted at Ventana Cave (Haury 1950). Haury (1950:531–533) suggested that Ventana Cave was a "meeting ground" between the Amargosa and Cochise traditions, and that by the Late Archaic (San Pedro) phase, the Cochise culture had expanded into western and southwestern Arizona, subsuming the Amargosa tradition. Other explanations for the apparent mixture of Amargosa and Cochise materials have been presented (Bostwick 1988:326–328), and in fact, the very notion that there is a dichotomy between the Amargosa tradition and the Cochise culture has been challenged (Berry and Marmaduke 1982:118; McGuire 1982:177).

Because discussions in which the archaeology of little-studied areas is characterized as a combination of traits from traditions not local to those areas can bias discussions of the archaeology of understudied regions, many archaeologists, following the lead of Bruce Huckell, have attempted in recent years to invoke a pan-Southwestern phase sequence to replace the more localized Cochise, Amargosa, and other sequences that have previously been developed for the Southwest. Under this formulation (Huckell 1996), a three-stage sequence replaces the older sequences and consists of an Early Archaic period dating to between ca. 7500–4300 B.C., a Middle Archaic period dating to between ca. 4300–1800 B.C., and a Late Archaic period dating to between ca. 1800 B.C.–A.D. 1. Each stage is distinguished largely by projectile point and ground stone tool types. This formulation also makes it unnecessary to speak of findings from a given area in terms specific to neighboring regions, an approach that has found greater favor in the area spanned by the Cochise culture than elsewhere.

Ceramic Period (Prehistoric and Protohistoric) (ca. A.D. 200/300–1500)

As the designation implies, this period is characterized by the presence of ceramic vessels. This new storage and food processing technology is generally viewed as an indication of a trend toward a more sedentary lifeway. Early agricultural groups in southeastern Arizona may have begun experimenting with ceramic technology as early as 800 B.C., but vessels large enough for the storage of seeds and small serving bowls did not appear until roughly the beginning of the first millennium A.D. (e.g., Heidke 2005).

In the lower Colorado region, the ancestral Yuman cultural tradition is not as well understood and has not received the same intense interest from archaeologists as the Hohokam tradition to the east. The Patayan (the designation for the archaeological material culture or tradition) cultural sequence was initially developed by Malcolm Rogers (1945), was based largely on ceramic attributes, and was further refined by Waters (1982a, 1982b). The three phases (Patayan I, Patayan II, and Patayan III) were assigned temporal ranges based on the cross-dating of Lower Colorado Buff Ware (Patayan) and occasional Hohokam Buff Ware sherds found in association.

The Patayan tradition is associated with plain and decorated Lower Colorado Buff Ware, floodwater farming along the lower Colorado and lower Gila Rivers, wild resource procurement and processing camps in the surrounding deserts, and limited activity loci where one or few resources were procured over a short period of time (e.g., Doelle 1980; Huckell 1979; Slaughter et al. 2000; Waters 1982a, 1982b). These settlement units were linked together by an elaborate system of trails that were often associated with dedicatory offerings such as broken partial vessels and trail shrines. Patayan peoples practiced agriculture as part of their subsistence strategy, but apparently to a lesser degree than neighboring cultures. While some Patayans practiced floodwater farming and lived at least part of the time in agricultural hamlets consisting of clusters of shallow pit structures or elongated surficial "lodges" along the Colorado River, many lived (or at least spent most of their time) away from the rivers, continuing to dwell, as had Amargosan peoples, in extremely ephemeral structures. Sleeping circles on desert-paved surfaces are the only visible remains of these "habitations" (Ahlstrom et al 2000).

Evidence of socioreligious activity is generally found near permanent or quasi-permanent water sources—*tinajas* (rock tanks), springs, seeps, *pozos* (wells)—in the form of broken partial vessels, wood sticks, petroglyphs, pictographs, and special bedrock grinding features such as slicks, cupules, and mortars (e.g., Hartmann and Thurtle 2000). Temporary camps in the desert region include cleared areas in the desert pavement associated with sparse artifact scatters of ground stone, flaked stone, ceramics, and, often, thermal features (e.g., Hartmann and Thurtle 2000; Slaughter et al. 2000; Tucker 2000). Cremation burial was practiced, but, in contrast to Hohokam practices, the burned ash was not collected after cremation, but rather scattered to the wind.

Malcolm Rogers believed that the differences between Patayan and Hohokam practices were substantial enough to rule out significant influence from the latter, believing instead that Patayan peoples immigrated to the area from southern California, bringing in ideas of their own (Rogers 1939, 1966). In contrast, Albert Schroeder (1957, 1979) believed that Patayan culture developed in situ in the western deserts and that Hohokam influences (as indicated by the use of paddle-and-anvil techniques in pottery making and the adoption of red-on-brown decoration) were indeed critical in the development of the culture. Others have noted influences, particularly in the early phases, from the Basketmaker/Anasazi peoples to the north (Reid and Whittlesey 1997).

Following Rogers (1945), Waters (1982a:Figure 7.3) devised the Patayan ceramic complexes that include Patayan I (A.D. 600–1050) (Black Mesa Buff, Colorado Beige, and Colorado Red), Patayan II (A.D. 1000–1500) (Tumco Buff, Salton Buff, and Topoc Buff), and Patayan III (A.D. 1000–1850) (Palomas Buff, Parker Buff, Tumco Buff, Topoc Buff, and Salton Buff). For both researchers, "traits of primary importance for establishing temporally sensitive Lowland Patayan pottery types are changes in surface treatment, jar rim forms, and vessel form. Temper, a fourth trait, is given secondary importance" (Waters 1982a:281). According to Waters (1982a, 1982b), stucco finish on the exterior surface of cooking pots was a type of surface manipulation found solely in Patayan II and Patayan III vessels.

Except for the Patayan I types (which are distinctive in vessel form, rim [notched] and shoulder shape [Colorado shoulder], and in their decorative elements), the later types are not time sensitive. Patayan I vessel morphological and decorative attributes include the sharp Colorado shoulder, rim notching, incised decorations, burnishing, red clay slip, and, occasionally, loop and lug handles. Patayan II vessels are characterized by the absence of these characteristics. New traits include

recurved rims, high and straight necks, and tear-shaped water jars. Patayan III pottery is comparable to the Patayan II pottery with the occasional addition of folded rims.

Salton Buff pottery is distinct in its tempering agent, which consists of shell from Lake Cahuilla. The production center of Salton Buff is limited to the shores of Lake Cahuilla in southern California. Patayan III pottery was manufactured throughout the Protohistoric period and into the Historic period (Waters 1982a:281–297). A tighter ceramic chronology is unlikely until well-stratified sites are examined through excavation (and such sites are likely buried under deep alluvium along the shores and floodplains of the lower Colorado and lower Gila Rivers).

An increased occurrence of Lower Colorado Buff Ware along the Gila River to Gila Bend and eastward has been observed after A.D. 1100–1150 when small settlement units consisting of dispersed *rancherías* with Lower Colorado Buff Ware dominate and Hohokam settlements (including the large villages with ball courts) are depopulated (e.g., Breternitz 1957; Vivian 1964; Wasley and Johnson 1965). The Patayan expansion, as indicated by *rancherías* settlements and Patayan III pottery, has been interpreted as early evidence of Yuman groups participating in alliances and trade networks that became more apparent and solidified in historic times.

Historic Era (A.D. 1500–1960)

Spanish Period

The first entry into what is now Arizona by people of European descent came in the late 1530s. A group of four men, including Álvar Nuñez Cabeza de Vaca, who survived a 1528 shipwreck on the coast of the Gulf of Mexico and then wandered across the Southwest before finally reaching Spanish-held territory in Sonora in 1536, may have passed through the state, although this has been questioned in recent years (cf. Chipman 1987). Marcos de Niza, a priest dispatched as an advance scout for an expedition into the lands through which the Cabeza de Vaca party supposedly passed, likely explored the eastern part of the state in 1539, although his activities, too, have been called into question by modern researchers (cf. Sauer 1971). The first European to unequivocally enter Arizona was Francisco Vasquéz de Coronado, who passed through the state on his way to the Pueblo area in New Mexico in 1540. As an adjunct to Coronado's expedition, Hernando de Alarcón was sent by sea up the west coast of Mexico, with the intention of linking up with Coronado at some unspecified place. Alarcón discovered the mouth of the Colorado River and a crossing spot at Yuma, but his visit would not lead to any permanent Spanish presence in western Arizona (Weber 1992). A few months later, the spot was visited by a second Spanish expedition led by Melchior Díaz, who traveled overland from Sonora via a trail that he would name the Camino del Diablo in order to meet up with Alarcón. Díaz was too late to meet up with Alarcón, but found a message left by his countryman (Flint and Flint 2004). Alarcón and Díaz described the lower Colorado River area as a war-torn region and mentioned native groups they identified as the Quiquima or Quicoma and Koxwan or Ciana (*koxkha'n*). It is not clear who these people were, but they are thought to be the Quechan or Kouanas (Greystone Environmental Consultants 2005:3.2-6). Additional information about the Quechan culture is presented in the Ethnography, below.

Over the course of the sixteenth and seventeenth centuries, the Spanish pushed their northern frontier inexorably northward from central Mexico. While they penetrated into present-day New Mexico in the late sixteenth century, establishing a colony along the Rio Grande north of present-day Albuquerque in 1598, no comparable presence was established in Arizona until roughly a

century later, and this settlement (at least initially) took on a very different form. In the 1680s, Jesuit missionaries, led by the Austrian Eusebio Francisco Kino, began to establish missions in Baja California and northern Sonora (Weber 1992), the Sonoran missions ultimately extending north of the modern International Border into Arizona. Most of the Sonoran missions were located along a north-south axis, which, north of the border, corresponds to the Santa Cruz River Valley. One exception, the most remote of the Sonoran missions, was Nuestra Señora de Loreto y San Marcelo de Sonoyta, located about 80.5 km (50.0 miles) southeast of Dateland. This community was (and is) located on the Camino del Diablo pioneered by Díaz 150 years earlier. The Camino del Diablo never became a heavily traveled route, but it was periodically used by missionaries to move overland between the Sonoran and Baja California missions. In 1774, military officer Juan Batista de Anza used the trail to lead a party of 200 colonists overland to California (U. S. Fish and Wildlife Service n.d.). The colonists settled at Monterrey while Anza himself and a small scouting party proceeded north and reconnoitered the sites for what would become the Presidio of San Francisco and the Mission San Francisco de Asís.

Kino had visited the confluence of the Gila and Colorado Rivers during expeditions in 1700 and 1701 (Greystone Environmental Consultants 2005:3.2-7–3.2-8). Kino was the first to refer to the people inhabiting the region, who called themselves the Kwichyana or Kuchiana, as the Yuma or Yuman (Heuberger n.d.:4). The misnomer "Yuma" possibly derived from the missionaries' misunderstanding of the word "yah-may-o," meaning "son of a captain" or chief (Barnes 1935:499) (see Quechan Ethnography, below, for an alternative origin of the name "Yuma"). Following these visits, interaction between the Spanish and the Quechan increased significantly. Nearly a century later, two missions and accompanying settlements were established north of the confluence. The Spanish recognized the strategic importance of the Colorado River crossing at Yuma and consequently desired to remain on good relations with the Quechan. However, disputes over resources between settlers and natives led to a native uprising in 1781. Following the uprising, interactions between Europeans and the Quechan were minimal until the American period.

American Period

Following a relatively short interval (A.D. 1821−1848) during which California and the Southwest was controlled by newly independent Mexico, the United States gained possession of most of Arizona with the Treaty of Guadalupe Hidalgo; they gained the remainder with the Gadsden Purchase of 1853. California attained statehood in 1850, becoming the 31st state. The 1850s were particularly tumultuous for the Yuman speaking peoples along the lower Colorado River. With the onset of the California Gold Rush following the discovery of gold at Sutter's Mill in 1848, hostilities erupted as increasing numbers of Euroamerican fortune hunters headed west into California. In the lower Colorado River region, the conflicts between Native Americans and would-be miners resulted in the development of Camp Yuma in 1852 (Greystone Environmental Consultants 2005:3.2-8), after which time the Quechan lost control of the lands around the Yuma Crossing. In 1858, the Mohave War began following a Mohave attack on the Beale's Road immigrant trail (the Battle of Beale's Crossing). This led to the establishment of Fort Mohave near Topoc, the second major U.S. military outpost on the Colorado River, in 1859 (Walker and Bufkin 1979:26). In 1860, the U.S. Army defeated the Mohave in the last major conflict in the lower Colorado River region.

The military post of Fort Yuma had originally been established in 1849 as Camp Calhoun, later becoming known as Camp Independence and then Camp Yuma (State of California 2013; Hart 2014). The initial purpose of the camp was to protect the nascent settlement of Colorado City

(which would eventually become Yuma) and its strategically located river crossing from the Quechan, who were hostile to the incursion of the settlers. The cost of maintaining the post led to a brief period of abandonment in 1851, but it was re-established in 1852 as thousands of gold seekers began passing through the Yuma Crossing. While the California Gold Rush was the primary impetus for the growth of Colorado City, the settlement expanded when it was recognized that bringing goods via ship to the mouth of the Colorado River and distributing them from the fort was an effective means of getting supplies to other military outposts across the Southwest. This led to the establishment of the U.S. Army Quartermaster Depot, which was in operation from the 1860s until the 1880s (Yuma Visitor's Bureau 2014).

Colorado City burgeoned as the result of being both a seaport and a major crossing point on the river for travelers and immigrants heading west. After virtual destruction resulting from major flooding in 1862, Colorado City was rebuilt and renamed Arizona City. Following the Civil War, rather elaborate plans were made for the city's continued development as a commercial center. Arizona City was formally incorporated in 1871 and renamed once again as Yuma in 1873. In 1876, the Yuma Territorial Prison was constructed on a hill across from the fort, where it operated for 33 years until it was relocated to Florence, Arizona, because of overcrowding (Arizona State Parks 2014). In 1877, the first locomotive to cross the Colorado River entered Arizona at Yuma, inaugurating the long-anticipated establishment of the railroad in Arizona. Four years later, the Southern Pacific Railroad connected with the Texas Pacific Railroad east of El Paso (Walker and Bufkin 1979:46).

In 1884, the Fort Yuma Reservation was established for the Quechan on the western (California) side of the river. Prior to this time, the Quechan occupied six rancherías situated above the Colorado floodplain, moving to family farm plots on the floodplain during the growing season after the spring floods and until autumn. It is estimated that the Quechan derived 30–50 percent of their subsistence from agriculture, supplementing a mixed foraging and hunting economy (Greystone Environmental Consultants 2005:3.2-8–3.2-9). Quechan families gradually abandoned this lifeway following the establishment of the reservation, where they were allocated 4-ha (10-acre) plots of farmland under the Dawes Severalty Act of 1887, which in turn opened up the remainder of the traditional lands for settlement by non-natives (Stene 1996:4). In 1893, the extent of the reservation was drastically reduced by the U.S. government, which limited reservation lands to 2 ha (5 acres) per living person. Much of the original reservation land was returned to the Quechan in the 1970s (Halpern 1997:3).

Fort Yuma itself continued as a military installation until 1883, when its management was transferred to the U.S. Department of the Interior. The end of the Civil War and the declining conflicts with Native Americans further rendered the fort unnecessary. In addition, the arrival of the railroad in 1877 had obviated the need for the military's use of the Quartermaster's as a supply distribution hub (Hart 2014). Military operations in the Yuma region would remain dormant until the establishment of the Yuma Proving Grounds during World War II.

Much of the subsequent history of Yuma pertains to agriculture and the management of the Colorado River. The Yuma Project, an ambitious endeavor to irrigate the lower Colorado River valley, was initiated by the U.S. Reclamation Service (later the Bureau of Reclamation) in 1904. The Reclamation Service took over the abandoned Fort Yuma facilities as its headquarters. The first project was the Laguna Dam, which was constructed from 1905–1909 (Stene 1996:5–6; National Park Service 2014). Laguna Dam, located about 21 km (13 miles) northeast of Yuma (Bureau of

Reclamation 2009), gave rise to the construction of several canals, including the Yuma Main Canal (AZ X:6:67[ASM]) and its laterals and the East Main (AZ X:6:65[ASM]) and West Main Canals (AZ X:6:63[ASM]), both of which split from the Yuma Main in the town of Yuma after diversion beneath the river via the Colorado River Siphon (Stene 1996:8–9). Construction on the Colorado River Siphon (AZ X:6:40[ASM]) began in 1909 and was completed three years later. A 4.2-m-diameter (14.0-foot-diameter) tunnel was excavated through the sandstone underlying the river for a distance of nearly 305 m (1,000 feet); the tunnel was lined with concrete and was connected to two 22.5-m-deep (74.0-foot-deep) vertical shafts on either side of the waterway. The Laguna Dam successfully weathered the severe flooding of 1912 and continued diverting water until 1948, when it was superseded by the Imperial Dam (completed 8 km [5 miles] upstream from the Laguna Dam in 1938) and the All-American Canal (Stene 1996:17). The All-American Canal replaced the Alamo Canal, a significant segment of which flowed through Mexico. In order to establish a canal that was located exclusively on U.S. lands, the All-American Canal was constructed by the Bureau of Reclamation beginning in the 1930s. By 1942, it became the sole water source for Imperial Valley (Imperial Irrigation District 2014). The All-American Canal feeds the Bard Water District, which was established in 1927 by water users from the Reservation Division of the Yuma Project (Stene 1996:19). The Bard Water District maintains the Reservation Division, which consists of 3,058 ha (7,556 acres) of land on the Quechan Indian Reservation, and the Bard Division, which consists of 2,881 ha (7,120 acres) of private land (Border Environment Cooperation Commission 2014).

To encourage travel along the proposed Ocean-to-Ocean Highway (U.S. Highway 80) that would connect southern California with the rest of the United States, the Ocean-to-Ocean Bridge was constructed across the Colorado River at Yuma in 1915. Construction of the bridge was a joint effort of the Office of Indian Affairs and the states of California and Arizona, and it was fervently promoted by Yuma's business community. When completed, it was the only highway bridge crossing the Colorado River for some 1,931 km (1,200 miles) (Baker 1978). For a time during the Great Depression, a checkpoint was established by the State Police on the California side of the bridge to prevent the massive influx of people migrating west in search of employment. If the "Okies" or "Arkies" had no money or lacked proof of a job waiting in California, they were not allowed to enter the state. Many of those who were turned away set up camp in Yuma, and a neighborhood still bears the unofficial designation "Okietown." The bridge continued as a crossing point for vehicular traffic until 1988, when it was determined to have become structurally unsound (Yuma Visitor's Bureau 2014; Drive the Old Spanish Trail 2014). However, at some point, the bridge was reopened to vehicles, as it currently serves as an access point to the Fort Yuma–Quechan Reservation. The bridge is now listed on the National Register of Historic Places.

Following the United States' entry into World War II, combat training centers were established across the desert Southwest. The harsh desert conditions were considered ideal to prepare soldiers for combat overseas, particularly in North Africa. Camp Young, located in the Mojave Desert between Indio and Desert Center, California, served as headquarters of the Desert Training Center (DTC). Major General George S. Patton was Camp Young's first commanding officer and was assigned the task of selecting other desert locations for additional training areas (Bureau of Land Management [BLM] 2013). Ten other camps were established across the California and Arizona deserts. After Patton went to North Africa, the DTC was renamed the California-Arizona Maneuver Area (CAMA). Over a million men trained at the DTC/CAMA from 1942–1944, when the camps were closed. Camp Pilot Knob (in California) and Camp Laguna (in Arizona) were located in the Yuma vicinity. In 1943, the Yuma Test Branch was established downriver from the Laguna Dam for

the purpose of testing portable combat bridges (U. S. Army 2014). The Yuma Test Branch closed briefly in 1950 and reopened in 1951 as the Yuma Test Station. The Yuma Test Station became the main artillery and armament testing range in the United States. It was later renamed the Yuma Proving Ground and remains an important military installation today.

QUECHAN ETHNOGRAPHY

As discussed in the foregoing section, the Quechan are a Native American people inhabiting the region around the confluence of the Gila and Colorado Rivers. The name "Quechan" literally means "those who descended" (Bee 1983:97). The name "Yuma" is the Spanish name for the Quechan and likely derives from the Akimel O'odham/Tohono O'odham name for them: *yumi*. They are one of the several Yuman-speaking groups in southern California and western Arizona. For convenience, ethnologists, beginning with Kroeber in 1943 (Stewart 1983a), have placed the Yuman people into four broad geographical groups. The Delta Yumans include such people as the Cocopah in the Colorado delta area; the Upland Arizona Yumans include the Walapai, Havasupai, and Yavapai; and the California Yuman-speakers consist of southern Californian groups such as the Kumeyaay (or Kamia) and Tipai-Ipai (or Diegueño). The fourth group, the River Yumans, comprise two closely related peoples, the Mohave and the Quechan. The Mohave and Quechan were culturally similar and traditionally were allied in opposition to several other groups in the area, including the Halchidhoma, the Maricopa, and the Cocopah (Stewart 1983b:56).

The following brief ethnographic account attempts to form a model of Quechan culture in pre-reservation times (i.e., prior to 1884), while tracing the impacts from Euroamerican interaction with the Quechan people historically.

History and Early Sources

The early records of contact between the Spanish and the Yuman Tribes that lived along the Lower Colorado are sparse. The earliest records—those of the Hernando de Alarcón and Melchior Diaz expeditions in the 1540s—do not mention the Quechan at all (Spicer 1962:262). The first substantial records of the Quechan made by Europeans were made during Juan de Oñate's 1604 expedition of the Colorado River via the Bill Williams Fork (Bean and Brakke Vane 1978:5-44). The next contact with the Spanish occurred during Father Eusubio Kino's expeditions to ascertain whether California was an island or peninsula, beginning in 1698 (Spicer 1962:263–264). Kino was apparently well-received by the different Yuman groups on the Colorado and Gila Rivers. Kino's last visit to the Quechan was in 1702, during his final expedition to determine California's geographical status.

The next visit from the Spanish did not occur until 1748, when the Jesuit missionary Father Jacobo Sedelmayr visited the area. However, unlike Kino, he was greeted with hostility by the Quechan. Part of the reason for this hostility was likely related to widespread epidemics among the Lower Colorado Tribes from diseases that had been introduced by Europeans. In addition, the Spanish slave trade (a practice later adopted by the Quechan) was also causing increasing hostilities elsewhere in the region (Bean and Brakke Vane 1978:5-44). In 1771, the Spanish had become fixated on establishing a permanent route between Sonora and Alta California, via the Colorado-Gila confluence region, or what would eventually come to be known as the Yuma route, or crossing. Spanish presence in the area accordingly intensified. The explorations for this route were led by General de Anza. At the same time, Father Franciso Garcés was busy trying to find a route through Yuma country to the Hopi region for missionizing purposes and was also conducting vigorous missionary activity among the Quechan.

Over the next ten years, Spanish influence on the Quechan and other Lower Colorado Tribes was great due to these activities but also because of the introduction of wheat as a winter crop and domesticated livestock (particularly poultry). The Spanish established two settlements (the pueblos of Yuma and Xuksi'l) near the crossing that consisted of farmers, priests, and soldiers. These settlers allowed their cattle to graze in the Quechan fields, effectively destroying their crops (Bee 1983:94). This would occur again in 1849 during the California gold rush, when vast numbers of people traveled through the crossing (Bean and Brakke Vane 1978:5-47). Warfare related to the ongoing slave trade continued, as did epidemics; syphilis was introduced to the area during the 1774 De Anza expedition (Spicer 1962:264; Bean and Brakke Vane 1978:5-44–5-45).

In the summer of 1781, the Quechan successfully revolted against the Spanish, destroying both settlements and killing 95 settlers, soldiers, and missionaries (including Garcés) and taking 76 people captive (Bean and Brakke Vane 1978:5-45). The route from Sonora to Alta California via the Colorado-Gila confluence area was effectively closed off, and the Quechan remained relatively isolated until 1827, when the Quechan opened the crossing to Mexican travelers taking the slave trade road between Caborca, Sonora, and southern California (Bean and Brakke Vane 1978:5-46).

Because of the sporadic contact between the Spanish and the Quechan and because of the success of the revolt of 1781, the Quechan retained many of their cultural traditions and lifeways, despite the Spanish enculturation of the 1770s. Nevertheless, during the course of the 19th century, the Quechan became increasingly subjected to Euroamerican political, religious, and economic impacts. These included the influx of would-be miners following the discovery of gold in California in 1848, the establishment of Fort Yuma in 1852, the arrival of the railroad in 1877, the establishment of the reservation and Catholic school in the 1880s, and the 1893 introduction of the Federal government's land allotment system (resulting from a local application of the Dawes Act of 1887) and irrigation projects (Bean and Brakke Vane 1978:5-48–5-51; Smith 2010; Bee 1983:94–95).

Territory and Settlement

The Quechan account of their origin states that they, like most of the other Lower Colorado Tribes and other Tribes farther to the west (such as the Kumeyaay in the San Diego area), came from the sacred mountain of Avikame (Newberry Mountain, near Needles, California). It is here that they were created by a creator being known as Kwikumat or Kukumat. From here, they migrated south. The lands regarded as traditional by the Quechan encompass an area extending from Needles to the Gulf of California. An anthropological model hypothesizes that the Quechan, as a tribal identity, formed between the 13th and 18th centuries when several patrilineal bands formed into a tribal affinity. Group proximity during horticultural activities, linguistic affiliation, and warfare may account for this formation (Bee 1983:86).

Geographically, the Quechan were organized into a number of rancherias, each consisting of several hundred people, organized into extended family groups. The rancherias were distributed along the Colorado River, north and south of the Gila confluence, and along the Gila (according to some Spanish accounts, as far as 26 miles east of the confluence). The internal structure of each rancheria changed throughout the year, with each extended family moving to their river bottomlands during the summer farming season and returning to high ground in the winter and during spring flooding. The rancherias also shifted up and down the rivers in response to food shortages and warfare (Bee 1983:87–89). Because of the warm climate, substantial housing was uncommon. Families dwelt

in dome-shaped arrowweed houses and ramadas both on high ground and near their fields during the growing season. In each rancheria, one or two larger and more substantial houses were occupied by the leading families. These houses could accommodate other rancheria members in extreme cold (Bee 1983:89–90).

Subsistence

Throughout their history (and presumably prehistory), the Quechan were primarily gatherers and horticulturalists, something attested to by the early Spanish chroniclers (Bee 1983:86). Wild game was not a primary source of nutrition, as the harsh desert conditions beyond the Colorado's floodplains limited the viability of hunting. Cultivated foods included maize, tepary beans, various melons, pumpkins, and wild grass seed; other foods, such as watermelons, black-eyed beans, and wheat, were introduced by Euroamerican immigrants. Interestingly, watermelons, a crop that spread extremely rapidly among North American Native populations upon its introduction, had been adopted by the Quechan prior to Kino's visit in the late 17th century (Rea 1997:299).

The Quechan practiced a diversified horticultural strategy, and planting of the several food crops occurred at different times of year. Maize and melons were planted in February and were not dependent on floodwater farming. Other crops were planted after the spring flooding of the Colorado. Winter wheat was sown in the autumn and harvested just before the floods. The wild grasses, which provided seeds to grind into meal, were sown in less fertile soils. The other main wild foods were mesquite and screw bean pods, which were probably the primary source of nutrition during years of crop failure (Bee 1983:86–87).

As discussed earlier, both cultivated and wild foods were affected by the arrival of Euroamericans, who would allow cattle to graze (or could not prevent them from doing so) in Quechan fields. In 1893, a long-term impact was made on Quechan horticulture by an agreement based on the Dawes Severalty Act of 1877 that persuaded Quechan farmers to limit their land holdings to five acres per person. All remaining land was then sold at public auction. This was a direct move by non-Natives to acquire the fertile bottomlands of the Colorado that the Quechan had farmed for centuries. The five-acre-per-person allotments were increased to ten acres in 1912. Meanwhile, the Yuma Project had been initiated by the U.S. Reclamation Service (later the Bureau of Reclamation) in 1904 and had the effect of disrupting the annual flooding and silt deposition of the Colorado River. By the 1920s and 1930s, farming was no longer a viable occupation, and many Quechans had become wage workers in Yuma. After years of claiming that the agreement was signed under duress and that the U.S government had not fulfilled its terms, 25,000 acres of land that had belonged to the original 1884 reservation were restored to the Quechan Tribe in 1978 (Bee 1983:94–95). Today, most of the farmland is leased to non-Native farmers.

Kinship and Polity

Socially, the Quechan were organized into patrilineal clans. The clans were exogamous units, with clan names borne exclusively by women. Some clan names may have originated from other Tribes such as the Mohave, Maricopa, or the Kumayaay. The rancherias were agamous; that is, anyone could marry outside the rancheria, but men most frequently married women from their own rancheria. Consequently, settlement was in practice bilocal, an important factor for the extended family as the primary economic unit (Bee 1983:89). Clan membership did not necessarily correspond to rancheria affiliation. Clan functions were largely disregarded by the 1960s, and many Quechans had forgotten their affiliation by that time (Bee 1983:90–91).

In general, the clan and rancheria were the basic social units among the Quechan and the extended family was the economic unit, as mentioned above. Tribal consciousness—when all the people identified as "Quechan", rather than as members of the smaller-scale social units of clan and Rancheria—occurred during warfare, harvest gatherings and annual mourning ceremonies (Bee 1983:92).

Early European sources described two main leadership positions among the Quechan, one that focused on civil affairs and one that focused on warfare. However, it seems that these roles may have been largely traditional, rather than consisting of any real political power. In practice, decisions were made by the leaders of individual Ranchерias, who probably consulted in council for matters of concern on the Tribal level (Bee 1983:92–93). Although some degree of inheritance may have been a factor in determining leaders, competence was a more powerful attribute. Competence depended upon public approval but also upon personal power bestowed by special dreams (Bee 1983:92–93). The dreams of a leader or candidate for leadership were evaluated by a group of elders, and the individual was required to undergo dreams appropriate to his office, although he was also required to be an effective leader.

Warfare

Warfare was a cornerstone of Quechan culture. Two types of warfare were distinguished: the small raiding party and the war party (Bee 1983:93). The raiding party was focused on creating havoc and obtaining horses or captives. Conflicts involving the war party consisted of a village raid followed by an arranged battle in which the opposing parties faced one another in two lines, ending in a hand-to-hand melee (McCorkle 1978:698). Bee (1983:93) points out that this had greater resemblance to a brutal team sport, where the two sides would agree upon weapons to be used and wait to attack until both sides had fallen into formation. The arsenal consisted of a "potato masher" war club of mesquite wood (typically a tapered cylinder mounted on a handle), wooden spears with fire-hardened tips, and bows. Because of their distinctive war club, the Quechan were sometimes referred to by the Spanish word "Garroteros," literally, "clubbers" (Bee 1983:97; Kroeber 1976:782).

Warfare among all the Yuman Tribes was closely intertwined with myth and ceremony, although casualties were real and occasionally heavy. An account of the first war party is given in the central creation myth. Traditionally, the function of warfare among the Lower Colorado Tribes was connected to Tribal prestige and ritual, rather than conflict over resources or similar, comparatively mundane concerns. For example, when a sorcerer was killed, this was an act that often precipitated group conflict. This is again connected to the importance of dreams in Yuman culture: dreams of success in battle were highly valued and became incorporated into song cycles; in addition, like the rancheria leaders, war leaders, ceremonial managers, and shamans obtained their positions through dreams (McCorkle 1978:698–699).

The Quechan and Mohave (to whom they are closely related culturally and linguistically) did not usually fight one another, but both engaged in conflicts with the Maricopa and Cocopah, who were sometimes allied with the Pima. There was likely a long history of warfare among the Yuman Tribes that predated the arrival of Europeans. However, warfare may have increased in scale and intensity during the 18th and early 19th centuries for economic reasons—a departure from the tradition of "ritual" warfare (Bee 1983:93). The motivation for waging war appears to have been related to the taking of captives to trade to the Spanish and other Tribes for horses and other goods. However, it appears that land acquisition was still not a motivation for war at that time.

Death and Mourning

Mourning, along with dreaming and warfare, was one of the three most important aspects of the Quechan lifeway. Upon an individual's death, all of his or her belongings, including the family home, were destroyed or given away. This sometimes left the deceased's family destitute, and they would be provided for by friends or the rancheria leaders (Bee 1983:89). Inheritance was therefore never an important factor in pre-reservation life. Individual family garden plots were also abandoned, to be used later by non-family members. The *keruk* ceremony, the central mourning ceremony of the Yuman Tribes including the Quechan, was held after the death of an important leader or after an accumulation of deaths to be honored by the families of the deceased (Bee 1983:93). The *keruk* is alternatively known in older literature as *nyimits* (Kroeber 1976) or *nimíts* (Curtis 1906).

A central component of the *keruk* ceremony was a mock battle, prepared for and carried out in the same way as an actual conflict. It also was a reenactment of the battle that was fought following the death of the creator deity Kwikumat. The ceremony also involved the singing of songs commemorating the creation of the world, public mourning, and the destruction of the deceased's property. The ceremony was intertribal and lasted several days, forming an occasion for large-scale social interaction, wherein goods were exchanged, marriages were arranged, and enmities were resolved.

The *keruk* appears to have been associated with a pilgrimage trail between Pilot Knob (approximately 6.75 miles west of modern Winterhaven) and Newberry Mountain (the sacred mountain Avikame). Altschul and Ezzo (1995) have noted that the practice of the *keruk* seems to have intensified during the 18th and 19th centuries, contemporaneous with the intensified conflicts resulting from the horses-for-slaves trade introduced by the Spanish and with an influx of people migrating from the desiccating Lake Cahuilla. They suggest that the *keruk* and the associated pilgrimage was a unifying force transcending conflicts between inimical Tribes. Altschul and Ezzo (1995) likewise suggest that the intaglios along the trail, which are executed in different styles, were the locations of *keruk* rites unique to and performed by different Tribes. The *keruk* has continued into modern times in modified form (Bee 1983:96–97).

PREVIOUS RESEARCH

Prior to fieldwork, a Class I records search was performed. The Class I search examined all previously conducted surveys and previously recorded sites and historic properties within a 1.6-km-radius (1.0-mile-radius) buffer zone extending from the project footprint. Although the APE is located only on the California side of the state line, the buffer zone extends into Arizona as well. The Class I research was completed through consultation with the California Historical Resources Information System (CHRIS) for the California portion of the buffer and via the Arizona State Museum's (ASM's) AZSITE online database for the Arizona portion. The CHRIS data were received from the South Coastal Information Center (SCIC) on June 20, 2014 (Appendix E). These data were obtained in consultation with Arlene Kingery, Historic Preservation Officer for the Quechan Tribe, on May 16, 2014 (Appendix F). The AZSITE search was completed on April 15, 2014. In addition to the Class I searches, a Sacred Lands File (SLF) request was filed with the California Native American Heritage Commission (NAHC).

To ensure the protection of archaeological sites and historic properties, previous project and site locations depicted on maps are placed as a detachable appendix at the end of this report (Appendix

B). For the client copy of this report, Appendix B has been removed, but all agency copies are intact. The results of the Class I search are discussed by state below.

California

The Class I search found that 43 surveys have been previously conducted and 9 sites have been previously recorded within the 1.6-km (1.0-mile) buffer (Tables 1 and 2; see Appendix B, Figure B.1). In addition, one historic address (the Fort Yuma Train Depot) is present within the buffer zone (Table 3).

Three linear, non-canal, sites are present within the buffer. One of these sites, CA-IMP-7158, the historic Pilot Knob-Tap Drop 4 161kV Transmission Line, crosses the APE at two points. The line is supported, at least in the vicinity of the APE, by wooden towers and is currently in use. The line has been upgraded and maintained since its construction in the 1940s. The line crosses the APE near the intersection of Picacho Road and Indian Rock Road and again along Cocopah Road (Photo 14). Another site, CA-IMP-3456, is described as a "road course NE and SW" and is apparently based on a General Land Office (GLO) surveyor's notes from 1856. According to the site card, this site is now in Arizona because of a change in the course of the Colorado River. However, no indications of the site exist in the AZSITE database. Finally, a portion of the historic Southern Pacific Railroad (SPRR), passes through the buffer and crosses the APE along First Avenue. The SPRR (which was purchased by the Union Pacific Railroad in the 1990s) was constructed beginning in the 1870s and ran from the Los Angeles area to Yuma, and subsequently into Arizona. The line has been in active use since its original construction. Over the past several decades, a number of surveys in southern California have recorded segments of the SPRR and various features related to it. One such feature is the railroad bridge over the Colorado River, located adjacent to the Ocean-To-Ocean Bridge. This and several other railroad bridges in the vicinity (such as the bridges that cross the Yuma Main Canal and the All-American Canal) are subsumed under site number CA-IMP-3424.

Table 1. Previous Surveys within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Project No. (SHPO-ID)	Performing Institution	Report Reference
AEI 02-08	AEI Consultants	AEI Consultants 2002
BIA 96-01	BIA	BIA 1996
BLM 01-50	BLM and California Department of Fish and Game	BLM 2001
BREENJ 08-01	Logan Simpson Design, Inc.	Breen 2008
CROZIS 93-01	unknown	Crozier 1993
DAVISE 13-01	Logan Simpson Design, Inc.	Davis and Hart 2013
DUNCAH 07-01	Transcon Environmental	Duncan and Fertelmes 2007
GREENE 94-02	Bureau of Reclamation	Green and Middleton 1994
GUMERG 73-01	Prescott College	Gumerman and Weed 1973
JSA 99-01	Jones & Stokes Associates	Jones & Stokes Associates 1999
JSA 00-02	Jones & Stokes Associates	Jones & Stokes Associates 2000
KINKAG 03-01	BIA	Kinkade 2003

Project No. (SHPO-ID)	Performing Institution	Report Reference
MAXONJ 84-03	unknown	Maxon 1984
MCDONM 97-02	ASM Affiliates	McDonald and Victorino 1997
MEYERD 11-04	Federal Emergency Management Agency	Meyer 2011
MORENJ 95-01	Western Cultural Resource Management, Inc.	Moreno et al. 1995
MYERSL 05-01	Aztlan Archaeology, Inc.	Myers 2005
NASHB 09-01	Quechan Indian Tribe	Nash-Chrabascz 2009
PFAFFC 92-01	Bureau of Reclamation	Pfaff et al. 1992
PRESCC 73-01	Prescott College	Prescott College 1973
ROSENM 93-23	California Department of Transportation	Rosen 1993
ROXLAK 95-01	Mariah Associates, Inc.	Roxlau and Acklen 1995
SANDEJ 07-02	Chambers Group, Inc.	Sander and Maxon 2007
SCHAEJ 07-74	ASM Affiliates	Schaefer and Becker 2007
SCHAEJ 98-49	ASM Affiliates	Schaefer and O'Neill 1998
SCHAEJ 01-43	ASM Affiliates	Schaefer and O'Neill 2001
STONEL 90-01	Archaeological Research Services, Inc.	Stone and Hathaway 1990
SWART 81-01	Museum of Northern Arizona	Swarthout and Drover 1981
SWCA 06-02	SWCA Environmental Consultants, Inc.	SWCA 2006
TMCI 98-02	Tierra Madre Consultants, Inc.	Tierra Madre Consultants 1998
TRCMA 95-01	TRC Mariah Associates, Inc.	TRC Mariah Associates 1995
UNDERJ 10-18	Tierra Environmental Services	Underwood 2010
UNDERJ 11-19	Tierra Environmental Services	Underwood 2011
VCHP 06-01	Van Citters: Historic Preservation, LLC	Van Citters: Historic Preservation 2006
VONWEJ 96-215	Imperial Valley College Desert Museum	Von Werlhof 1996
VONWEJ 02-207	Imperial Valley College Desert Museum	Von Werlhof 2002a
VONWEJ 02-208	Imperial Valley College Desert Museum	Von Werlhof 2002b
VONWEJ 02-233	Imperial Valley College Desert Museum	Von Werlhof 2002c
VONWEJ 02-234	Imperial Valley College Desert Museum	Von Werlhof 2002d
WALSHM 13-01	Logan Simpson Design, Inc.	Walsh 2013
WHALEN 74-01	Imperial Valley College Musuem	Whalen 1974
WILCOR 93-01	Imperial Valley College Desert Museum	Wilcox 1993
YOSTS 01-01	TRC Mariah Associates, Inc.	Yost et al. 2001

Table 2. Previously Recorded Sites within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Site Number	Site Name or Description	Temporal Placement	Register Status/Whose Opinion
CA-IMP-158	El Rio site	San Dieguito I; Yuman I and III	not recorded
CA-IMP-3424	Southern Pacific Railroad	Historic (1870s–present)	considered Eligible (Jones & Stokes Associates 1999)
CA-IMP-3456	road course NE and SW	unknown	not recorded
CA-IMP-3476	unknown	unknown	not recorded
CA-IMP-6824	Reservation Main Drain Canal	Historic (constructed 1912–1914)	considered Eligible (Tierra)
CA-IMP-6830	Yuma (California) Main Canal	Historic (constructed 1909–1912)	considered Eligible (Tierra)
CA-IMP-6832	Reservation Main/Cocopah Canal	Historic (constructed beginning in 1907)	considered Eligible (Tierra)
CA-IMP-7130	All-American Canal	Historic (constructed 1934–1940)	not evaluated by recorder
CA-IMP-7158	Pilot Knob-Tap Drop 4 161 kV Transmission Line	Historic (early 1940s)	not evaluated by recorder

Table 3. Previously Recorded Historic Address within a 1.6-km (1.0-Mile) Radius of the Project Area (California)

Resource Name	Primary No.	Other Name	Description
C-YUMA EAST-B-3	P-13-008768	train stop at Fort Yuma	historic Fort Yuma Train Depot; the building consists of two brick structures connected by a breezeway

Photo 14. Wooden towers of the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158).

The remaining three sites are historic canals, each presently in active use. The canals consist of the Yuma Main Canal (CA-IMP-6830), the Cocopah Canal (CA-IMP-6832), and the Reservation Main Drain Canal (CA-IMP-6824). The site records on file at the South Coastal Information Center (SCIC) were updated to reflect observations made where the canals cross the current APE. Descriptions of the canals are provided below.

In addition to the Class I file search conducted through CHRIS, an SLF request was filed with the NAHC. The NAHC maintains inventories of known Native American human burials and sacred places within the State of California. The SLF search indicated that no known burials or sacred sites are present within the APE (Katy Sanchez, Associate Government Program Analyst with the NAHC, personal communication, September 21, 2014). It is emphasized that a negative finding does not preclude the potential presence of unknown or undocumented properties.

Canal Descriptions

Three historic canal sites were updated (see Figure B.1). All three were constructed directly or indirectly as part of the Yuma Project. The construction of a system of smaller laterals coincided with that of the larger canals, and these are presumably represented today by the various ditches paralleling the modern roads in the region. The laterals crossed by the APE include the Papago, Tonowanda, Hopi, Pima, Pueblo, and Navajo Canals. Because these laterals represent components of the larger canal system fed by the main canals, they were not recorded as separate sites. It has not been possible to directly correlate specific laterals with their parent canals. Primary Record; Building, Structure, and Object Record; and Linear Feature Record forms have been prepared for each canal. These forms can be viewed in Appendix C. For the Yuma Main Canal, the Reservation Main/Cocopah Canal, and the Reservation Main Drain, these update earlier Historic Resources Inventory Records or Primary Record forms. The Walapai Canal is newly recorded.

The Yuma Main Canal (CA-IMP-6830)

The APE crosses the Yuma Main Canal (also known as the California Main Canal) at a point along Arnold Road to the west of the Arnold Road/Picacho Road intersection (see Figure B.1). Arnold Road is bridged at the canal crossing. Today, the Yuma Main Canal continues to convey a large volume of water from the All-American Canal to the south (Photos 15 and 16).

The Yuma Main Canal is a large earthen canal. It was constructed as a diversion canal originating from the Laguna Dam. Construction of the canal began in 1909 and was completed by 1912 (Stene 1996:9). The Yuma Main originally diverted water from the Laguna Dam, but this diversion was discontinued in 1941 following the construction of an earthen dike across the canal (Stene 1996:17). After this time, the canal began to divert water from the Siphon Drop Spillway along the All-American canal. The Yuma Main continued through the Reservation Division to the Colorado River Siphon, where it passed beneath the river into Yuma and the Arizona side, and to the Valley Division of the Reclamation Service's (later the Bureau of Reclamation) Yuma Project (Stene 1996:8). In Yuma, the Yuma Main was split into the East and West Main Canals.

In Arizona, the Yuma Main Canal, the Colorado River Siphon, the East Main Canal, and the West Main Canal have all been recorded as archaeological sites (AZ X:6:67, X:6:40, X:6:65, and X:6:63[ASM], respectively). The canals (but not the siphon) have all been determined individually eligible for inclusion on the NRHP by the Arizona State Historic Preservation Office (SHPO).

Photo 15. Yuma Main Canal, from Arnold Road. View is to the north.

Photo 16. Yuma Main Canal, crossing beneath Arnold Road. View is to the west.

However, it does not appear that the California reach of the Yuma Main Canal has been officially recorded as a historic site or been evaluated for its NRHP status.

At the crossing at Arnold Road, the canal measures roughly 38 m (125 feet) in width. Because the canal currently conveys a large volume of water, it was not possible to determine the canal's other dimensions or its shape in cross-section. However, according to the existing Historic Resources Inventory Record for this property, the canal bottom averages 15 m (50 feet) in width, and the sides slope 1.25:1 with a water depth of about 2.7 m (9.0 feet).

Reservation Main/Cocopah Canal (CA-IMP-6832)

Construction on the Reservation Main Canal began in 1907 (Stene 1996:9); construction on an extensive system of laterals from the Reservation Main commenced the following year. The Reservation Main originally split from the Yuma Main Canal at Indian Heading. The Mojave and Cocopah Canals were split from the Reservation Main. The canal continues to convey a moderate volume of water. Today, the Reservation Main flows westward along Heyser Road and turns south at the interchange of Heyser Road, Stalnacker Road, and Avenue E, where it joins the Cocopah Canal.

The APE does not cross the Reservation Main Canal proper, but it does come within close proximity of it at the road interchange (see Figure B.1). However, the APE does cross the Cocopah Canal along Ross Road, and it parallels the canal along Cocopah Road. The APE also crosses the Cocopah Canal at Picacho Road (Photo 17), Ross Road (Photo 18), and the intersections of Flood Road and Haughtelin and Arnold Roads. Because the Cocopah Canal (along with the Mojave Canal, which is not crossed by the APE) was historically a diversion of the Reservation Main, it is considered a component of the same system and was not recorded as a separate site. Because of the close association of the two properties, the site as a whole is referred to herein as the Reservation Main/Cocopah Canal. Much of the Cocopah Canal has been lined with concrete, but portions of it remain earthen, such as at its crossing at Picacho Road.

Reservation Main Drain Canal (CA-IMP-6824)

The Reservation Main Drain Canal spans the Fort Yuma–Quechan Reservation and serves as a drainage for field runoff (see Figure B.1). It empties into the Colorado River about a 0.8 km (0.5 miles) downstream from the Southern Pacific Railroad Bridge. It was constructed between 1912 and 1914 and was designed to drain excess water from the very flat lands in the river valley, which have a high water table (Pfaff et al. 1992). This waterway may also be indicated as a "Ditch" in Sections 23 and 26 on a BLM plat of Township 16 South, Range 22 East, SBB&M, dated September 7, 1951. However, only a segment of the ditch appears on the map.

The APE crosses the Reservation Main Drain along Picacho Road (Photos 19 and 20), Arnold Road, Fisher Road, and Stalnacker Road. At each location, the canal is of earthen construction with a top width of approximately 7.6 m (25.0 feet). The canal is in active use and it was not possible to estimate its bottom width, but the Historic Resources Inventory Record indicates that its bottom width is 4.3 m (14.0 feet) and its average water depth is 0.9 m (3 feet).

Photo 17. Reservation Main/Cocopah Canal, from Picacho Road. View is to the northeast.

Photo 18. Reservation Main/Cocopah Canal, from Ross Road. View is to the south.

Photo 19. Reservation Main Drain, from Picacho Road. View is to the northeast.

Photo 20. Reservation Main Drain, from Picacho Road. View is to the southwest.

Arizona

The Class I search found that 18 surveys were previously conducted and 22 sites were previously recorded within Arizona portion of the 1.6-km (1.0-mile) buffer zone surrounding the project area (Tables 4 and 5; Figure B.2). There are also 22 historic properties and 3 historic districts listed on the NRHP within the buffer (Tables 6 and 7; Figure B.3). At least two of the properties, the Ocean-to-Ocean Bridge and the Gandolfo Theater, are cross-listed as archaeological sites and historic properties. These properties lie within Yuma or along the Colorado River.

Table 4. Previous Surveys within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Project No.	Performing Institution	Project Name or Description	Report Reference
2003-1362.ASM	Transcon Environmental, Inc.	Baja Norte/Yuma Fiber-Optic Project	Bassett 2002
2003-1282.ASM	Statistical Research, Inc.	Yuma MPG Site Survey	O'Mack 2002
2004-1814.ASM	Western Archaeological and Conservation Center	Yuma Gateway Park	Blythe 2005
2000-437.ASM	Archaeological Consulting Services, Ltd.	Yuma Territorial Prison Parking Lot	Jackman 2000
1994-111.ASM	SWCA Environmental Consultants, Inc.	Yuma Loop Line—Line Replacement Project	Mitchell 1994
1998-479.ASM	Archaeological Consulting Services, Ltd.	Salvage Excavation—Yuma Territorial Prison	Jensen et al. 1999
1994-367.ASM	SWCA Environmental Consultants, Inc.	Monitoring, Natural Gas Line Replacement, Yuma	Doak 1994
1999-587.ASM	SWCA Environmental Consultants, Inc.	PBNS Level 3 Fiber-Optic Line	Doak 1999
2008-467.ASM	SWCA Environmental Consultants, Inc.	EPNG Line 2123 MP0 to MP82	Hesse 2008
1982-203.ASM	Archaeological Research Services, Inc.	Yuma Crossing and Associated Sites, National Historic Landmark	Stone 1983
1999-122.ASM	Archaeological Consulting Services, Ltd.	Yuma Interstate Freeway Survey	DeMaagd 1999
2010-504.ASM	URS Corporation	AZ 4 Yuma North	Erickson 2010
BLM-050-97-25	Statistical Research, Inc.	dredging activities	Sterner 1998
BLM-050-91-20	BLM Yuma Field Office	no information available	no information available
BLM-050-91-48	BLM Yuma Field Office	no information available	no information available
BLM-050-95-51	BLM Yuma Field Office	no information available	no information available
BLM-050-92-54	BLM Yuma Field Office	no information available	no information available
14.35.SHPO	no information available	no information available	no information available

Table 5. Previously Recorded Sites within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Site Number	Site Name or Description	Temporal Placement	Register Status/Whose Opinion
AZ X:6:11(ASM)	Old Colorado Highway Bridge (Ocean-to-Ocean Bridge)	Historic (A.D. 1500–1950)	not recorded
AZ X:6:90(ASM)	trash dump (Yuma Territorial Prison State Historic Park)	Historic (A.D. 1500–1950)	not recorded
AZ X:6:94(ASM)	water tower foundation and historic trash	Recent (A.D. 1950–present)	not considered Eligible by recorder
AZ X:6:99(ASM)	historic slab and trash scatter	Middle Historic (A.D. 1800–1900); Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:43(ASM)	Yuma Valley Railroad	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:67(ASM)	Yuma/ California Main Canal	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:15(ASM)	Yuma Valley Levee	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:63(ASM)	West Main Canal	Late Historic (A.D. 1900–1950)	Eligible individually (SHPO)
AZ X:6:16(ASM)	bifurcation works, East and West Main Canal	Historic (A.D. 1500–1950)	Eligible individually (SHPO)
AZ X:6:65(ASM)	East Main Canal	Late Historic (A.D. 1900–1950	Eligible individually (SHPO)
AZ X:6:44(ASM)	no information available		
AZ X:6:97(ASM)	no information available		
AZ X:6:68(ASM)	Yuma Waterworks And Powerplant	Historic (A.D. 1500–1950)	Eligible individually (SHPO)
AZ X:6:40(ASM)	Colorado River Siphon	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:2(ASM)	Fort Yuma Headquarters Complex	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:12(ASM)	Combined with AZ X:6:1(ASM); also reported to be on Tribal land		
AZ X:6:4(ASM)	Gandolfo Theatre	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ X:6:70(ASM)	Residential and commercial features	Historic (A.D. 1500–1950); Recent (A.D. 1950–present)	considered Eligible (recorder)
AZ X:6:45(ASM)	Fifth Street residences	Historic (A.D. 1500–1950)	considered Eligible (recorder)
AZ FF:9:17(ASM)	State Route 80 historic alignment	Historic (A.D. 1500–1950); Recent (A.D. 1950–present)	Eligible individually (SHPO)
AZ X:6:1(ASM)	AZSITE reports site is on Tribal land		
AZ Z:2:40(ASM)	Southern Pacific Railroad Mainline Southern Route	Middle Historic (A.D. 1800–1900); Late Historic (A.D. 1900–1950); Recent (A.D. 1950–present)	Eligible individually (SHPO)

Table 6. Previously Recorded Historic Properties within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

Property Name	NRHP No.	Eligibility
Blaisdell Slow Sand Filter Washing Machine	79000430	listed
Brown House	82001626	listed
Cactus Press—Plaza Paint Building	87000613	listed
Connor House	82001629	listed
Dressing Apartments	82001630	listed
Gandolfo Theater	82001636	listed
Hotel del Ming	82001639	listed
Lee Hotel	84000750	listed
Masonic Temple	84000752	listed
Methodist Episcopal Church	82001645	listed
Methodist Parsonage	82001646	listed
Norton House	82001649	listed
Ocean-to-Ocean Bridge	79000431	listed
Ortiz House	82001650	listed
Pauley Apartments	82001652	listed
San Carlos Hotel	84000754	listed
Southern Pacific Railroad Depot	76000384	listed
Southern Pacific Railroad Passenger Coach Car—SP X-7	00000101	listed
Yuma City Hall	82001660	listed
Yuma County Courthouse	82001661	listed
Yuma City Hall	82001660	listed
Yuma Crossing and Associated Sites	66000197	listed

Table 7. Previously Recorded Historic Districts within a 1.6-km (1.0-Mile) Radius of the Project Area (Arizona)

District Name	NRHP No.	Eligibility
Brinley Avenue Historic District	82001625	listed
Yuma Main Street Historic District	94000068	listed
Yuma Multiple Resource Area (MRA)	–	National Park Service designation, but not an NRHP-listed property or district

General Land Office Maps

General Land Office (GLO) maps for the relevant Township and Range designations within both California and Arizona were also checked for indications of historic properties in the vicinity of the APE (Figure 2). The maps were accessed via the BLM GLO Records website (BLM 2014). All maps on which the APE is located were dated February 6, 1857. The APE itself crosses few properties: a "Cottonwood" along what today would be Picacho Road and an "Indian Field" on the northern end of the APE at Stalnacker Road and Flood Road, which is still a cultivated area today. Within the 1.6-km (1.0-mile) buffer, historic properties include Fort Yuma; the "Settlement of Captain Ankrum," which corresponds approximately to the location of modern Winterhaven; and "Western's House." Several sections note that "there are some Indian villages in this Section."

SURVEY EXPECTATIONS

Because the APE was known to follow road shoulders traversing heavily cultivated farmland, and because previously existing buried utilities (particularly copper telephone cable) were known to be present in the road rights-of-way, surface indications of archaeological sites were not expected. The presence of isolated occurrences and historic structures (such as canals and possibly buildings) was thought to be more likely.

SURVEY METHODS

The survey was conducted in accordance with standards established by the BLM for pedestrian surveys. According to these standards, 100 percent coverage of an area can be claimed if the entire area is surveyed by crews walking transects spaced no more than 15 m (50 feet) apart. The current project corridors were of such a width (100 feet) that they could be surveyed in compliance with these standards by having an archaeologist walk a transect down and back along the length of each corridor segment offset 7.5 m (25 feet) from the center line. A Garmin handheld global positioning system (GPS) unit was used for spatial control, and the project area was photodocumented.

Cultural properties identified during any survey are evaluated in accordance with standards established by California Office of Historic Preservation (OHP 1995), which in turn follow the NRHP standards defined by the National Park Service (National Park Service 1990). These standards generally require a property to be at least 45 years old. The 45-year criterion accounts for a typical 5-year lag between the recording of a resource and the implementation of planning decisions (OHP 1995:2). In some circumstances, a property less than 45 years old may be recorded. For a property to be recorded as a historical resource, it must conform to one of the following resource categories:

> **Building**: A building, such as a house, barn, church, hotel, or similar construction, is created principally to shelter any form of human activity. "Building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail or a house and barn.
>
> **Structure**: The term "structure" is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter.

T15S R24E, Portion of Sec. 32
T16S R22E, Portion of Sec. 11, 14, 21-26,
T16S R23E, Portion of Sec. 4, 5, 7-9, 18, 19
Imperial County, California
Araz, Bard, Yuma West, and Yuma East
USGS 7.5' Quadrangle

Figure 2. General Land Office maps showing location of the APE.

Project location
1 mile buffer

0 1,000 2,000
Feet
Meters
0 240 480

Tierra Right of Way

> **Object**: The term "object" is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.
>
> **Site**: A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archaeological value regardless of the value of any existing structure.
>
> **District**: A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

A property that cannot be readily classified as one of the five NRHP types defined above may be recorded as a "minor resource" (OHP 1995:3). These resources will be referred to herein as *isolated occurrences*. However, if such a property is considered to be of particular interest for some other reason, it may also be recorded as a site. Examples of such isolated occurrences would include rare types of projectile points or isolated but significant historic features.

Cultural properties are further evaluated with regard to significance, which is assessed largely in terms of a property's eligibility for inclusion on the NRHP. As defined by Code of Federal Regulations Title 36, Part 60.2 (36 CFR 60.2), the NRHP is "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). Pursuant to 36 CFR 60.4, these are the criteria by which properties are evaluated:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, 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 (National Park Service 2004).

The definition and evaluation of prehistoric and historic properties was furthermore guided by the 2014 CEQA guidelines and statutes (California Association of Environmental Professionals 2014). According to §21083.2:

> **(g)** [a] "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:
>
> (1) Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
>
> (2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.
>
> (3) Is directly associated with a scientifically recognized important prehistoric or historic event or person.
>
> **(h)** As used in this section, "nonunique archaeological resource" means an archaeological artifact, object, or site which does not meet the criteria in subdivision (g). A nonunique archaeological resource need be given no further consideration, other than the simple recording of its existence by the lead agency if it so elects.

SURVEY RESULTS

The entire APE was inspected for cultural remains. No new prehistoric archaeological sites were observed during the survey. One property, the Walapai Canal (Primary Site Number P-13-014813), was newly recorded as a historic site.

In addition to the canal, several isolated occurrences were recorded. Although not considered an archaeological site, the Fort Yuma–Quechan Indian Reservation Cemetery was also noted as an important cultural landmark in proximity to the APE. All of these properties are described below. Finally, five previously recorded linear sites (the Yuma Main Canal, the Reservation Main/Cocopah Canal, the Reservation Main Drain Canal, the Southern/Union Pacific Railroad, and the Pilot Knob-Tap Drop 4 161kV Transmission Line) were crossed by the APE. The three canal sites had their Primary Record, Linear Feature Record, and Building, Structure, and Object Record forms updated. The railroad and transmission line do not retain any of their original attributes where they cross the APE and were not updated. These previously recorded sites were described earlier in this document (see Previous Research, above).

Isolated Occurrences

Ten isolated occurrences were observed (Table D.1; Figure D.1). All of the lithic artifacts (n = 6) could only be tentatively identified as flaked stone. The fact that these isolated occurrences were in each case discovered on road shoulders or near the margins of cultivated fields (that is, highly disturbed areas) raises two issues. First, it is possible that in some cases an item may have been produced by machinery (such as road grading equipment or tractors) impacting naturally occurring rocks. Second, in all cases, it is highly unlikely that the artifacts are in their original locations or contexts. One artifact, a possible quartzite tool (IO 5), is the item most likely to be an actual artifact (Photo 21). Three artifacts were identified as historic or possibly historic glass; at one location, the glass was accompanied by a white earthenware plate fragment. One isolated occurrence consists of a

roadside memorial shrine (IO 10) located at the southwest corner of the intersection of Picacho Road and Arnold Road. It does not appear to be historic, but it was recorded with the intent of documenting its location for avoidance.

Walapai Canal (P-13-014813)

The Walapai Canal (assigned primary site number P-13-014813) was constructed between 1908 and 1910 (Stene 1996:9). The Walapai branched from the Yuma Main Canal at the Siphon Drop Power Plant, near the point where the Yuma Main splits from the All-American Canal. From there, it flows 3.10 km (1.93 miles) to its southern terminus. Today, the Walapai Canal appears on maps as the Walapai Lateral (see Figure D.1).

The APE crosses the Walapai Canal along Arnold Road (Photo 22). At the crossing point, the canal is of earthen construction, but there is a concrete distribution box at this location. The canal south of this point was not explored or recorded, but this distribution box appears to form the southern terminal end of the canal, except for an extension to its south measuring a few hundred feet in length paralleling First Avenue. The box measures approximately 9.1 m (30.0 feet) long by 1.8 m (6 feet) wide. It is not clear when the box was constructed, but it uses modern metal gates for its distribution openings; slots remain from the wooden gates that it once used. The canal itself is trapezoidal in cross-section (and close to triangular) and measures approximately 5.5 m (18.0 feet) at its top width with an estimated depth of about 1.5 m (5.0 feet).

Photo 21. Possible quartzite cobble tool.

Photo 22. Walapai Canal, from Arnold Road. View is to the south.

Cemetery

It was noted that the APE passes near the Fort Yuma–Quechan Indian Reservation Cemetery located at the interchange of Quechan Drive, Picacho Road, and Sapphire Lane. The APE does not encroach upon the cemetery; however, the cemetery was noted to allow for the recommendation of monitoring in the vicinity during the construction work (see Conclusions and Recommendations below).

CONCLUSION AND RECOMMENDATIONS

Tierra's Class III survey of 26.46 linear km (16.44 linear miles) of buried fiber-optic telecommunications line corridor recorded 10 isolated occurrences. No new prehistoric sites were discovered. The APE crosses two previously recorded linear sites, the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158), and the Southern Pacific Railroad (today the Union Pacific Railroad) (CA-IMP-3424). Both sites have been in continuous service since their inception and are regularly maintained. The proposed project is not expected to adversely impact either site.

Three previously recorded historic canals were updated, and one previously unrecorded historic canal was recorded. All four canals were constructed directly or indirectly as part of the Reclamation Service's (later the Bureau of Reclamation) historic Yuma Project. Due to this association, each canal may be considered to be a "unique archaeological resource," as defined by CEQA §21083.2(g)(3). Tierra therefore recommends that the canals are eligible for inclusion in the NRHP under Criterion A. However, it is emphasized that the canals are currently in active use, and as active components of the Imperial Valley agricultural infrastructure, they are regularly maintained. It is also likely that the canals have been modified to varying degrees over the years. It is therefore doubtful that the canals

retain their original integrity. It is assumed that, because they are in active use, the proposed buried fiber-optic line will avoid impacts to the canals by subsurface directional boring.

The isolated occurrences are considered to be "nonunique" archaeological resources as defined by CEQA §15064.5(c)(4) and §21083.2(h). According to these statutes, a "nonunique archaeological resource need be given no further consideration" and "the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or Environmental Impact Report, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process" (California Association of Environmental Professionals 2014:35, 134). As such, the documentation of the isolated occurrences is considered complete.

Because the canal sites, the railroad, and the transmission line are not expected to be impacted by construction, and because it is unlikely that the isolated occurrences can yield any additional information beyond that recorded during the survey, Tierra recommends that the proposed undertaking be allowed to proceed. There will be No Adverse Effect to these six cultural resources as a result of project activity (see Table 8 for a summary of management recommendations for each site). However, monitoring by a qualified archaeologist and/or Tribal member is recommended during construction work in the vicinity of the Fort Yuma–Quechan Indian Reservation Cemetery. Given the proximity of the cemetery to the APE (approximately 100 m [328 feet] to the west of the cemetery), monitoring through the APE directly parallel to the western boundary of the cemetery is recommended. Although it is unlikely that human remains will be found, monitoring will ensure proper treatment of these remains if they exist.

A Native American monitor is also recommended during all other construction activities as well. It is expected that a Native American monitor would be present during a project of this nature as a routine practice on the Fort Yuma–Quechan Indian Reservation.

Table 8. Management Recommendations

Site Designation	Eligible	Criteria	Recommended Treatment	Effect
CA-IMP-7158; Pilot Knob-Tap Drop 4 161kV Line	yes	a	avoidance	no adverse effect
CA-IMP-3424; Southern Pacific Railroad	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6830; Yuma Main Canal	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6832; Reservation Main/Cocopah Canal	yes	a	avoidance by boring underneath	no adverse effect
CA-IMP-6824; Reservation Main Drain Canal	yes	a	avoidance by boring underneath	no adverse effect
P-13-014813; Walapai Canal	yes	a	avoidance by boring underneath	no adverse effect

The clients and all subcontractors are reminded that if human remains or funerary objects are uncovered during future ground-disturbing activities, CEQA Statute 15064.5(e) requires that all work must be stopped in the area of discovery and that the coroner of the County in which the remains are discovered be contacted to determine that no investigation into the cause of death is required. If the discovery is on Indian land and the coroner determines the remains to be Native American, the Quechan Tribe shall be notified immediately to make arrangements for the disposition of the remains. If not on Indian land, the coroner shall contact the Native American Heritage Commission within 24 hours. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descendents of the deceased Native American. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of the human remains and any associated grave goods with appropriate dignity, as provided in Public Resources Code Section 5097.98.

REFERENCES

AEI Consultants
2002 *California State Historic Preservation Office—Winterhaven.* AEI Consultants, Walnut Creek, California.

Ahlstrom, Richard V. N., Annick Lascaux, and Jerry D. Lyon
2000 Past Research and Culture History. Chapter 4 in *Desert Foragers and Farmers of the Growler Valley: An Archaeological Survey of 8,065 Acres on the South Tactical Range on the Barry M. Goldwater Air Force Range in Southwestern Arizona*, edited by Richard V. N. Ahlstrom and Jerry D. Lyon. Cultural Resource Report No. 98-140. ARCADIS Geraghty and Miller Environmental Services, Phoenix, and SWCA Environmental Consultants, Inc., Tucson.

Altschul, Jeffrey H., and Joseph A. Ezzo
1995 Ceremony and Warfare along the Lower Colorado River during the Protohistoric Period. *Proceedings,* Volume 8, pp. 133–145. Society for California Archaeology, Chico.

Antevs, Ernst
1955 Geologic-climatic Dating in the West. *American Antiquity* 20 (4):317–335.

Arizona State Parks
2014 Yuma Territorial Prison State Historic Park. Available at: http://www.pr.state.az.us/parks/yute/index.html. Accessed April 16, 2014.

Baker, T. Lindsay
1978 National Register of Historic Places Inventory Nomination Form for the Ocean-to-Ocean Highway Bridge. Available at: http://pdfhost.focus.nps.gov/docs/NRHP/Text/79000431.pdf. Accessed April 17, 2014.

Barnes, Will C.
1935 *Arizona Place Names*. Reprinted 1988. University of Arizona Press, Tucson.

Bassett, Everett J.
2002 *Baja Norte/Yuma Fiber-Optic Project, Yuma County, Arizona*. Transcon Environmental, Inc., Mesa, Arizona.

Bean, Lowell John, and Sylvia Brakke Vane
1978 *Persistence and Power, A Study of Native American Peoples in the Sonoran Desert and the Devers-Palo Verde High Voltage Transmission Line*. Cultural Systems Research, Inc., Menlo Park.

Bee, Robert L.
1983 Quechan. In *Handbook of North American Indians, Volume 10: Southwest*, edited by Alfonso Ortiz, pp. 86-98. Smithsonian Institution, Washington, D.C.

Berry, Claudia F., and William S. Marmaduke
1982 *The Middle Gila Basin: An Archaeological and Historical Overview.* Northland Research, Inc., Flagstaff.

Blythe, Ashley A.
2005 *Cultural Resources Survey of Yuma Gateway Park, City of Yuma, Yuma County, Arizona.* Western Archeological and Conservation Center, Tucson.

Border Environment Cooperation Commission
2014 Bard Water District Water Conservation District. Available at: http://server.cocef.org/aproyectos/ExcomBard2003_10ing.htm. Accessed July 25, 2014.

Bostwick, Todd W.
1988 *An Investigation of Archaic Subsistence and Settlement in the Harquahala Valley, Maricopa County, Arizona.* Northland Research, Inc., Flagstaff.

Breen, Judith
2008 *A Cultural Resources Survey of a 13-Acre Parcel for the Proposed Fort Yuma Health Care Center, North of Yuma, Arizona, in Imperial County, California.* Logan Simpson Design, Inc., Phoenix.

Bureau of Indian Affairs (BIA)
1996 *Determination of No Historic Properties for Fyir Consolidated No. 4 (Additional Coverage).* Bureau of Indian Affairs, Washington D.C.

Bureau of Land Management (BLM)
2001 *Draft Northern & Eastern Colorado Desert Coordinated Management Plan and Environmental Impact Statement—An Amendment to the California Desert Conservation Area Plan 1980 and Sikes Act Plan with the California Department of Fish and Game.* Bureau of Land Management, California Desert District Office, Riverside.

2013 World War II Desert Training Center, California-Arizona Maneuver Area. Available at: http://www.blm.gov/ca/st/en/fo/needles/patton.html. Accessed April 17, 2014.

2014 General Land Office Records. Available at: http://www.glorecords.blm.gov/. Accessed on July 25, 2014.

Bureau of Reclamation (BOR)
2009 Laguna Diversion Dam. Available at: http://www.usbr.gov/projects/Facility.jsp?fac_Name=Laguna%20Diversion%20Dam. Accessed April 17, 2014.

California Association of Environmental Professionals
2014 *California Environmental Quality Act (CEQA) Statute and Guidelines*. California Association of Environmental Professionals, Palm Desert.

Chipman, Donald E.
1987 In Search of Cabeza de Vaca's Route across Texas: An Historiographical Survey. *Southwestern Historical Quarterly,* XCI(2):175–186.

Crozier, S. Neal
1993 *Historic Property Survey of Bureau of Indian Affairs Road Project Fyir Consolidated No. 4, Fort Yuma Indian Reservation, Imperial County, California*. Unpublished Report on file at South Coastal Information Center, San Diego State University.

Curtis, Edward S.
1906 The Yuma. In *The North American Indian: Volume 2*. Electronic version available at http://www.worldwisdom.com/public/viewpdf/default.aspx?article-title=The_Yuma_Tribe_by_Edward_Curtis.pdf. Accessed January 21, 2015.

Davis, Erin, and Tina Hart
2013 *A Cultural Resources Survey of 8200 Linear Feet (9.80 Acres) for the Quechan Indian Tribe's Sewer Line "F" Improvements, Winterhaven, Fort Yuma Indian Reservation, Imperial County, California*. Logan Simpson Design, Inc., Phoenix.

DeMaagd, Holly
1999 *Cultural Resources Survey along Interstate 8 between Mileposts 0.0 and 3.0, Yuma, Yuma County, Arizona.* Archaeological Consulting Services, Ltd., Tempe, Arizona.

Doak, David P.
1994 *Archaeological Monitoring of a Natural Gas Line Replacement Operation in Yuma, Yuma County, Arizona*. Archaeological Report 94-149. SWCA Environmental Consultants, Inc., Phoenix.

1999 *Archaeological Survey for a Proposed Fiber-Optic Cable Line from Yuma to Phoenix, Arizona*. Cultural Resources Report No. 99-185. SWCA Environmental Consultants, Inc., Tucson.

Drive the Old Spanish Trail
2014 OST Highlights: Arizona. Available at: http://www.drivetheost.com/az.html. Accessed on April 17, 2014.

Duncan, Heather D., and Craig M. Fertelmes
2007 *Class III Cultural Resources Survey—Quechan Tribal Housing Scattered Sites Program Project*. Transcon Environmental, Mesa.

Erickson, Kirsten
2010 *Cultural Resource Survey for Verizon Wireless Telecommunications Project AZ4 Yuma North, Yuma, Yuma County, Arizona*. Cultural Resource Report No. 2010-11(AZ). URS Corporation, Phoenix.

Flint, Richard, and Shirley Cushing Flint
2004 Melchior Diaz. Available at: www.newmexicohistory.org. Accessed on April 25, 2012.

Grayson, Donald K., and David J. Meltzer
2003 A Requiem for North American Overkill. *Journal of Archaeological Science* 30:585–593.

Green, Eileen, and Joan Middleton
1994 *Cultural Resource Overview, All-American Canal Lining Project, Final Report*. Bureau of Reclamation, Washington D.C.

Greystone Environmental Consultants
2005 *Desert Southwest Transmission Line Project Final Environmental ImpactStatement/ Environmental Impact Report (EIS/EIR)*. Greystone Environmental Consultants, Inc., Greenwood Village, Colorado.

Gumerman, George J., and Carol S. Weed
1973 *Archaeological Survey, Yuma County, Arizona, Colorado River International Salinity Control Project*. Prescott College, Prescott, Arizona.

Guthrie, R. Dale
2006 New Carbon Dates Link Climatic Change with Human Colonization and Pleistocene Extinctions. *Nature* 441(7090):207–210.

Halpern, A. M.
1997 *Ka?úk: Native Accounts of the Quechan Mourning Ceremony*. University of California Publications in Linguistics, Volume 128. University of California Press, Berkeley and Los Angeles.

Hart, Herbert M.
2014 Historic California Posts: Fort Yuma. Available at: http://www.militarymuseum.org/FtYuma.html. Accessed on April 16, 2014.

Hartmann, Gayle H.
1986 Cultural Resources. In *Natural Resources Management Plan for Luke Air Force Range*. College of Agriculture, University of Arizona, Tucson.

Hartmann, Gayle H., and Mary Charlotte Thurtle (editors)
2000 *The Only Water for 100 Miles. Volume II: The Tinajas Altas Archaeological Survey*. Cultural Resource Survey Report No. 98-270. SWCA Environmental Consultants, Inc., Tucson, and Arcadis, Geraghty, & Miller, Phoenix.

Haury, Emil W.
1950 *The Stratigraphy and Archaeology of Ventana Cave*. University of Arizona Press, Tucson.

1953 Discovery of the Naco Mammoth and the Associated Projectile Points. *American Antiquity* 19:1–14.

1976 *The Hohokam: Desert Farmers and Craftsmen. Excavations at Snaketown, 1964–1965*. University of Arizona Press, Tucson.

Haury, Emil W., E. B. Sayles, and William W. Wasley
1959 The Lehner Mammoth Site, Southeastern Arizona. *American Antiquity* 25:2–42.

Hayden, Julian D.
1976 Pre-Altithermal Archaeology in the Sierra Pinacate, Sonora, Mexico. *American Antiquity* 41(3):274–289.

Haynes, C. Vance
1970 Archaeological Investigations at the Murray Springs Clovis Site, Arizona, 1970. In *National Geographic Society Research Reports, 1970 Projects*. National Geographic Society, Washington D.C.

Haynes, Gary, and B. Sunday Eiselt
1997 The Power of Pleistocene Hunter-Gatherers: A Forward and Backward Search for Evidence about Mammoth Extinction. Paper delivered at the American Museum of Natural History's Spring Symposium, "Humans and Other Catastrophes," New York.

Hesse, S. Jerome
2008 *An Archaeological Survey for the EPNG Line 2123 Make Piggable Project, La Paz and Yuma counties, Arizona*. Cultural Resource Report No. 07-487. SWCA Environmental Consultants, Inc., Tucson.

Hester, James J.
1972 *Blackwater Locality No.1: A Stratified Early Man Site in Eastern New Mexico*. Fort Burgwin Research Center Paper No.8. Southern Methodist University, Dallas.

Heuberger, Jurg
n.d. *Imperial County General Plan: Overview*. Planning & Development Services Department, County of Imperial, El Centro, California.

Huckell, Bruce B.
1979 *The Coronet Real Project: Archaeological Investigations on the Luke Range, Southwestern Arizona*. Archaeological Series No. 129. Arizona State Museum, University of Arizona, Tucson.

1984 The Paleo-Indian and Archaic Occupation of the Tucson Basin: An Overview. *Kiva* 49:133–145.

1995 *Of Marshes and Maize: Preceramic Agricultural Settlements in the Cienega Valley, Southeastern Arizona*. Anthropological Papers No. 59. University of Arizona Press, Tucson.

1996 The Archaic Prehistory of the North American Southwest. *Journal of World Prehistory* 10:305–373.

1998 Alluvial Stratigraphy of the Santa Cruz Bend Reach. In *Archaeological Investigations of Early Village Sites in the Middle Santa Cruz Valley,* edited by Jonathan B. Mabry, pp. 31–56. Anthropological Papers No. 19. Center for Desert Archaeology, Tucson.

Imperial Irrigation District
2014 All-American Canal. Available at: http://www.iid.com/index.aspx?page=177. Accessed on July 25, 2014.

Irwin-Williams, Cynthia
1979 Post-Pleistocene Archeology, 67,000–2,000 B.C. In *Southwest,* edited by Alfonso Ortiz, pp. 31–42. Handbook of North American Indians, Vol. 9, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Jackman, Karolyn
2000 *A Cultural Resources Survey for Improvements at the Yuma Territorial Prison State Park, Yuma County, Arizona.* Archaeological Consulting Services, Ltd., Tempe, Arizona.

Jensen, Karolyn Jackman, Margaret Glass, and Catherine B. Johnson
1999 *Salvage Excavations in the New Yard at Yuma Territorial Prison State Historic Park, Yuma, Yuma County, Arizona.* Archaeological Consulting Services, Ltd., Tempe, Arizona.

Jones & Stokes Associates
1999 *Cultural Resources Inventory Report for Williams Communications, Inc.: Fiber-Optic Cable System Installation Project, Riverside, California, to the California/Arizona Border, Riverside, San Bernardino, and Imperial County, California.* Jones & Stokes Associates, Inc., Sacramento.

2000 *Final Cultural Resources Inventory for Williams Communications, Inc.: Fiber-Optic Cable System Installation Project, Riverside, California to the California/Arizona Border, Riverside, San Bernardino, and Imperial Counties, California.* Jones & Stokes Associates, Inc., Sacramento.

Kinkade, Gay M.
2003 *Determination Of No Historic Properties Affected—Project No. Fmir 102 (1).* Bureau of Indian Affairs, Washington D.C.

Kroeber, A.L.
1976 *Handbook of the Indians of California.* Reprinted. Dover Publications, Inc., New York. Originally published 1925, Bulletin 78, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

Mariella, Patricia S.
1983 *The Political Economy of Federal Resettlement Policies Affecting Native American Communities: The Fort McDowell Yavapai Case*. Ph.D. Dissertation, Department of Anthropology, Arizona State University, Tempe.

Martin, Paul S.
1967 Prehistoric Overkill. In *Pleistocene Extinctions: The Search for a Cause*, by Paul S. Martin and H. E. Wright, Jr., pp. 75–120. Yale University Press, New Haven and London.

Maxon, James
1984 *Proposed Yuma Division Dredge Spoil*. Unpublished Report on file at South Coastal Information Center, San Diego State University, San Diego.

McCorkle, Thomas
1978 Intergroup Conflict. In *Handbook of North American Indians, Volume 8: California*, edited by Robert F. Heizer, pp. 694–700. Smithsonian Institution, Washington, D.C.

McDonald, Meg, and Ken Victorino
1997 *Archaeological Survey of Two Segments of the Interstate 8 Right-of-Way, Imperial County, California*. ASM Affiliates, San Diego.

McGuire, Randall H.
1982 Problems in Culture History. Chapter 2 in *Hohokam and Patayan: Prehistory of Southwestern Arizona*, edited by Randall H. McGuire and Michael B. Schiffer. Academic Press, New York.

McVey, Rodney
2014 July 22nd Letter to Barbara K. Montgomery, Principal Investigator, Tierra Right of Way Services, from Rodney McVey, Deputy Regional Director, Western Regional Office, Bureau of Indian Affairs, Phoenix.

Meyer, Donna M.
2011 *Emergency Back-Up Generator, Quechan Tribal Police Department Building, Winterhaven, Imperial County, California*. Federal Emergency Management Agency, Washington D.C.

Mitchell, Douglas R.
1994 *Archaeological Survey for the Yuma Loop Line Line Replacement Project, Yuma County, Arizona*. Archaeological Report No. 94-26. SWCA Environmental Consultants, Inc., Scottsdale, Arizona.

Moreno, Jerryll, Dawn Snell, and Renee Kolvet
1995 *Intensive Cultural Resource Inventory for the Western Area Power Administration Gila-Knob 161-Kv Transmission Line, Imperial County, California and Yuma County, Arizona*. Western Cultural Resource Management, Inc., Boulder, Colorado.

Myers, Laural
2005 *Determination of No Adverse Effect—Fyir Ir 31 Quechan Drive Encroachment*. Aztlan Archaeology, Inc., Tucson.

Nash-Chrabascz, Bridget
2009 *Cultural Resources Survey for the Jackson Homesite on Picacho Road Fort Yuma Quechan Indian Reservation*. Quechan Indian Tribe, Winterhaven, California.

National Park Service (NPS)
1990 *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Department of the Interior, National Park Service, Washington, D.C.

2014 Laguna Dam District, Arizona. Available at: http://www.nps.gov/nr/travel/ReclamationDamsAndWaterProjects/Laguna_Dam_District.html. Accessed on August 6, 2014.

OHP (Office of Historic Preservation)
1995 *Instructions for Recording Historical Resources*. California Office of Historic Preservation, Sacramento.

O'Mack, Scott
2002 *Archaeological and Historical Evaluation of a Contaminated Soil Removal Area in Yuma, Arizona*. Technical Report 02-01. Statistical Research, Inc., Tucson.

Pfaff, Christine, Rolla Queen, and David Clark
1992 *The Historic Yuma Project*. Bureau of Reclamation, Washington D.C.

Prescott College
1973 *Archaeological Survey of the Yuma Division Colorado River Front Work and Levee System*. Prescott College, Prescott, Arizona.

Rea, Amadeo M.
1997 *At the Desert's Green Edge: An Ethnobotany of the Gila River Pima.* University of Arizona Press, Tucson.

Reid, J. Jefferson, and Stephanie Whittlesey
1997 *The Archaeology of Ancient Arizona*. University of Arizona Press, Tucson.

Rogers, Malcolm J.
1939 *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas*. Paper No. 3. San Diego Museum, San Diego.

1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1:167–198.

1966 *Ancient Hunters of the Far West*. Union-Tribune, San Diego.

Rosen, Martin
1993 *Historic Property Survey Report Interstate 8 Seismic Retrofit Project in Imperial County, California, And Yuma County, Arizona*. California Department of Transportation, Los Angeles.

Roxlau, Katherine, and John Acklen
1995 *A Cultural Resource Inventory for the Proposed Quechan Indian Casino Fort Yuma Indian Reservation, Yuma County, Arizona and Imperial County, California*. TRC Mariah Associates, Inc., Albuquerque.

Sander, Jay, and Patrick Maxon
2007 *Phase I Cultural Resources Reconnaissance For The Union Pacific Railroad, Yuma Subdivision Capacity Project, Riverside And Imperial Counties, California—Revised Draft*. Chambers Group, Inc., El Centro, California.

Sauer, Carl O.
1971 *Sixteenth Century North America*. University of California Press, Berkeley.

Sayles, E. B.
1983 *The Cochise Cultural Sequence in Southeastern Arizona*. Anthropological Papers No. 42. University of Arizona Press, Tucson.

Sayles, E. B., and Ernst Antevs
1941 *The Cochise Culture*. Medallion Paper No. 29. Gila Pueblo, Globe, Arizona.

Schaefer, Jerry, and Mark Becker
2007 *The Search for Archaeological Remains of the Southern Pacific Railroad Bridge Across the Colorado River, Yuma Crossing National Heritage Area, Arizona*. ASM Affiliates, San Diego.

Schaefer, Jerry, and Collin O'Neill
1998 *A Cultural Resources Inventory and Evaluation of the Imperial Irrigation District's Usoline Pole Replacement Project, Imperial County, California*. ASM Affiliates, San Diego.

2001 *The All-American Canal: An Historic Properties Inventory and Evaluation*. ASM Affiliates, San Diego.

Schroeder, Albert H.
1957 The Hakataya Cultural Tradition. *American Antiquity* 23:176–178.

1979 Prehistory: Hakataya. In *Southwest*, edited by Alfonso Ortiz, pp. 100–107. Handbook of North American Indians Vol. 9, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Singer, Eugene
2014 Ancient Lake Cahuilla. Available at: http://www.sci.sdsu.edu/salton/AncientLakeCahuilla.html. Accessed on July 22, 2014.

Smith, Ian Michael
2010 From Subsistence to Dependence: The Legacy of Reclamation and Allotment on Quechan Indian Lands, 1700–1940. Master's thesis, University of Montana, Missoula.

Spicer, Edward H.
1962 *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533-1960*. University of Arizona Press, Tucson.

State of California
2013 Fort Yuma Historical Landmark. Available at: http://ohp.parks.ca.gov/ListedResources/Detail.aspx?num=806. Accessed April 16, 2014

Steadman, David W., P. S. Martin, R. D. E. MacPhee, A. J. T. Jull, H. G. McDonald, C. A. Woods, M. Iturralde-Vinent, and G. W. L. Hodgins
2005 Asynchronous Extinction of Late Quaternary Sloths on Continents and Islands. *Proceedings of the National Academy of Sciences* 102:11763–11768.

Stene, Eric A.
1996 Yuma Project and Yuma Auxiliary Project. Available at: http://www.usbr.gov/projects//ImageServer?imgName=Doc_1305647328311.pdf. Accessed April 17, 2014.

Sterner, Matthew A.
1998 *Class III Cultural Resources Inventory and Evaluation of Phase II Dredge Spoil Disposal Areas, Yuma County, Arizona.* Statistical Research, Inc., Tucson.

Stewart, Kenneth M.
1983a Yumans: Introduction. In *Handbook of North American Indians, Volume 10: Southwest*, edited by Alfonso Ortiz, pp. 1–3. Smithsonian Institution, Washington, D.C.

1983b Mohave. In *Handbook of North American Indians, Volume 10: Southwest*, edited by Alfonso Ortiz, pp. 55–70. Smithsonian Institution, Washington, D.C.

Stone, Lyle M.
1983 *Yuma Crossing and Associated Sites National Historic Landmark : An Archaeological Perspective.* Archaeological Research Services, Inc., Tempe, Arizona.

Stone, Lyle, and Jeffrey Hathaway
1990 *Archaeological Resources of the Fort Yuma Indian Reservation Portion of Yuma Crossing National Historic Landmark in Imperial County, California and Yuma County, Arizona.* Archaeological Research Services, Inc., Tempe, Arizona.

Swarthout, Jeanne, and Christopher E. Drover
1981 *Final Report for an Archaeological Overview for the Lower Colorado River Valley, Arizona, Nevada, and California—Reach 3—Davis Dam to the International Border.* Museum of Northern Arizona, Department of Archaeology, Flagstaff.

SWCA Environmental Consultants, Inc. (SWCA)
2006 *Volume I: Cultural Resources Final Reportof Monitoring and Findings for the Qwest Network Construction Project, State of California.* SWCA Environmental Consultants, Inc., Phoenix.

Tierra Madre Consultants, Inc.
1998 *Imperial Irrigation Distrist USO Line, Biological Survey.* Tierra Madre Consultants, Inc., Riverside, California.

Toulouse, Julian Harrison
1971 *Bottle Makers and Their Marks.* Thomas Nelson, Inc., New York.

TRC Mariah Associates, Inc.
1995 *Environmental Assessment for Quechan Casino at Fort Yuma Indian Reservation California and Arizona.* TRC Mariah Associates, Inc., Albuquerque.

Underwood, Jackson
2010 *Cultural Resource Survey for the Quechan Community Water Storage Tank Alternative Sites Fort Yuma Quechan Reservation, Imperial County, California.* Tierra Environmental Services, Inc., San Diego.

2011 *Cultural Resource Survey for the Agnes Road and the Sapphire Lane Realignment Projects Imperial County, California.* Tierra Environmental Services, Inc., San Diego.

U.S. Army
2014 Yuma Proving Ground Continues Area's Army History. Available at: http://www.yuma.army.mil/History/Overview.aspx. Accessed April 17, 2014.

U.S. Department of Agriculture (USDA)
2014 Web Soil Survey. Available at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx. Accessed on July 21, 2014.

U.S. Fish and Wildlife Service
n.d. El Camino del Diablo: Highway of the Devil. Available at: http://www.fws.gov/southwest/refuges/arizona/diablo.html. Accessed on April 25, 2012.

Van Citters: Historic Preservation
2006 Historic Preservation Plan—Phoenix Area Indian Health Service. Van Citters: Historic Preservation, LLC, Albuquerque.

Van Devender, Thomas R., and Geoffrey Spaulding
1979 Development of Vegetation and Climate in the Southwestern United States. *Science* 204:701–710.

Von Werlhof, Jay
1996 *Archaeological Investigations of Picacho Road and Yuma Main Canal Bridge, No. 58c0028*. Imperial Valley College Desert Museum, Ocotillo, California.

2002a *VGS Sewer Line from Yuma Lift Station Toquechan Community Center*. Imperial Valley College Desert Museum, Ocotillo, California.

2002b *Water Pipeline from Jackson Road Well to Pichacho Road Well*. Imperial Valley College Desert Museum, Ocotillo, California.

2002c *Archaeological Examinations of the Realigned Sewer Project Phase 2*. VGS Project A71, Supplement. Imperial Valley College Desert Museum, Ocotillo, California.

2002d *Archaeological Examinations of the Re-Aligned VGS Sewer Line*. Imperial Valley College Desert Museum, Ocotillo, California.

Walker, Henry P., and Don Bufkin
1979 *Historical Atlas of Arizona*. University of Oklahoma Press, Norman.

Walsh, Mary-Ellen
2013 *A Class III Cultural Resources Survey For A Proposed Water And Sewer Line Construction Project In Winterhaven, Fort Yuma Indian Reservation, Imperial County, California*. Logan Simpson Design, Inc., Phoenix.

Waters, Michael R.
1982a The Lowland Patayan Ceramic Tradition. In *Hohokam and Patayan: Prehistory of Southwestern Arizona*. edited by Randall H. McGuire and Michael B. Schiffer, pp. 275–297. Academic Press, New York.

1982b The Lowland Patayan Ceramic Typology. In *Hohokam and Patayan: Prehistory of Southwestern Arizona*, edited by Randall McGuire and Michael B. Schiffer, pp. 537–570. Academic Press, New York.

Waters, Michael R., and Thomas W. Stafford, Jr.
2007 Redefining the Age of Clovis: Implications for the Peopling of the Americas. *Science* 315:1122–1126.

Weber, David J.
1992 *The Spanish Frontier in North America*. Yale University Press, New Haven, Connecticut.

Whalen, Norman M.
1971 *Cochise Culture Sites in the Central San Pedro Drainage, Arizona*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Arizona, Tucson.

1974 *Archaeological Survey in Southeastern Imperial County, California; An Abstract*. Imperial Valley College Desert Museum, Ocotillo, California.

Wilcox, Ray
1993 *Archaeological/Historical Clearance: Project Ca 54-14*. Imperial Valley College Desert Museum, Ocotillo, California.

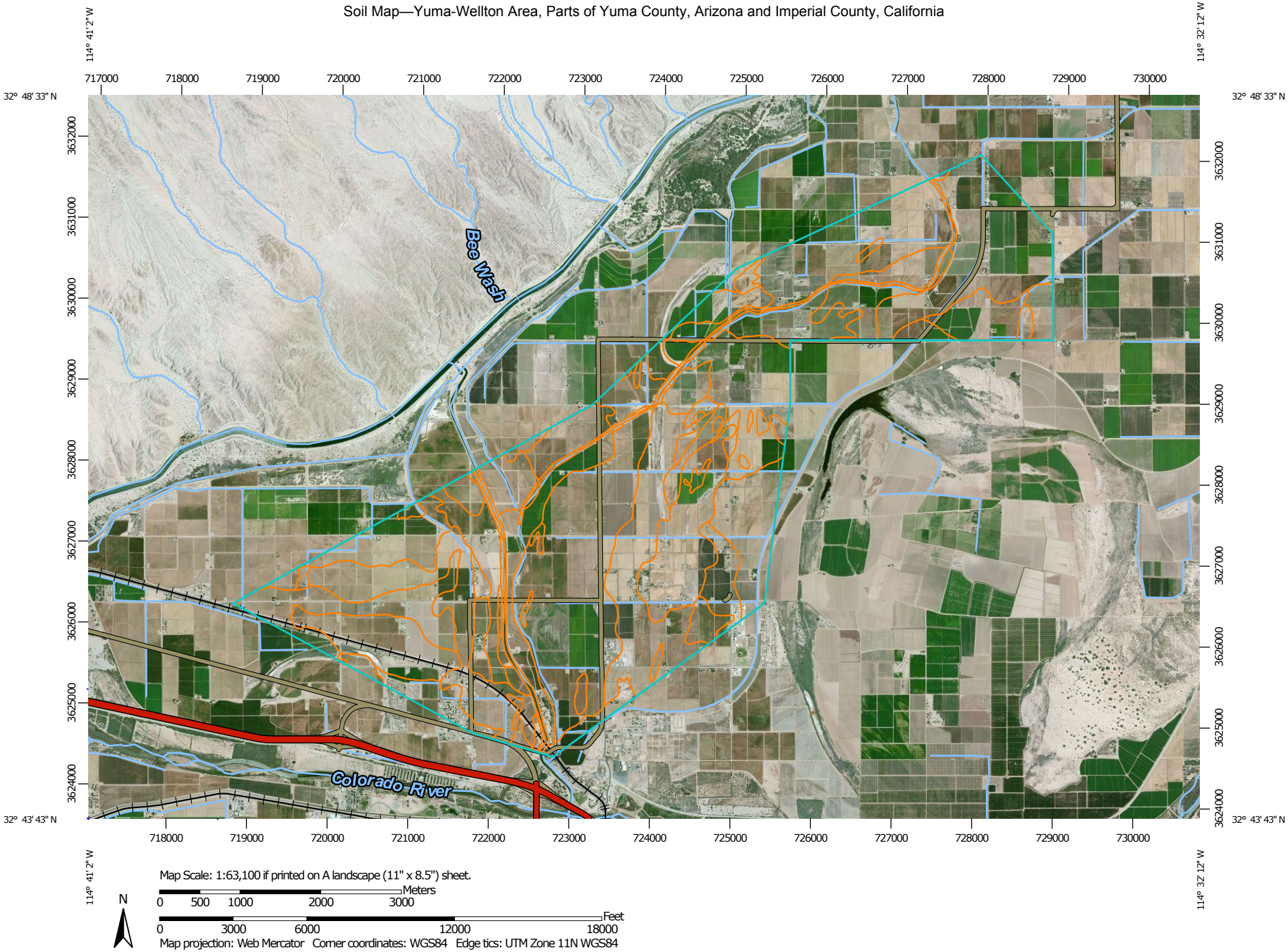
Willey, Gordon R., and Philip Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

Wisner, George B.
1997 On the Trail of the First Americans: Monte Verde Marks a New Dawn for an Old Debate. *American Archaeology* 1(2):12–17.

Yost, Stephen W., Michael Mirro, Lori Rhodes, J. David Ing, and Howard Higgins
2001 *Final Report On Cultural Resuorce Monitoring along the Level (3) Long Haul Fiber-Optic Running Line, San Diego, California to Yuma, Arizona, San Diego and Imperial Counties*. TRC Mariah Associates, Inc., Albuquerque.

APPENDIX A. SOIL TYPES

Soil Map—Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 29, 2011—May 30, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California (AZ649)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
8	Gadsden clay	1,408.9	21.7%
10	Glenbar silty clay loam	14.2	0.2%
12	Holtville clay	1,858.7	28.7%
13	Indio silt loam	950.6	14.7%
17	Kofa clay	1,604.1	24.7%
18	Lagunita loamy sand	70.5	1.1%
19	Lagunita silt loam	13.9	0.2%
24	Ripley silt loam	472.9	7.3%
35	Water	93.9	1.4%
Totals for Area of Interest		**6,487.6**	**100.0%**

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

8—Gadsden clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Gadsden and similar soils: 100 percent

Description of Gadsden

Setting

Landform: Flood plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 10 inches: clay
C - 10 to 60 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Very slightly saline to moderately saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 60.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

10—Glenbar silty clay loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Glenbar and similar soils: 100 percent

Description of Glenbar

Setting

Landform: Terraces, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

Ap - 0 to 16 inches: silty clay loam
C - 16 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 50.0
Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

12—Holtville clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Holtville and similar soils: 100 percent

Description of Holtville

Setting

Landform: Flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 13 inches: clay
C1 - 13 to 23 inches: clay
2C2 - 23 to 75 inches: stratified silty clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to strongly saline (2.0 to 32.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

13—Indio silt loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Indio and similar soils: 100 percent

Description of Indio

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
C - 6 to 63 inches: stratified very fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: High (about 10.8 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated and reclaimed of excess salts and sodium
Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

17—Kofa clay

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Kofa and similar soils: 100 percent

Description of Kofa

Setting

Landform: Flood plains, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

Ap - 0 to 12 inches: clay
C1 - 12 to 28 inches: clay
2C2 - 28 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

19—Lagunita silt loam

Map Unit Setting

Elevation: 100 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Lagunita and similar soils: 100 percent

Description of Lagunita

Setting

Landform: Alluvial fans, terraces, drainageways, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

A - 0 to 12 inches: silt loam
C - 12 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 5.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

18—Lagunita loamy sand

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Lagunita and similar soils: 100 percent

Description of Lagunita

Setting

Landform: Terraces, alluvial fans, flood plains, drainageways
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent mixed alluvium

Typical profile

A - 0 to 8 inches: loamy sand
C - 8 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 30.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California

24—Ripley silt loam

Map Unit Setting

Elevation: 80 to 600 feet
Mean annual precipitation: 0 to 0 inches
Mean annual air temperature: 72 to 76 degrees F
Frost-free period: 250 to 325 days

Map Unit Composition

Ripley and similar soils: 100 percent

Description of Ripley

Setting

Landform: Terraces, flood plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

Ap - 0 to 6 inches: silt loam
C1 - 6 to 25 inches: very fine sandy loam
2C2 - 25 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 13.0
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Data Source Information

Soil Survey Area: Yuma-Wellton Area, Parts of Yuma County, Arizona and Imperial County, California
Survey Area Data: Version 9, Dec 15, 2013

APPENDIX B

Class I Research

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX C

Site Forms

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX D

Results

CONFIDENTIAL

This appendix contains information on the locations of cultural properties discussed in the report:

A Class III Cultural Resource Survey for a Proposed Telecommunications Fiber-Optic Line Installation, in Imperial County, California

APPENDIX F. LETTER FROM THE QUECHAN HISTORIC PRESERVATION OFFICER

Quechan Indian Tribe

Historic Preservation Office
350 Picacho Road
Winterhaven, CA 92283
760/572-0213

May 16, 2014
Tierra Right of Way Services, Ltd.
1575 East River Road
Tucson, AZ 85718

SUBJECT: Permission to Release Date to Tierra Right of Way Services, Ltd for TDS Telecom CASF Winterhaven Fiber Project

To Whom It May Concern:
Tierra Right of Way Services, Ltd has permission to receive information from CA SHPO/CHRIS on any previous archeological surveys and previous listed archeological sites on the Quechan Indian Reservation.

Thank you,

Arlene F. Kingery
Historic Preservation Officer

APPENDIX G. ADDENDUM TO A CLASS III CULTURAL RESOURCES SURVEY FOR A PROPOSED BURIED TELECOMMUNICATIONS FIBER-OPTIC LINE NEAR WINTERHAVEN, IN IMPERIAL COUNTY, CALIFORNIA

INTRODUCTION

In February of 2015, TDS introduced six minor changes to the route of the proposed fiber-optic line. Five of these changes consist of short extensions of the line at various points along the route, and one consists of moving a segment of the proposed line a short distance to the west of its originally proposed location. These changes necessitated that an addition to the Class III survey, which was conducted in July of 2014, be completed. This addendum will describe the changes to the route and the results of the additional Class III survey.

The additional survey was conducted on March 12, 2015, by Joseph Howell, M.A. (field director). Mr. Henri Koteen again served as monitor for the Quechan Tribe. The fiber-optic line extensions are located at the intersections of Railroad Avenue and G Street (in Winterhaven); Foster Road and Arnold Road; Jackson Road and Picacho Road; Baseline Road and Haughtelin Road; and Ross Road and Levee Road (south of Bard). The relocated segment lies along Cocopah Road. The total combined length of the changes is 2.63 km (1.64 miles), with a total area of 8.0 ha (19.8 acres). All of the lines examined during the survey are located along graded road shoulders or berms, and, with the exception of historic canal laterals (discussed in greater depth below), no cultural resources were located during the survey. Most locations also appear to coincide with or are parallel to previously installed buried utilities. Each of the extensions and the relocated segment is described in greater detail below. An overview of the changes can be seen in Figures G.1–G.4. Figures G.2–G.4 provide views at the scale of 1:24,000.

RESULTS OF ADDITIONAL SURVEY

Extension No. 1

Extension No. 1 is located in the Town of Winterhaven (Figure G.5). It begins on the west shoulder of Railroad Avenue adjacent to the TDS building (Photo G.1). It then proceeds north to G Street and continues along the north side of that street to 1st Avenue (Photo G.2). The extension totals about 311 m (1,020 feet) in length. No cultural resources were located within this extension.

Extension No. 2

Extension No. 2 is located along the western shoulder of Foster Road, beginning at the intersection with Arnold Road and extending south for approximately 50 m (164 feet) (Figure G.6; Photo G.3). No cultural resources were located within this extension.

Extension No. 3

Extension No. 3 begins at Picacho Road and extends west for approximately 199 m (653 feet) along Jackson Road, ending near the southeast corner of a private lot (Figure G.7; Photo G.4). No cultural resources were located within Extension No. 3.

Extension No. 4

Extension No. 4 begins at a point along the northern shoulder of Haughtelin Road east of the Baseline Road intersection (Figure G.8; Photo G.5). From this point, it continues west and turns south at the intersection, continuing along the eastern shoulder of Baseline Road (Photo G.6). The total length of the extension is 161 m (528 feet).

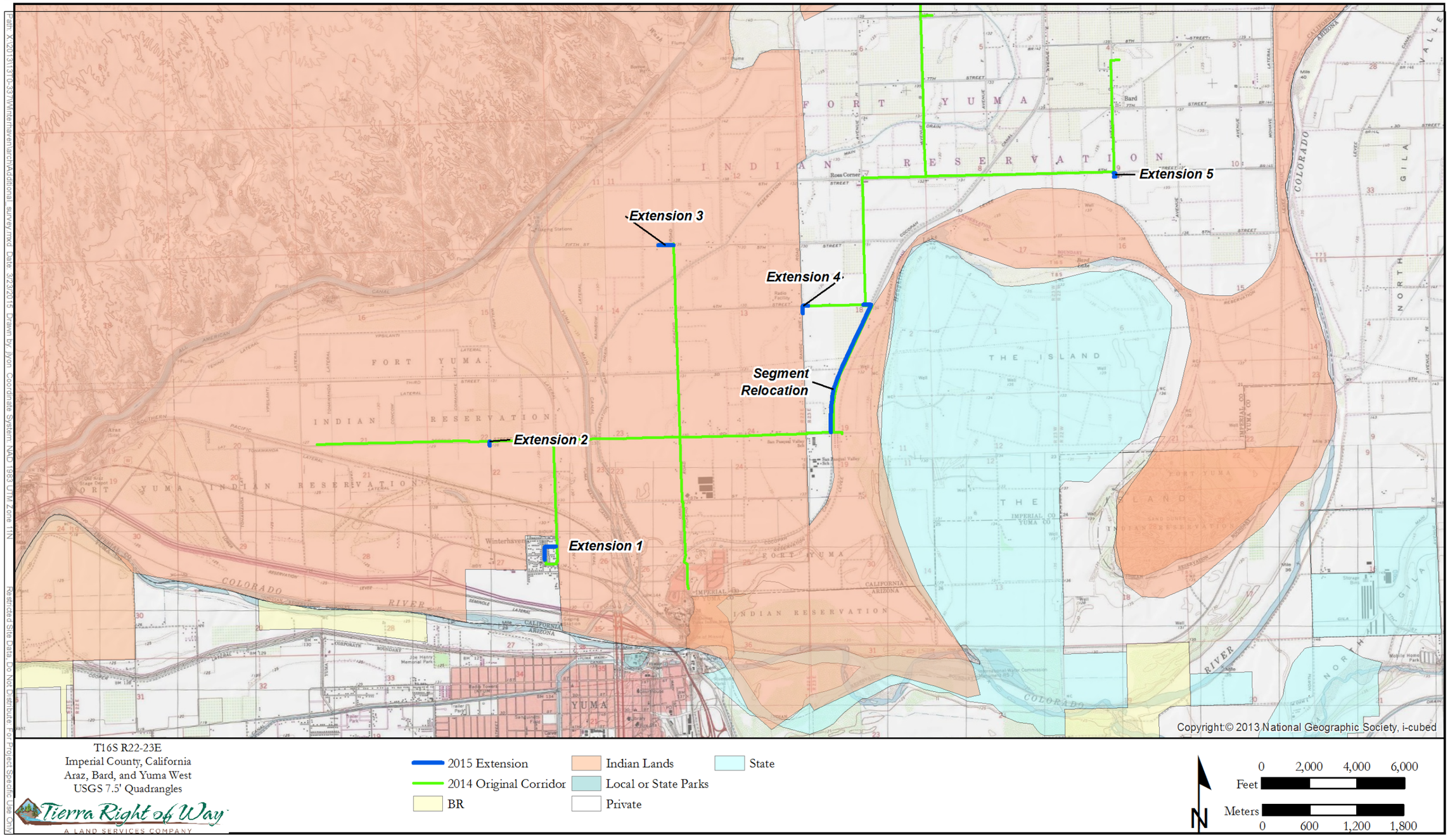


Figure G.1. Location of the original project corridor and the subsequent route extensions and relocated segment.

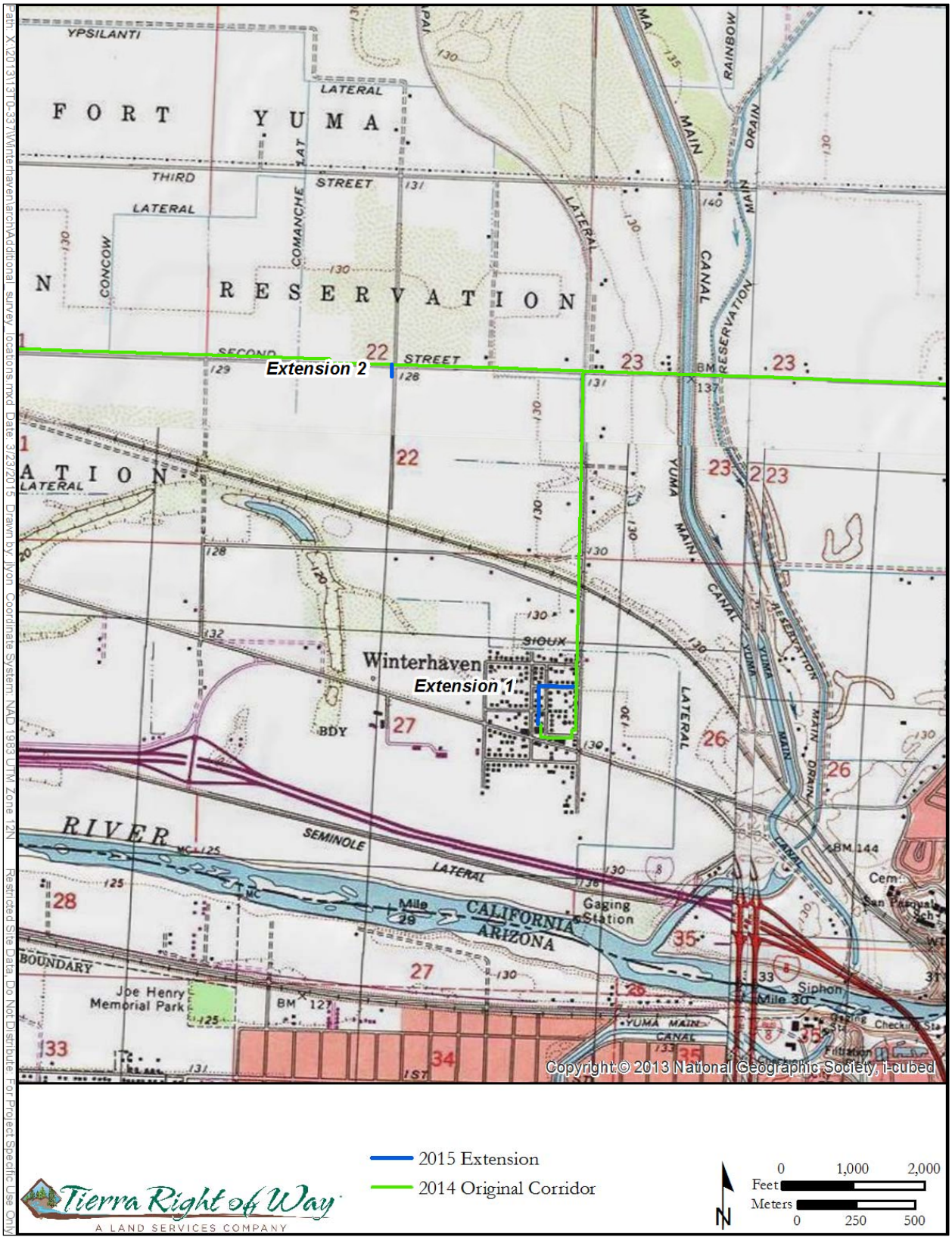


Figure G.2. Location of Extensions No. 1 and No. 2.

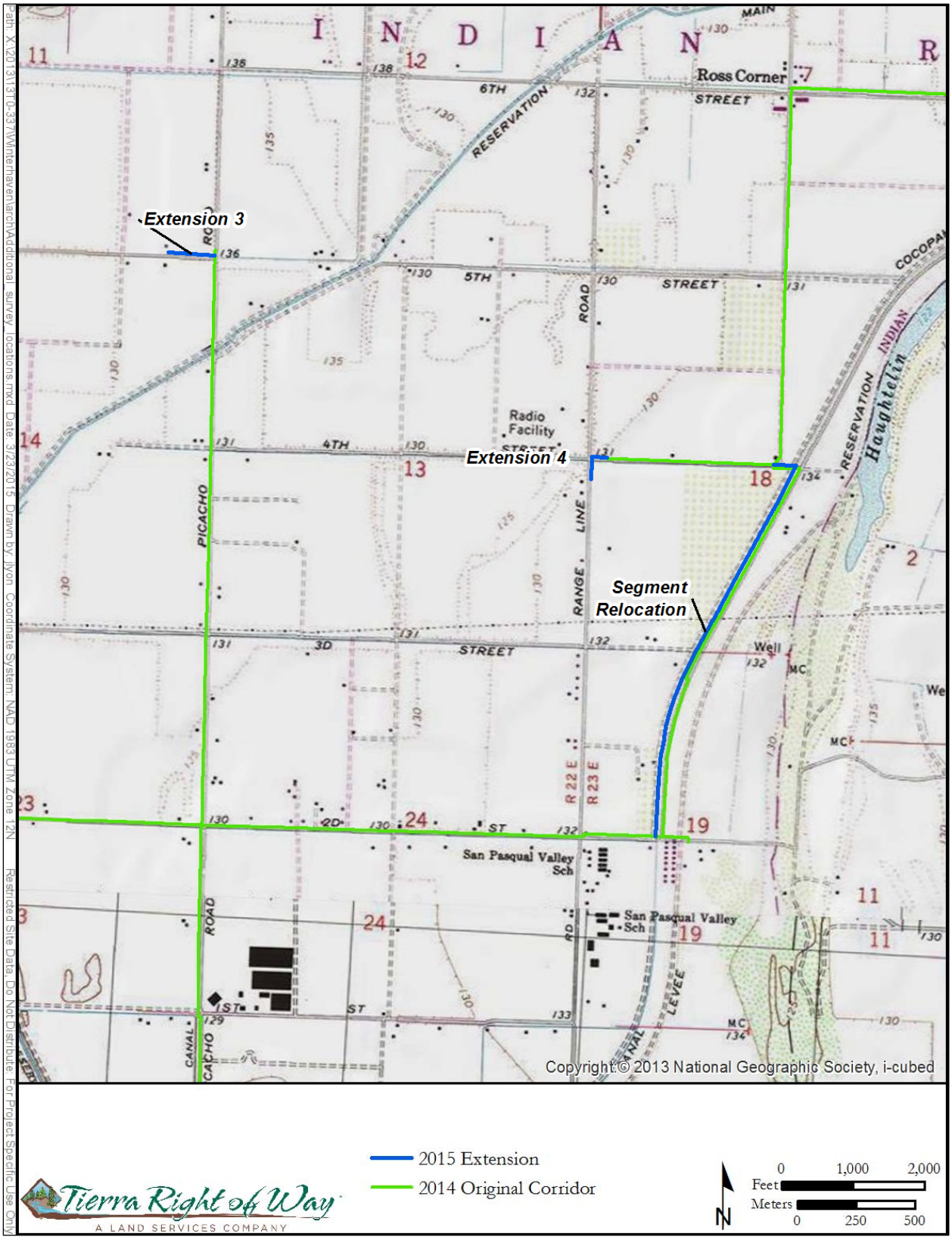


Figure G.3. Location of Extensions No. 3 and No. 4, and relocated segment.

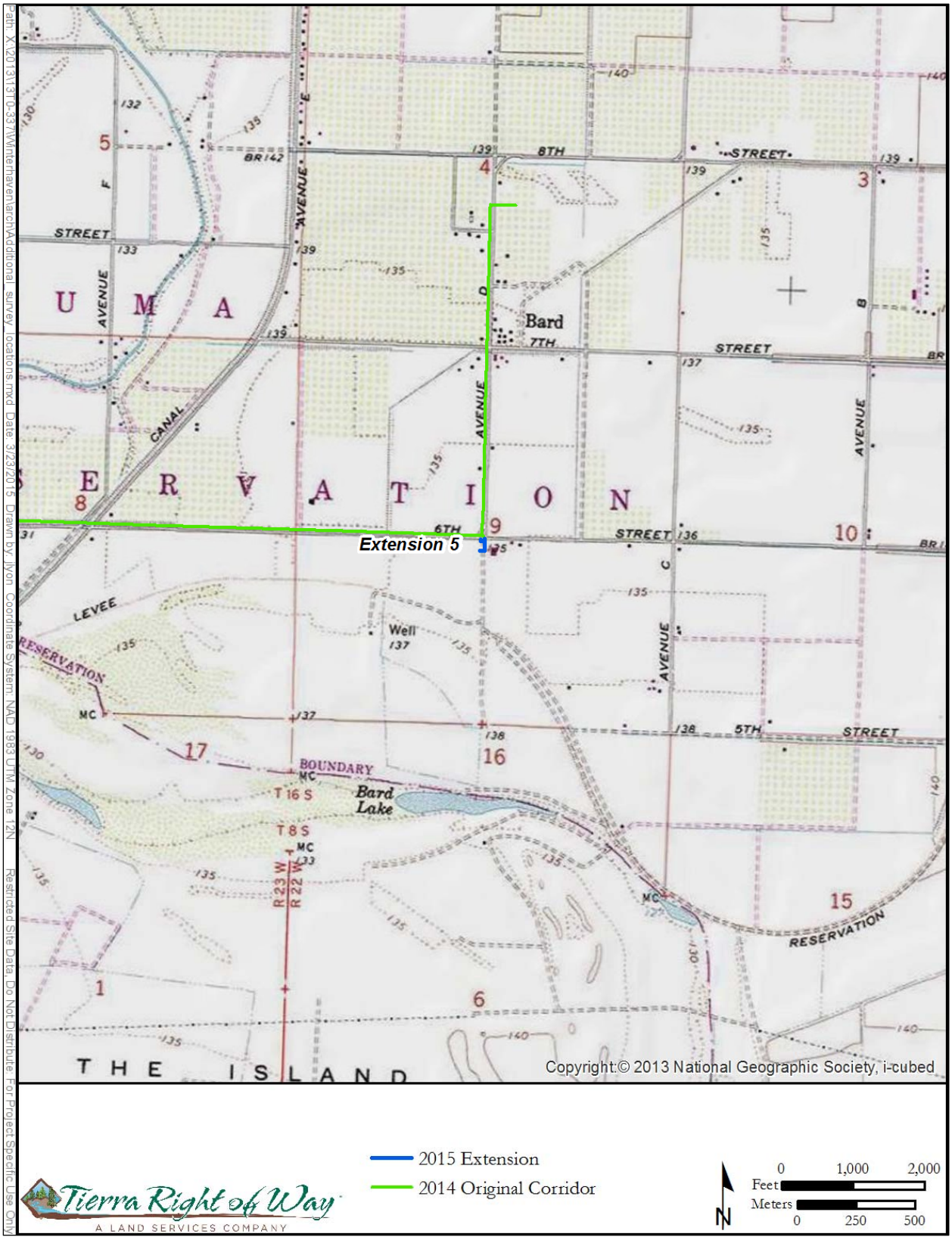


Figure G.4. Location of Extension No. 5.

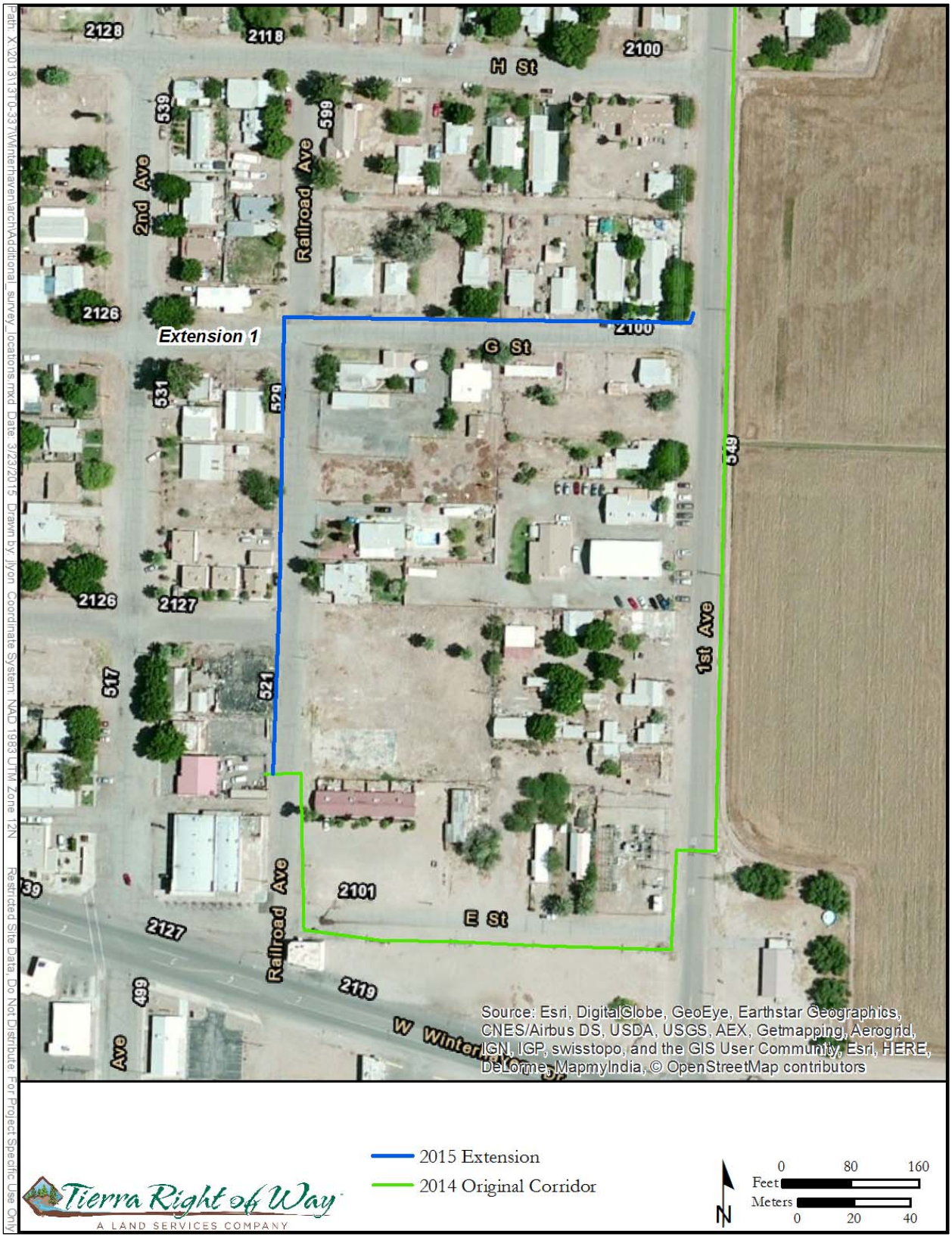


Figure G.5. Aerial view of Extension No. 1.

Photo G.1. Extension No. 1, from TDS building. View is to the north.

Photo G.2. Extension No. 1, from 1st Avenue. View is to the west.

Figure G.6. Aerial view of Extension No. 2.

Photo G.3. Extension No. 2, looking south along Foster Road from Arnold Road.

Photo G.4. Extension No. 3, looking west from Picacho Road.

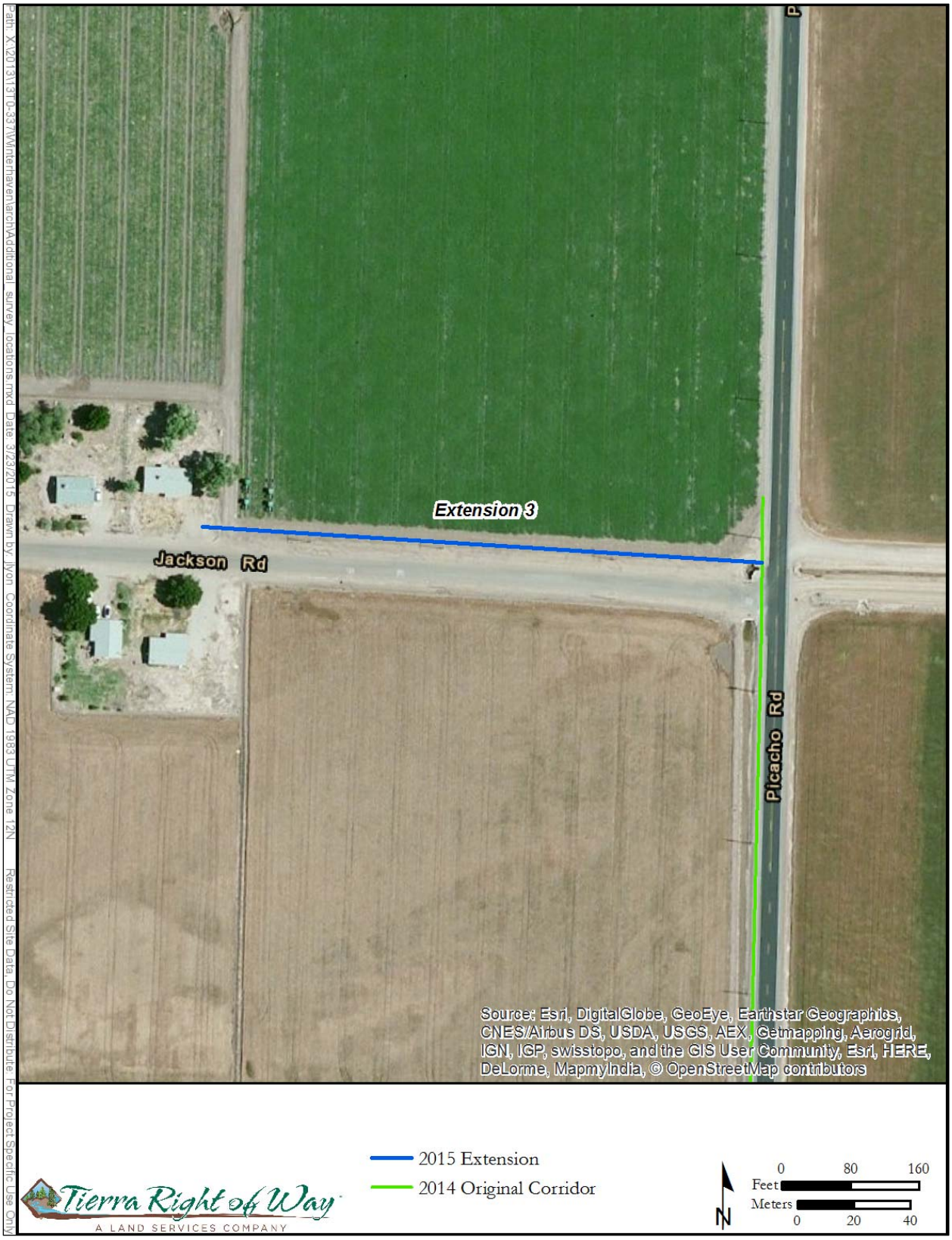


Figure G.7. Aerial view of Extension No. 3.

Figure G.8. Aerial view of Extension No. 4.

Photo G.5. Extension No. 4, along Haughtelin Road. View is to the east.

Photo G.6. Extension No. 4, along Baseline Road. View is to the south.

At the intersection, the extension crosses the Pima Canal (Photo G.7), which parallels the south side of Haughtelin Road and crosses beneath Baseline Road via a culvert. It crosses the canal as it turns along Baseline Road. In addition, along Haughtelin Road, the extension ends near another, apparently unnamed, canal that parallels the road on its north edge (Photo G.8).

Apart from the Pima Canal, no cultural resources were located within Extension No. 4. The Pima Canal is a lateral of the Reservation Main/Cocopah Canal (CA-IMP-6832) (Photos G.9 and G.10). It is expected that the installation of the fiber-optic line will avoid the canal by subsurface directional boring. Additional remarks on the Pima Canal will be made under the description of the relocated fiber-optic line segment along Cocopah Road, below.

Extension No. 5

Extension No. 5 extends south along Levee Road from the intersection at Ross Road (Figure G.9). It runs along the eastern shoulder of Levee Road (Photo G.11), then turns west across the road at a point adjacent to a warehouse. There is also a segment that extends from near the line's northern end, across Levee Road, then turns a few feet northward to match up with an existing utility box (Photos G.12 and G.13). The total length of Extension No. 5 is 315 feet (96 m).

Photo G.7. Footprint of Extension No. 4, where it crosses the Pima Canal. View is to the east.

Photo G.8. Unnamed canal along north side of Haughtelin Road. View is to the east.

Photo G.9. Pima Canal, east side of Baseline Road. View is to the east.

Photo G.10. Pima Canal, west side of Baseline Road. View is to the west.

Photo G.11. Extension No. 5, along Levee Road. View is to the south.

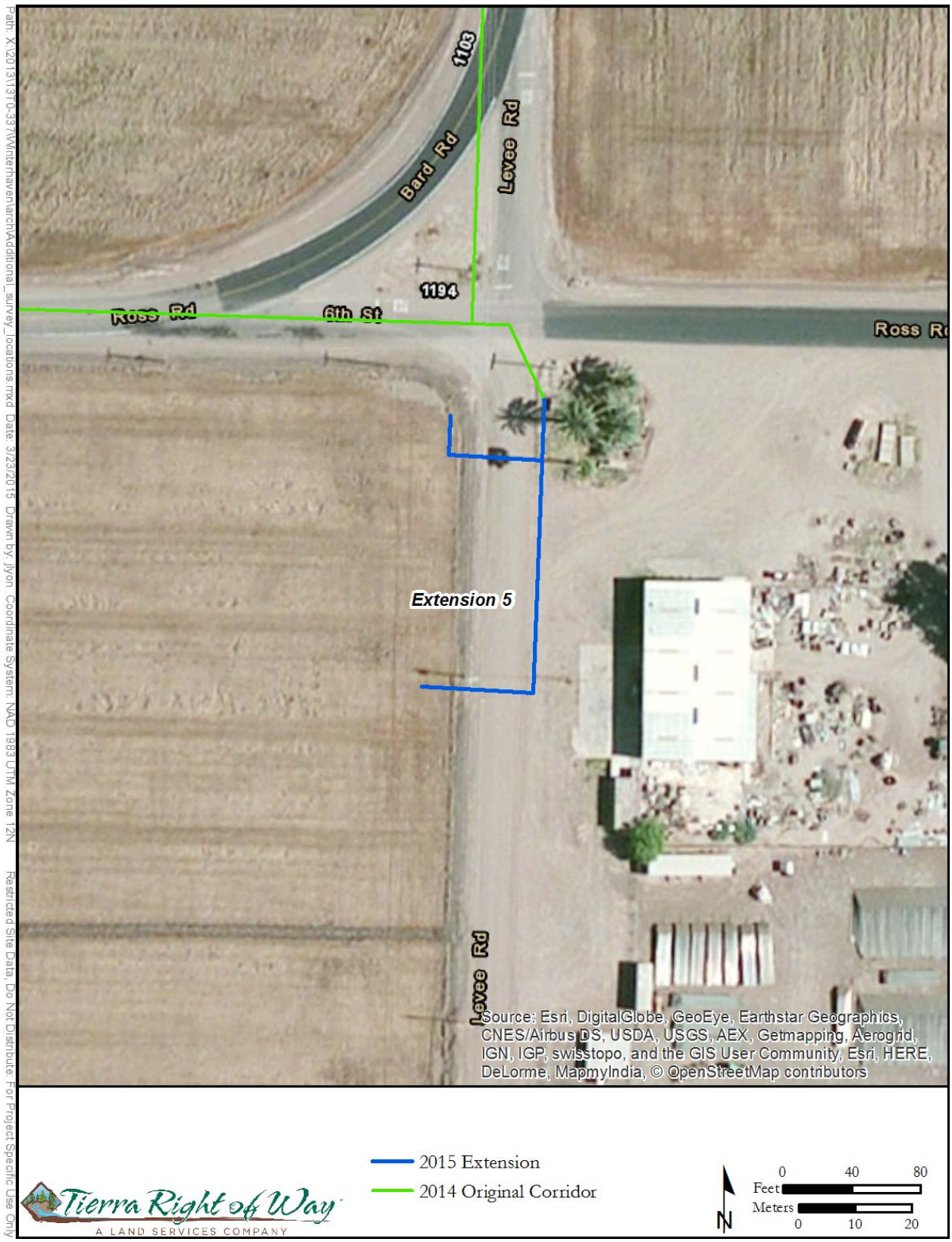


Figure G.9. Aerial view of Extension No. 5.

Photo G.12. Footprint of Extension No. 5, at utility box. View is to the south.

Photo G.13. Extension No. 5, across Levee Road, from utility box. View is to the east.

Segment Relocation

A segment of the proposed fiber-optic line paralleling Cocopah Road between Arnold Road and Haughtelin Road was relocated from the east side of the Reservation Main/Cocopah Canal to the west side of the canal (Figure G.10; Photo G.14). The relocated line runs along the western edge of a berm that parallels the canal and totals 1.82 km (1.13 miles) in length.

The relocated line crosses three linear cultural resources. Two of these are laterals of the Reservation Main/Cocopah Canal. Specifically, the laterals are the Pima Canal (also crossed further to the west by Extension No. 4) and the Pueblo Canal (Photos G.15–G.18). As stated in the Previous Research section of the report, it could not be determined which of the many laterals in the vicinity of the Fort Yuma Indian Reservation were associated with which main canal. However, the current survey demonstrated the Pima and Pueblo Canals are fed (at least today) by the Reservation Main/Cocopah Canal, which has the previous site designation CA-IMP-6832. As discussed in the main body of the report, as laterals of the Reservation Main/Cocopah Canal, the Pima and Pueblo Canals are considered to be components of the overall canal system. As such, they share the site designation of CA-IMP-6832. Both canals cross under the berm via culverts. Both are in active use, and it is expected that the installation of the fiber-optic line will avoid them by subsurface directional boring.

The third linear site that the line crosses is the historic Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158) (Photo G.19; see Figure D.1 in Appendix D). The originally proposed line also crossed this linear utility site, only slightly farther to the east. For additional information on this site, see the Previous Research section in the main body of the report.

No other cultural resources were encountered along the relocated line.

CONCLUSION AND RECOMMENDATIONS

The additional Class III survey for the extensions and partial relocation of the proposed TDS telecommunication fiber-optic line recorded no new cultural resources. The alterations cross three previously recorded properties: the Pilot Knob-Tap Drop 4 161kV Transmission Line (CA-IMP-7158) and the Pima and Pueblo Canals; both canals are components of CA-IMP-6832, the Reservation Main/Cocopah Canal. The transmission line and the canals are currently in use and form aspects of the modern infrastructure of Imperial County. It is not expected that the proposed undertaking will adversely impact these historic properties.

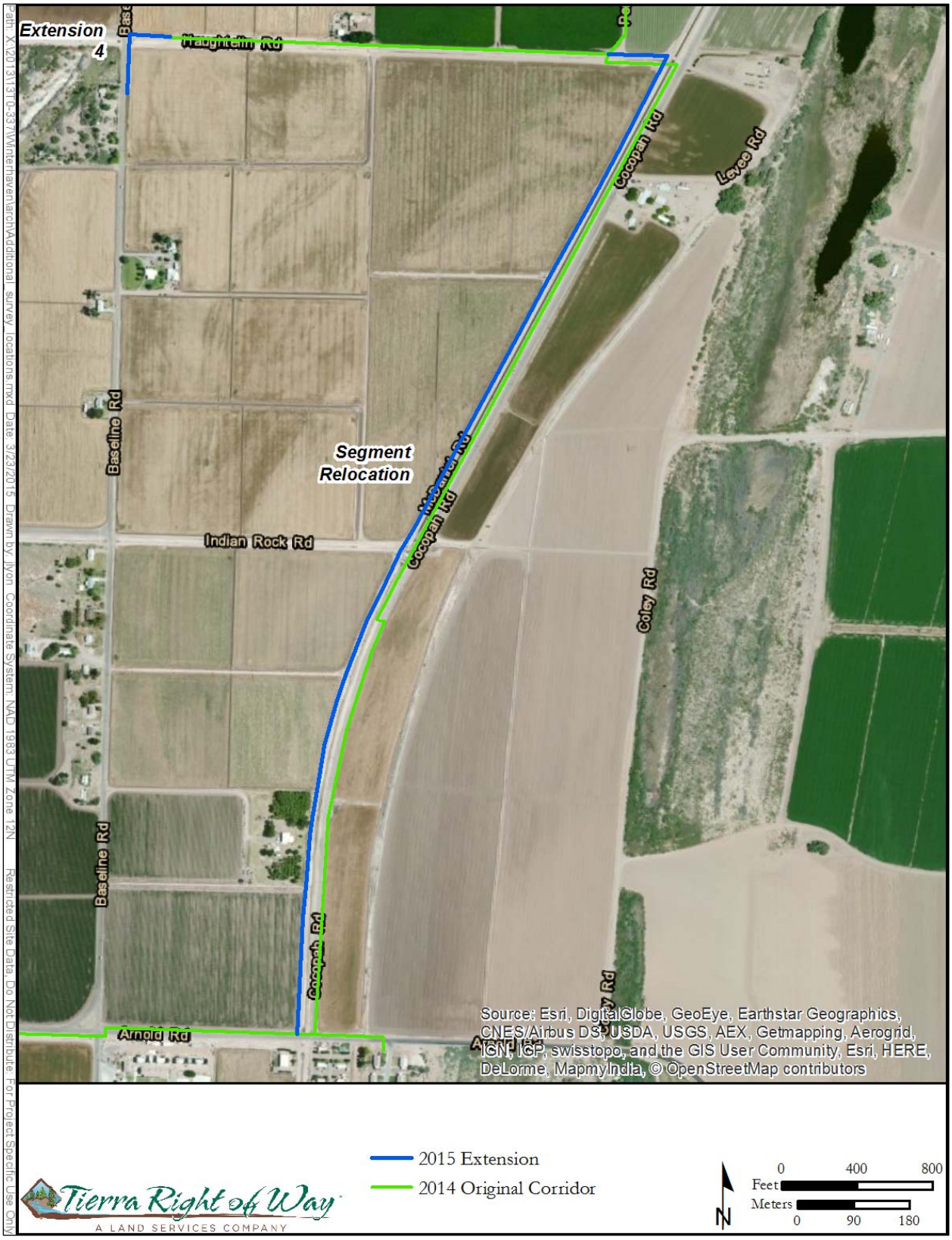


Figure G.10. Aerial view of relocated segment.

Photo G.14. Reservation Main/Cocopah Canal, near Arnold Road. View is to the north.

Photo G.15. Pueblo Canal Headgate on Reservation Main/Cocopah Canal. View is to the east.

Photo G.16. Pueblo Canal. View is to the west.

Photo G.17. Pima Canal Headgate on Reservation Main/Cocopah Canal. View is to the east.

Photo G.18. Pima Canal. View is to the west.

Photo G.19. Pilot Knob-Tap Drop 4 161kV Transmission Line. View is to the east.

OFFICE OF HISTORIC PRESERVATION
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February 19, 2015 Reply in Reference To: BIA_2015_0120_001
(BIA# 2014-316)

Catherine Wilson
Acting Deputy Regional Director
Bureau of Indian Affairs, Western Regional Office
2600 North Central Avenue
Phoenix, Arizona 85004-3008

RE: Fort Yuma Quechan Indian Reservation Fiber-Optic Line Project; Imperial County, California.

Dear Ms. Wilson:

Thank you for seeking my consultation regarding the above noted undertaking. Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA), the Bureau of Indian Affairs (BIA) is seeking my comments regarding the effects that the above named project will have on historic properties.

TDS Telecommunication Corporation (TDS) proposes to install new fiber-optic cable and ten nodes to provide internet service to the communities of Winterhaven, Bard, and the Fort Yuma-Quechan Indian Reservation (Reservation) requiring an easement across Reservation land. This will involve the installation of 8.68 miles of fiber-optic line on Reservation land and 7.75 miles of line within unincorporated Imperial County.

The Area of Potential Effects (APE) consists of a 98-foot wide corridor incorporating all segments of the fiber-optic installation. Trenching to install the fiber optic line will be approximately one to two feet in width to a depth of approximately four feet; therefore the vertical APE for the project will extend to four feet.

In addition to your letter received January 20, 2015, you have submitted *A Class III Cultural Resources Survey for a Proposed Buried Telecommunications Fiber-Optic Line near Winterhaven, in Imperial County, California* (Howell, December 22, 2014) as evidence of your efforts to identify and evaluate historic properties in the project APE.

Archival research included a record search at the South Coastal Information Center in May and June 2014, and the Arizona State Museum's AZSITE online database on April 15, 2014. Five previously recorded sites were determined to lie within the APE for the project:

	Resource Designation	Resource Description	NRHP Eligibility	Project Effect
1	CA-IMP-3424	Southern Pacific Railroad	Eligible; Criteria A	No Adverse Effect
2	CA-IMP-6824	Reservation Main Drain Canal	Eligible; Criteria A	No Adverse Effect
3	CA-IMP-6830	Yuma Main Canal	Eligible; Criteria A	No Adverse Effect
4	CA-IMP-6832	Cocopah Canal	Eligible; Criteria A	No Adverse Effect
5	CA-IMP-7158	Pilot Knob Tap Drop 4 16 kV Line	Eligible; Criteria A	No Adverse Effect

Native American consultation included contact with the Tribal Historic Preservation Officer, Arlene Kingery, on May 16, 2014 regarding knowledge of sites of religious or cultural significance to the tribe in the project area. No such properties were identified through consultation efforts.

A pedestrian surface survey was conducted of the APE utilizing transects spaced fifteen meters apart on July 15 and 16, 2014. One built resource was identified and recorded:

	Resource Designation	Resource Description	NRHP Eligibility	Project Effect
6	P-13-014813	Walapai Canal	Eligible;	No Adverse Effect

Ten isolated finds were also observed within the APE. Six of these isolates are lithic fragments that could only be tentatively identified as flaked stone. All were found in disturbed contexts. Three isolates were possible historic glass; one of which was associated with a fragment of white earthenware. One isolated occurrence was a roadside memorial shrine recorded with the intent to document its location for avoidance.

The BIA has recommended the six resources listed in the tables above as eligible to the NRHP. The ten isolated finds do not qualify as historic properties under Section 106 of the NHPA. Pursuant to 36 CFR §800.5(b) the BIA has determined a *Finding of No Adverse Effect* to historical properties by the proposed project.

I agree the ten isolated finds described do not meet the qualifications as historic properties. Because formal evaluations were not provided for the above listed built environment resources, I cannot make a determination of eligibility to the NRHP. I suggest the resources be assumed eligible to the NRHP for purposes of this project only. Because the project will have no adverse effect to these resources I then concur with the *Finding of No Adverse Effect* for the project. After clarification of information obtained through phone contact, I also concur identification efforts are sufficient and I also have no objections to the delineation of the APE, as depicted in the supporting documentation. For future reference I wish to clarify that canals are considered built resources and not archaeological resources.

Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the BIA may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Associate State Archaeologist, Kim Tanksley at (916) 445-7035 or by email at kim.tanksley@parks.ca.gov. Any questions concerning the built environment should be directed to State Historian, Kathleen Forrest at (916)445-7022 or by email at kathleen.forest@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, PhD
State Historic Preservation Officer