APPLICATION
L-00000D-14-0292-00169

PART 2 OF 2
BARCODE # 0000154032

To review Part 1 please see:

BARCODE #0000154031

ATTACHMENT E-1 – CULTURAL RESOURCE RECORDS REVIEW AND ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT THE OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

CULTURAL RESOURCE RECORDS REVIEW AND ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT THE OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

prepared for

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URS Cultural Resource Report 2013-27(AZ)

Restrict Distribution

To avoid vandalism, restrict information in this report about the location of archaeological sites, as provided for by Section 304 of the National Historic Preservation Act, Section 9(a) of the Archaeological Resources Protection Act, and Section 39-125 of the Arizona Revised Statutes.

Disclaimer

In preparing this report, URS Corporation used background information that was compiled by prior studies in the project vicinity. URS Corporation relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

September 2013

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ACRONYMS AND ABBREVIATIONS

ACC	Arizona Corporation Commission
APS	Arizona Public Service
ADOT	Arizona Department of Transportation
Arizona Register	Arizona Register of Historic Places
ASM	Arizona State Museum
ASU	Arizona State University
CEC	Certificate of Environmental Compatibility
cm	centimeter
km	kilometer
m	meter
National Register	National Register of Historic Places
SHPO	State Historic Preservation Office
TCHPO	Tempe City Historic Preservation Office
Tempe Register	Tempe Historic Property Register

ABSTRACT

Agencies: none at this phase of project planning

Report Title and Date: *Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona.* September 2013

Permits: none required

Project Numbers: URS Job 23446491

Project Description: The Arizona Public Service Company developed the Ocotillo Power Plant in the late 1950s. APS currently operates two 110-megawatt gas-fired steam units and two 55-megawatt combustion turbines at the plant, and is considering upgrades to the facility. To accommodate the engineering design of potential future modifications, APS undertook geotechnical investigations that involved excavation of 21 borings. To proactively comply with potential future regulatory requirements and consider potential effects on archaeological and historical resources from the earliest stages of project planning, APS retained URS Corporation to archaeologically monitor the geotechnical investigations. This report documents a records review that compiled information about prior cultural resource studies and recorded cultural resources within and near the project area and the methods and results of the archaeological monitoring.

Location: The APS Ocotillo power plant is on the south side of the Salt River in the Phoenix Basin. The power plant is on a parcel of land owned by APS at 1500 East University Drive in north Tempe, within the SE1/4 of Section 14, Township 1 North, Range 4 East, Gila and Salt River Meridian. The area is mapped on the Tempe, Arizona, U.S. Geological Survey 7.5-minute topographic quadrangle.

Scope of Project and Jurisdiction: The power plant parcel covers about 126 acres (51 hectares), but facilities other than the Ocotillo Power Plant are located on the parcel, including electrical substations and the Tempe/APS Joint Fire Training Center. The area of potential effects for the geotechnical investigations consisted of those areas where ground disturbance could occur. This includes an area about 100 feet (30 meters) square centered on each of the 21 borings, which accumulates to about 5 acres (2.0 hectares) within the power plant parcel. Setting up and operating the drill rig truck and parking other vehicles actually resulted in very shallow disturbance of previously disturbed ground and the deeper disturbance from the borings accumulated to less than 10 square feet (1 square meter).

Personnel and Dates of Fieldwork: Archaeologists Chad Kirvan and Ronald Savage conducted 4 person-days of archaeological monitoring between 26 June and 1 July 2013. Dr. A.E. (Gene) Rogge served as principal investigator.

National Register-Eligible Properties: none

National Register-Ineligible Properties: A few hundred Hohokam artifacts (mostly plain ware, buff ware, and red ware Hohokam potsherds, a few pieces of flaked stone, 1 piece of ground stone, and perhaps a few pieces of faunal bone that might be natural rather than cultural deposits) were

found in such highly disturbed contexts that they have virtually no potential to yield important information. They were not recorded as an archaeological site at this time.

Conclusion and Recommendations:

A records review documented that the prehistoric Hohokam farmed in the vicinity of the power plant parcel and occupied a large village site known as La Plaza for several centuries (from the Pioneer to the Classic periods, circa A.D. 500 to 1400) southwest of the power plant parcel. The village site is on the Mesa terrace, which is a higher landform than the Lehi terrace on which the power plant parcel is located. Prior archaeological investigations have found only evidence of farming and seasonal field houses on the lower Lehi terrace.

The archaeological monitoring found a few hundred Hohokam artifacts on the surface of the ground in highly disturbed contexts, suggesting that construction activities on the power plant parcel probably disturbed archaeological deposits within a Hohokam field area—perhaps a field house site that might have had evidence of temporary shelters, canals, and various types of pits. Human burials usually are associated with village sites, but three burials were found at a field house site excavated south of the La Plaza site, indicating that burials also can be associated with field house sites. The archaeological monitoring identified no evidence that any burials had been disturbed by construction activities within the power plant parcel.

The sediments documented in the geotechnical borings are varied, as expected in a floodplain adjacent to a dynamic braided and migrating river channel. The deposits are primarily sands that reflect a relatively high energy depositional environment that is not conducive to the preservation of archaeological deposits. However, pockets of finer sediment reflecting gentler, overbank flood deposits that are conducive to preserving archaeological deposits might remain intact, as identified by prior archaeological excavations at the margins of the La Plaza site about 0.5 mile (0.8 kilometer) west of the power plant parcel.

Ideally, archaeological testing could be conducted to further explore whether intact archaeological deposits might remain buried in the power plant parcel, but the extent of infrastructure within the parcel greatly limits the potential to undertake archaeological testing safely. We recommend that APS consider whether some archaeological testing might be conducted to expose vertical profiles of sediments, which could be analyzed to better understand the nature and age of the deposits and better gauge whether significant archaeological deposits might remain intact within the parcel.

Documentation of the structure and texture of exposed deposits would provide more information about the geomorphology of the sediments, particularly with regard to whether the energy of the depositional environment would have been conducive to preservation of archaeological deposits. If charred materials are exposed, they could be collected and radiocarbon dated to better understand the chronology of the deposits. If appropriate contexts are identified, sediment samples could be collected and analyzed to extract pollen and biosilicates that could provide information about the local environment and how it changed over time and whether the Hohokam used the area for farming and what crops they might have grown.

Smoothing vertical faces on the side walls of the spill containment pits around the three large fuel storage tanks in the western part of the power plant parcel might be an

alternative to excavating new test trenches. Archaeological monitoring of the removal of obsolete facilities or construction of new facilities also might provide additional opportunities to determine whether significant archaeological deposits are buried within the power plant parcel.

In summary, field observations made during the archaeological monitoring of the geotechnical borings documented that prehistoric Hohokam artifacts were present in the power plant parcel but they were in contexts disturbed by construction activities. It is recommended that APS consider opportunities for additional archaeological testing or monitoring to further investigate whether any buried archaeological deposits might remain intact. If intact archaeological deposits were found, it is recommended that they be evaluated and treated in accordance with any applicable local government, state, or federal regulations.

CULTURAL RESOURCE RECORDS REVIEW AND ARCHAEOLOGICAL MONITORING OF GEOTECHNICAL INVESTIGATIONS AT THE OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

INTRODUCTION

The Arizona Public Service Company (APS) developed the Ocotillo Power Plant in the late 1950s. APS currently operates two 110-megawatt gas-fired steam units and two 55-megawatt combustion turbines at the plant, and is considering upgrades to the facility. To accommodate the engineering design of potential future modifications, APS undertook geotechnical investigations that involved excavation of 21 borings.

The borings were 8 inches (20 centimeters [cm]) in diameter and ranged from 12 to 22 feet (3.7 to 6.7 meters [m]) deep, except for Boring B-21, which was stopped at a depth of 4 feet (1.2 m) when an apparent abandoned concrete storm drain was encountered. The other borings were halted by auger refusal to penetrate deposits of sand, gravel, cobbles, and possible boulders. The field operations involved a truck-mounted hollow-stem auger, a smaller flatbed truck with a water tank, and a pickup truck. The auger truck was about 8.5 feet (2.6 m) wide and 34 feet (10.4 m) long and equipped with a mast about 33 feet (10 m) tall (**Photograph 1**).

Photograph 1. Truck Mounted Hollow-Stem Auger Set Up at Boring B-07 (view north)

No mud pits were dug and no spoil piles were generated. At selected intervals, soil samples were collected using one of the following techniques:

- collection of bulk samples of sediments from the material augured from the borings (**Photograph 2**),
- driving a split-barrel sampler (standard penetration test spoon) through the hollow auger to collect samples 1.4 inches (3.5 cm) in diameter and 18 inches (46 cm) long (**Photographs 3 and 4**), or
- driving a modified split-barrel collection tube with brass rings to collect relatively undisturbed samples 2.4 inches (6.1 cm) in diameter and 18 inches (46 cm) long.

Bentonite was used to backfill each boring. Field activities were confined to the immediate area around each boring. Except for the 8-inch-diameter borings, ground disturbance was very shallow, resulting only from parking of the vehicles used in the operations. A two-person crew from Enviro-Drill excavated each boring in less than an hour and a geologist from Ninyo & Moore supervised the collection of samples and prepared boring logs to document the sediments found in each boring. APS provided the geotechnical investigation report (Ninyo & Moore 2013) so the results could be considered in preparing this report.

Photograph 2. Soil Augered from the Upper 4 Feet of Boring B-21

Photograph 3. Hollow-Stem Auger used to Collect Soil Samples, Boring B-9

Photograph 4. Split-Barrel Sample from Boring B-9

Cultural Resource Regulatory Requirements

The Ocotillo Power Plant parcel has been highly disturbed by construction and operation of the facility and decades of farming prior to that. APS nevertheless recognized that there is some potential for archaeological resources to be deeply buried within the parcel. No federal, state, or local government permits were required to conduct the geotechnical investigations and there was no regulatory requirement to consider potential impacts on cultural resources.

Future modifications of the power plant might require a Certificate of Environmental Compatibility (CEC) from the Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission (ACC). The ACC *Rules of Practice and Procedure R14-3-219* stipulate that Exhibit E of CEC applications describe historic sites and structures or archaeological sites in the vicinity of the proposed facilities and the effects that the facilities could have on those resources.

Exhibit E of CEC applications supports ACC compliance with the State Historic Preservation Act (Arizona Revised Statutes 41-861 through 41-864), which requires State agencies to consider impacts of their programs on historic properties listed in or eligible for the Arizona Register of Historic Places (Arizona Register). To be eligible for the Arizona Register, properties must be 50 years old (unless they have special significance) and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture (Arizona Administrative Code, Title 12, Chapter 8, Article 3, R12-8-302). They also must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance, and meet at least one of four criteria:

- Criterion A: be associated with significant historical events or trends
- Criterion B: be associated with historically significant people
- Criterion C: have distinctive characteristics of a style or type, or have artistic value, or represent a significant entity whose components may lack individual distinction
- Criterion D: have yielded or have potential to yield important information

Pursuant to the State Historic Preservation Act, the ACC provides the State Historic Preservation Office (SHPO) 30 working days to comment on proposed projects that affect properties listed in or eligible for the Arizona Register.

The City of Tempe is a Certified Local Government under the auspices of the Arizona Historic Preservation Plan. The city enacted a local historic preservation ordinance, designated a City Historic Preservation Officer, and formed a Historic Preservation Commission. The local ordinance establishes procedures for designating historic overlay zoning as a measure to protect historic properties. The SHPO expects the Tempe City Historic Preservation Office to be consulted about projects that could affect historic properties within the City of Tempe.

To proactively comply with potential future regulatory requirements and consider potential effects on archaeological and historical resources from the earliest stages of project planning, APS retained URS Corporation to archaeologically monitor the geotechnical investigations. This report documents a records review that compiled information about prior cultural resource studies and recorded cultural resources within and near the project area and the methods and results of the archaeological monitoring.

Project Location and Area of Potential Effects

The APS Ocotillo power plant is on the south side of the Salt River in the Phoenix Basin (**Figure 1**). The power plant is on a parcel of land owned by APS at 1500 East University Drive in north Tempe. The parcel covers about 126 acres (51 hectares) in the SE1/4 of Section 14, Township 1 North, Range 4 East, Gila and Salt River Meridian. The area is mapped on the Tempe, Arizona, U.S. Geological Survey 7.5-minute

Base map sources: Shaded Relief. Arizona Land Resource Information System, Arizona State Land Department, Phoenix, Arizona. 2010 Electronic Data Purchase. Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community. Use athorized by Esri license.

0 5 10 Miles

0 5 10 15 Kilometers

N

■ Project Location

General Project Location
Figure 1

topographic quadrangle (see appended **Figure A-1**). Other facilities other than the Ocotillo Power Plant are located on the parcel, including electrical substations and the Tempe/APS Joint Fire Training Center.

The Salt River is dammed north of the power plant to create Tempe Town Lake, about 1,500 feet (460 m) north of the project area. The Rio Salado Parkway passes by the northern end of the power plant parcel and the Arizona State University (ASU) Karsten Golf Course is between the parcel and Tempe Town Lake, forming much of the northern and western boundary of the parcel. University Drive is along the southern edge of the parcel and McClintock Drive is along the eastern boundary (**Figure 2**). Tempe Butte (also known as Hayden Butte or A Mountain, as well as *Oitbad* [Deadfield Mountain] to the Akimel O'odham), rises about 300 feet (90 m) above the surrounding terrain about 1 mile (1.6 kilometer [km]) west of the project area.

The area of potential effects for the geotechnical investigations consisted of those areas where ground disturbance could occur. This includes an area about 100 feet (30 m) square centered on each of the 21 borings, which accumulates to about 5 acres (2.0 hectares) within the power plant parcel. Setting up and operating the drill rig truck and parking other vehicles actually resulted in very shallow disturbance of previously disturbed ground and the deeper disturbance from the borings accumulated to less than 10 square feet (1 square m).

Personnel and Permits

Archaeologists Chad Kirvan and Ronald Savage conducted 4 person-days of archaeological monitoring between 26 June and 1 July 2013. Dr. A.E. (Gene) Rogge served as principal investigator. No permits were required for the monitoring.

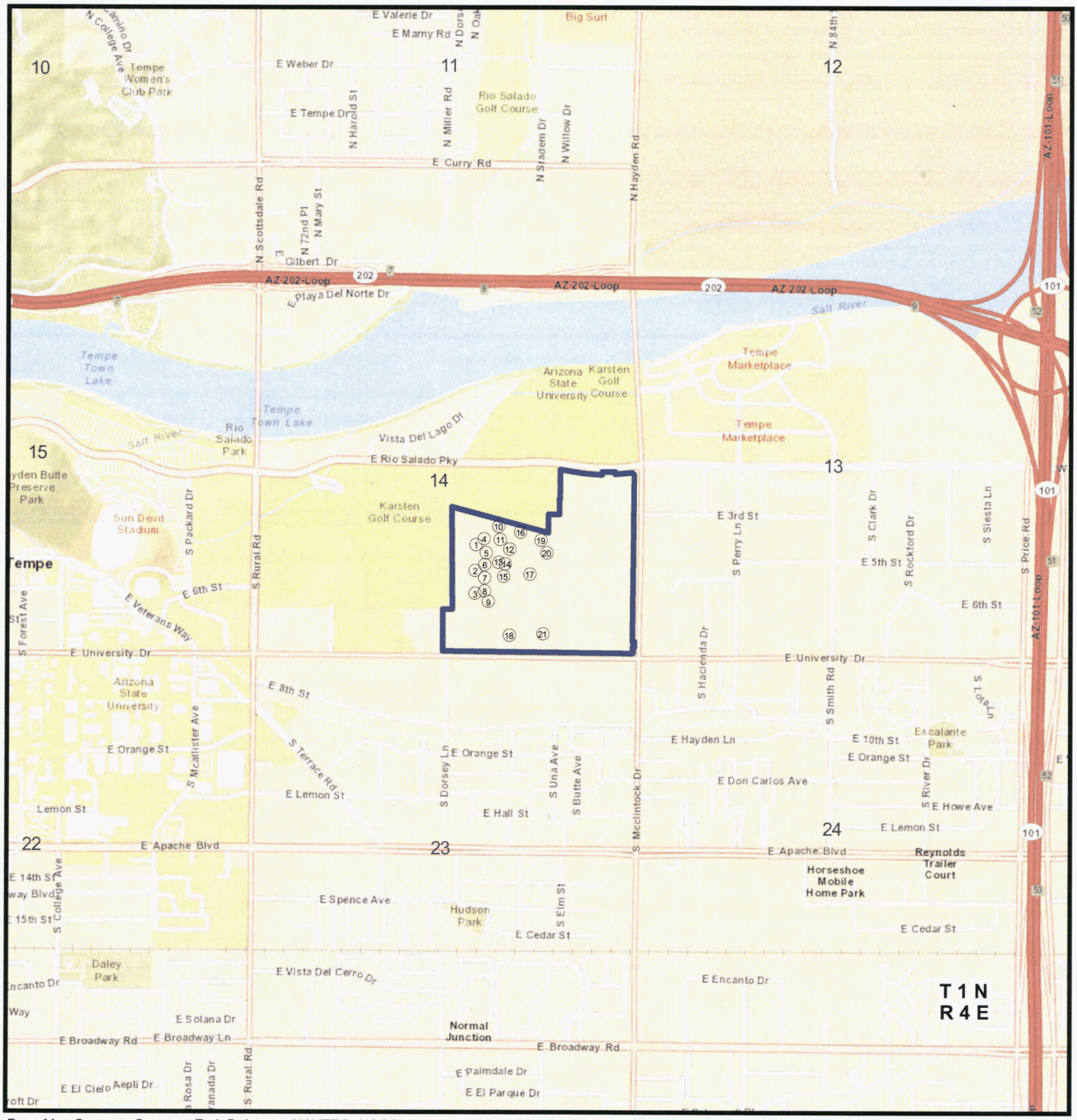
ENVIRONMENTAL SETTING

The Phoenix Basin is within the Basin and Range physiographic province that is characteristic of much of the interior western United States (Thornbury 1965). The topography of the valley floor slopes gently to the southwest. The power plant parcel is on the Lehi terrace at an elevation of approximately 1,170 feet (357 m) above sea level. The Lehi terrace is the lowest and youngest of four terraces identified along the Salt River, being only about 5 feet (1.5 m) above the river bed in the Tempe area and of late Pleistocene age. The higher and older terraces include the Blue Point, Mesa, and Sawik (Wellendorf and others 1986).

The climate is hot and arid. High summer temperatures and mild winters with considerable variation in daily temperatures are characteristic of the area. Average annual precipitation is less than 8 inches (20 cm), and typically occurs as brief, violent summer thunderstorms and lighter winter showers with durations of up to several days (Sellers and Hill 1974).

Natural vegetation was been removed from the project parcel first by historic agricultural development and subsequently by development of the Ocotillo Power Plant. A reconstruction of natural vegetation based on 1860s General Land Office survey records indicates the project parcel was in a saltbush community just south of a cottonwood-willow gallery forest along the Salt River (Jacobs and Rice 2002). The riparian zone along the Salt River would have been a major source of natural resources for aboriginal populations, and was a major source of irrigation water for the prehistoric Hohokam and historic farming economies.

Small mammals, including rabbits, ground squirrels, rats, and mice, were probably the most numerous faunal species living in the project vicinity during the prehistoric era (Lowe 1964). Reptiles such as lizards and snakes also would have been common, and the Salt River and low-lying marshy areas undoubtedly supported populations of fish, turtles, and amphibians, and probably attracted large numbers of birds. Mule deer and coyotes also may have been relatively abundant in the general project vicinity.



Base Map Source: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri, Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012. Use authorized with Esri license.

Legend

- Geotechnical Boring
- Project Parcel

N

0 1,000 2,000 3,000 Feet

0 250 500 750 1,000 Meters

Ocotillo Power Plant Parcel
Figure 2

CULTURAL HISTORY

The cultural history of south-central Arizona can be divided into numerous periods that reflect changing adaptations and lifeways over approximately 14,000 years. Those include the Paleoindian (12,000 to 8500 B.C.), Archaic (8500 to 1500 B.C.), Late Archaic/Early Agricultural (1500 B.C. to A.D. 50), Early Ceramic (A.D. 50 to 450), Hohokam (A.D. 450 to 1450), protohistoric (A.D. 1450 to 1539), Spanish (1539 to 1821), Mexican (1821 to 1848/1854), and American (post-1848/1854) periods. The following sections summarize the regional cultural history. Cordell and McBrinn (2012) and Reid and Whittlesey (1997) provide more details about the prehistoric occupation, and Sheridan (2012) and Spicer (1962) discuss the historic period.

Paleoindian and Archaic Periods

Nomadic hunters known as the Paleoindians were the first well-documented occupants of the Southwest, although evidence of earlier occupation continues to be found elsewhere in the New World. Their prey included now-extinct large game species, such as mammoth and giant bison. Evidence of early Paleoindian hunter groups has been found at several sites in southeastern Arizona (Huckell 1982, 1984), but the only evidence of Paleoindian occupation in the Phoenix Basin is limited to isolated projectile points, perhaps because Paleoindian sites have been buried by deep layers of alluvial deposits, or they have been eroded away. Alternatively, the area may have been only minimally occupied at that time.

The subsequent Archaic period reflects a continuing hunting-and-gathering lifeway and a subsistence-settlement strategy involving annual rounds of seasonal camp movements through expansive territories. Archaic populations adapted to the changing climate and the extinction of big-game animals by hunting smaller game, such as deer and rabbits, and intensively exploiting a diversity of wild plants, particularly hard seeds. Huckell (1984) divided the Archaic era into three broad periods: Early (circa 8500 to 4800-4000 B.C.), Middle (circa 4800–4000 to 1500 B.C.), and Late (circa 1500 B.C. to A.D. 300).

The rare Early Archaic sites that have been identified are commonly characterized by concentrations of burned rock used in hearths and cooking pits and by diagnostic artifacts such as ground stone milling tools—particularly one-hand manos and slab metates—and stemmed projectile points (Huckell 1996; Mabry and Faught 1998). Only one site in the Phoenix Basin, AZ T:11:94(ASM), has yielded radiocarbon dated features from the Early Archaic period. Calibrated calendar dates of about 4900 B.C. and 4500 B.C. were obtained from two pit structures at that site and a hearth was dated at about 3900 B.C. The features lacked diagnostic artifacts, and a mesquite post and a maize cupule recovered from the fill of the oldest pit structure yielded anomalous younger dates, but geomorphological analysis identified the context of the features as rare middle Holocene deposits, supporting the Early Archaic dates (Graves and others 2009).

The Middle Archaic period is perhaps the least understood period in Arizona prehistory (Gregory 1999; Huckell 1996; Mabry, ed. 1998). During the Middle Archaic period, the summers apparently were hotter and the winters cooler, with perhaps lower effective moisture (Mabry, ed. 1998; Thompson and others 1993). The landscape was subjected to episodes of alluvial cutting and filling (Waters 1986) and lake desiccation (Waters 1989), which may have destroyed or deeply buried many Middle Archaic sites.

In southern Arizona, the most substantial evidence of a Middle Archaic occupation is documented along the Santa Cruz River in the Tucson Basin and surrounding mountains (Huckell 1984; Stacy and Hayden 1975). Features discovered at Middle Archaic sites include use surfaces, hearths, thermally altered rock, and occasional middens (Bayham and others 1986; Fish 1967; Gregory 1999; Huckell and Vint 2000). The most substantial evidence of a Middle Archaic occupation in the Phoenix Basin was found at the Last Ditch site [AZ U:5:33(ASM)], where investigations have discovered more than 200 features dating to the Middle Archaic period, including hearths, what may be remnants of two temporary shelters, and use surfaces (Phillips and others 2001; Rogge 2011). Middle Archaic structures have been found at site

AZ T:7:419(ASM) on the lower bajada of the White Tanks Mountains in the western Phoenix Basin (Statistical Research 2012), and other archaeological features have been found buried in alluvial fans along the margins of the western Phoenix Basin (CH2M Hill and French 1992).

Late Archaic/Early Agricultural Period

The subsequent Late Archaic period is now referred to as the Early Agricultural period in some parts of southern and central Arizona because research over the last two decades has clearly demonstrated that domesticated crops were being grown in some areas at that time (Diehl 2005; Gregory and others 2007; Huckell 1995, 1996; Matson 1991; Roth 1992, 1993; Thiel and Mabry 2006; Wills 1988). The Early Agricultural period begins with the appearance of maize in the archaeological record, now dated to about 2100 B.C. in the Tucson Basin, and ends with the beginning of a ceramic-container technology at about A.D. 50 (Gregory and others 2007; Thiel and Diehl 2006). Local populations grew maize and squash and probably beans, all of which had been domesticated in Mesoamerica to the south. They also may have grown cotton and tobacco that may have been domesticated or local indigenous varieties. A variety of other indigenous seed-bearing plants such as amaranth and goosefoot also may have been encouraged, but local groups continued to rely heavily on hunting game and gathering indigenous plants for food. This "farmaging" subsistence strategy was pursued for more than 2,500 years before the region witnessed the substantial transformation of a Neolithic Revolution to a fully sedentary, village-farming, pottery-using way of life (Altschul 1995; Deaver and Ciolek-Torrello 1995; Diehl 2005; Gregory and Mabry 1998:11; Huckell 1995, 1996; Mabry 1998; Mabry and others 1997) and a Neolithic demographic transition to rapid population growth that is typical of the adoption of a village-based farming around the world (Bocquet-Appel 2011; Childe 1936).

During the Early Agricultural period, populations began settling in semipermanent or permanent villages of circular pit houses along river floodplains (Fish and others 1986; Huckell 1990; Mabry and others 1997; Roth 1992; Wills and Huckell 1994). Irrigation canals associated with these early villages in the Tucson Basin have been dated to about 1500 B.C. at the Clearwater site (Thiel and Mabry 2006) and about 1200 to 1100 B.C. at the Las Capas site, making them the oldest canals in the Southwest (Mabry 1999). In addition to locations along river margins, some Late Archaic sites have been found at higher elevations at the bases of mountains. These sites are generally situated near natural travel corridors, and they are frequently close to springs or seeps (Hackbarth 1999).

Artifacts diagnostic of the Late Archaic/Early Agricultural period include corner-notched dart points and dart points with contracting stems, triangular knives, flake scrapers, and ground stone milling tools. The region's oldest ceramics, including small bowls and fired-clay figurines, also were produced in this period (Gregory 1999; Heidke 1997; Heidke and Ferg 1998; Mabry and others 1997; Thiel and Mabry 2006).

Hackbarth (1998) documented a Late Archaic/Early Agricultural component at the Last Ditch site dated to the last four centuries B.C. Other Late Archaic/Early Agricultural sites have been recorded in the McDowell Mountains (Ellis 1997a, 1997b; Hohmann 1999; Marshall and Bostwick 1999; Opfenring 1965; Owens 1995a, Wright 1999). The New River-Stricklin site [AZ T:4:1(ASU)], adjacent to the New River, dates to about 800 to 400 B.C. and appears to be a Late Archaic base camp (Kenny 1987; Rodgers 1989:7). Late Archaic features also were discovered recently at site AZ T:7:419(ASM) (Statistical Research 2012).

Early Ceramic Period

During the subsequent Early Ceramic period (A.D. 50 to 500), use of containers made of plain ware pottery became widespread, with storage jars and worked potsherds dominating ceramic assemblages (Lindeman and Wallace 2004). The earliest evidence of ceramic-producing populations in the Phoenix Basin is associated with the Red Mountain phase (Abbott 2000; Cable 1991; Cable and Doyel 1985a, 1985b, 1987; Mabry 2000). Morris (1969) first identified this phase four decades ago, but only recently has it been

documented more thoroughly. From the few sites that have been investigated, the Red Mountain phase appears to be similar to the Early Ceramic sites that have been found more frequently in the Tucson Basin. Cable (1991) and Cable and Doyel (1987) suggested that the Red Mountain phase represents a Phoenix Basin variant of a local Sonoran Desert ceramic plain ware tradition. The limited information available suggests that these populations resided in large, square pit houses and were dependent on maize agriculture (Cable 1991). Although the Red Mountain phase often is considered the beginning of the Hohokam Pioneer period, it probably is more appropriately classified as representative of a pre-Hohokam plain ware tradition (Lindeman and Wallace 2004; Wallace and others 1995).

Hohokam Era

At about A.D. 500, red ware pottery began to be made and villages of numerous pit houses were built around central plazas in a pattern that indicates multiple kin groups made a commitment to live together. Wallace (2004) argues that this marks the beginning of the Hohokam culture, which seems to represent a delayed Neolithic Revolution and Neolithic demographic transition.

The remains of the village-dwelling Hohokam farmers overwhelmingly dominate the archaeological record of the Phoenix Basin, and they have been the subject of intensive study in central and southern Arizona (for example, Doyel 1981; Gladwin and others 1938; Haury 1976; Wilcox and Sternberg 1983). The Hohokam culture is noted for its extensive irrigation systems along the Salt River and Gila River (Gumerman 1991). The Hohokam occupation is reasonably well dated between about A.D. 450 and 1450 (Dean 1991; Eighmy and McGuire 1988; Haury 1976; Lindeman and Wallace 2004; Schiffer 1982; Wallace 2001, 2004).

There are four (some archaeologists argue five) major periods in the Hohokam chronology, which in turn are divided into a number of phases based on differences in decorated ceramics, artifact and architecture styles, and mortuary practices. In the Phoenix Basin, the Hohokam Pioneer period (circa A.D. 450 to 750) is divided into four phases: Vahki, Estrella, Sweetwater, and Snaketown (Dean 1991).

Phases defined for the Colonial period (circa A.D. 750 to 900 or 950) are Gila Butte and Santa Cruz. During the Colonial period, domestic architectural units began to be arranged in courtyard groups (Howard 1985; Wilcox and others 1981). Community architecture in the form of ballcourts also has been discovered at some of the larger villages occupied during the Colonial period in the Phoenix Basin.

The Sacaton phase is associated with the Sedentary period (circa A.D. 900 or 950 to 1125 or 1150), although some archaeologists argue for an additional Santan phase transitional to the subsequent Classic period (Doyel 2000). The Sedentary period witnessed further expansion of settlements and canal irrigation systems as well as the development of various other agricultural strategies. The construction of ballcourts continued, and platform mounds, another form of community architecture used for ceremonies or elite residences, began to be built at the larger villages near the end of the Sedentary period. Hierarchical relationships among Sedentary period sites are recognized in the Phoenix Basin as well as in the Tucson Basin (Doelle and others 1987; Gregory 1991; Howard 1987; Wilcox and Sternberg 1983).

The Classic period (circa A.D. 1125 or 1150 to 1350 to 1450) is divided into two phases—the Soho and Civano. The Classic period exhibits substantial changes in artifact styles, mortuary practices, settlement patterning, and architecture, including adobe-walled rooms and compounds. Agricultural practices intensified during the Classic period. A late Classic or post-Classic occupation, labeled the Polvorón phase, has been identified at a few sites in the Phoenix Basin (Chenault 1996; Crown and Sires 1984; Sires 1983). Researchers are still struggling with the interpretation of this phase (for example, Chenault 2000; Craig 1995; Henderson and Hackbarth 2000), which is represented by clusters of pit houses, sometimes constructed on top of apparently abandoned residential compounds and even on platform mounds. High quantities of obsidian, Salado Polychrome, red-on-brown decorated ceramics, and often a few Hopi yellow ware ceramics also are characteristic of sites dating to this period.

Ethnohistoric Period

When Europeans first arrived in the Phoenix area, they found no permanent occupants (Cable 1990). The basin was the contested boundary of territories used by the Yavapai, who lived to the north and west; the Apache, who occupied uplands to the east; and Akimel O'odham (Pima) villagers, who resided along the Gila River to the south. The Yuman-speaking Pee Posh (Maricopa), who migrated from the west along the lower Gila River, also joined the Akimel O'odham in the mid-nineteenth century.

Determining the relationship between these ethnohistoric groups and the preceding Hohokam has been archaeologically challenging (Bostwick and others 1996). Based on O'odham and Hopi oral traditions (for example, Bahr and others [1994]), Teague (1993) argues that social turmoil was a key factor in the final demise of the Hohokam. Although few protohistoric and historic-period Piman sites have been identified and investigated in southern Arizona, recent archaeological investigations (Bostwick and others 1996; Henderson 1995a, 1995b) suggest that there may be technological similarities between Hohokam and historic-period Piman ceramics that support a continuum from the Hohokam to the Pima, but Rea (1997:6-8) reports contradictory oral history.

Historic Period

De Niza and Coronado led expeditions through southeastern Arizona in 1539 and 1540, but Spanish colonization of southern Arizona began much later. In the late 1600s, Father Eusebio Kino established missions at Tumacacori, Guevavi, San Xavier del Bac, and San Cayetano, but Spanish settlement never expanded north of the Tucson area, except for a missionary effort among the Hopi from 1629 to 1680 (Spicer 1962:190-194).

Spanish rule of the area ended with the Mexican Revolution in 1821, but Hispanic settlers continued to live much as they had under Spanish rule although the inability of the new government to continue issuing food rations to Apaches led to renewal of conflicts. In 1848, much of what is now the American Southwest was ceded to the United States at the end of the War with Mexico, and more area south of the Gila River was acquired through the Gadsden Purchase, which was ratified in 1854 (Sheridan 2012).

The 1860s brought a mining boom and, consequently, an end to the area's relative isolation (Pry 1997). The Mexican and Anglo miners who came to the region feuded with each other over access to gold deposits, water, and timber, but they were united in their hostility toward the Apaches, who resisted the newcomers. The U.S. Army established Fort McDowell along the lower Verde River in 1865 to control Apache raiding. The conflict continued for more than a decade, but by the 1870s, most of the resisting groups had surrendered and been relocated to reservations (Carlson 1988:21-27).

The Yavapai initially tried to avoid the new settlers, but were often mistaken for Apaches. When two Yavapai boys were killed after wandering into a mining camp, the Yavapai went on the offensive. Skirmishes continued until 1872, when the Yavapai suffered a devastating defeat at Skull Cave. The Yavapai were then transferred to the reservation at Rio Verde and then moved to the San Carlos Apache Reservation until reservations were established for them in their own traditional territory (Pry 1997).

The Army and the miners created a market for food and supplies (Luckingham 1989:12-13), and farmers and ranchers soon followed. Jack Swilling, with the help of other residents of Wickenburg, a mining community 50 miles northwest of the valley, organized the Swilling Irrigating and Canal Company and in 1867 began excavating an irrigation canal amid the remnants of Hohokam canals near the location of the modern Phoenix airport. He often is referred to as the Father of Phoenix because of his efforts in restoring the agricultural splendor of the aboriginal Hohokam culture (Luckingham 1989:13-14). The success of the Swilling canal soon brought other settlers to the valley.

The Phoenix townsite was laid out in 1870. Settlement was based primarily on irrigation agriculture, but Phoenix grew to be a commercial and governmental center (Luckingham 1989; Mawn 1979). Growth and prosperity led to the designation of Phoenix as the territorial capital in 1889. By 1910, Phoenix had a population of 11,150 and was the third largest city in the territory (Sargent 1988); only Tucson and the Clifton/Morenci mining community were larger. With a population of 29,100 by 1920, Phoenix had become Arizona's largest city. The tourism industry was launched in the 1920s, but agriculture continued to dominate the economy.

Similar to the early days of Phoenix, Tempe also began as an agricultural community created by homesteaders moving into the area and developing canal systems, following those of their Hohokam predecessors on the south side of the Salt River. Charles T. Hayden established the Hayden Milling and Farming Ditch Company in November 1870. Hayden began excavating a ditch near Tempe Butte to power a flour mill. William Kirkland and James McKinney also excavated a short ditch in 1870, and in 1871 they joined forces with Hayden and the Tempe Irrigating Canal Company (originally organized as the Hardy Irrigating Canal Company) to develop the first major historic-era canal irrigation system on the south side of the river. This Tempe Canal was extended to provide outlying farmers with irrigation water as the settlement expanded. Early settlers included both Anglo-Americans and Mexican-Americans. Hispanic residents of the Barrio San Pablo (Barrio al Centro) community on the east side of Tempe worked in exchange for water rights, and secured employment with valley residents, including Charles Hayden (Aguila 1999:4; Jones 2011; Smith 1990).

In 1872, Hayden established a ferry crossing of the Salt River and a store near Tempe Butte at the north end of the modern-day Tempe downtown. Soon after, he built a flour mill, and a post office called Hayden's Ferry was established. Located about 8 miles east of Phoenix and across the river, Hayden's Ferry became an important transportation and agricultural center and the name of the settlement was changed to Tempe in 1879. Tempe became a center of education for the territory in 1885, when the state legislature appropriated funds for the Territorial Normal School at Tempe (renamed Normal School of Arizona in 1895 and then the Tempe Normal School of Arizona in 1903). The arrival of the railroad in 1887 strengthened Tempe's role as a transportation center for the Salt River Valley (Aguila 1999:3-4).

Farmers in the Tempe area and throughout the Salt River Valley benefited from increased reliability of the water supply and flood protection when Roosevelt Dam was completed in 1911, which was a major factor in Arizona achieving statehood in 1912. Tempe, however, grew much more slowly than Phoenix. From 1910 to 1930, Tempe's population increased from 1,500 to only 2,500. The community consisted largely of farmers and students at the Tempe Normal School, and agriculture dominated the economy of Tempe until after World War II.

In 1925, the Normal School was renamed the Tempe State Teacher's College, and in 1928 the Arizona State Teacher's College at Tempe, reflecting its growth. The Great Depression had relatively little adverse effect in Tempe. During the 1930s, more people moved into the city hoping to find economic success or cures for health problems. During World War II, Tempe continued as a community based in agriculture and education. The growth of businesses along the city's main street, Mill Avenue, and a small surrounding residential area stagnated due to wartime restrictions on building materials. Attendance at Arizona State Teacher's College declined as young men went to war.

Dramatic growth after the war more than made up for the minor economic slump that Tempe experienced during the war. By 1950, the Tempe population increased to 7,700—more than 160 percent greater than the 1940 population. Many military personnel, who had been stationed in Arizona during World War II, relocated to Tempe, and many became students, taking advantage of the GI Bill and crowding into Arizona State College at Tempe, as it was renamed in 1945 (and subsequently designated as ASU in 1959). The growing population after the war led to the development of new housing subdivisions, and new industrial

parks and high technology industries also came to the valley. Transportation to, from, and through Tempe remained important as the city grew. Apache Boulevard was designated as part of U.S. Highway 60, as well as a common segment of other highways, and played a key role in connecting Tempe with Phoenix to the west and Mesa to the east. Today, Tempe is Arizona's eighth largest city with a population of more than 160,000, surrounded by the numerous other cities that make up the Phoenix metropolitan area, which, with a population of almost 4.3 million, is the nation's thirteenth largest metropolitan area.

RECORDS REVIEW

Methods

A records review was conducted to compile information about prior cultural resource studies and cultural resources recorded within the power plant parcel and a surrounding area 1 mile (1.6 km) wide. The information was mapped in a geographic information system database. Digital data were obtained from the AZSITE Cultural Resource Inventory, a geographic information system database that includes records of the AZSITE Consortium members (Arizona State Museum [ASM], ASU, Museum of Northern Arizona, and SHPO), and participating agencies such as the Bureau of Land Management (AZSITE Consortium 2013). AZSITE includes information about properties listed in the Arizona Register and National Register of Historic Places (National Register). Records at ASU also were checked to follow up on a suggestion that an archaeological investigation might have been conducted prior to the development of the ASU Karsten Golf Course, adjacent to the power plant parcel, but not incorporated into the AZSITE database. The listings of the Tempe Historic Property Register (Tempe Register) and other data on the Tempe Historic Preservation Office website were checked as well. General Land Office plats on file at the Bureau of Land Management Arizona State Office and other historic maps and aerial photographs also were examined for indications of potential unrecorded historical resources. Selected reports of prior studies were reviewed.

Prior Cultural Resource Studies

Archaeological studies in the vicinity of the power plant parcel began with the 1886 to 1889 Hemenway Southwestern Archaeological Expedition (Haury 1945). The nonnative settlers who came to the Salt River Valley in the late 1860s and early 1870s recognized a large archaeological site southeast of Tempe (Hayden) Butte and in 1887 they showed it to Frank Cushing, director of the Hemenway expedition (Hinsley and Wilcox 2002). The expedition mapped a prehistoric canal in the vicinity of Tempe Butte, but did not further investigate the site (Haury 1945:40).

Perhaps as early as 1878, Herbert Patrick, a local engineer who worked for various canal companies and served as the Commissioner of Immigration for the Arizona Territory, began mapping prehistoric sites and irrigation canals in the Salt River Valley. He may have issued maps as early as 1884, but the earliest surviving one was published in 1903. That map depicts ruins of cities along what he called Ancient Canal Number 9, which was an irrigation canal that passed through the southern edge of the power plant parcel (Howard 1991:2.9, 2.17).

A quarter century later, Omar Turney (1929) first named the site southeast of Tempe Butte. On his map of prehistoric irrigation canals he labeled it La Plaza, but also referred to it as La Plaza de Tempe or Plaza Tempe in the text of his monograph on archaeological sites of the Salt River Valley. Turney (1929:88) reported that "of the three large buildings at the Plaza Tempe, nothing remains except the vestiges of the northwest one, in the edge of town," and he quoted James Goodwin, a local farmer who had worked with the Hemenway Expedition to map prehistoric sites and canals, as having described the site as a "large pueblo and many small houses" (Turney 1929:88). Turney's map depicts the large "communal or temple" building (platform mound) that remained partially intact, and a second one about 0.5 mile (0.8 km) to the southeast. His map shows the ruins of several other prehistoric buildings at the site, but they probably were only schematic (Howard 1991-2.17).

Turney's protégé, Frank Midvale, later identified the third platform mound at the site, but labeled the site on his 1966 map of Hohokam sites and canals as one of the less well known or smaller Hohokam villages. During the 1920s, Midvale and perhaps other researchers of the Gila Pueblo Archaeological Foundation recorded archaeological sites within La Plaza and on the adjacent Tempe Butte. One site also was recorded in the Pueblo Grande Museum site files in 1939 after a local resident reported excavating a cremation and an inhumation in his yard within the La Plaza site (Kelley 1939).

The record review identified 65 "modern" cultural resource studies conducted within or overlapping the records review area (**Table 1, Figure 3**). One of those studies was conducted in the late 1950s, 3 in the 1970s, 5 in the 1980s, 16 in the 1990s, and the other 40 since 2000. Those studies were conducted primarily to address cultural resource management regulations.

Table 1. Prior Cultural Resource Studies

	Project Name/Number	Project Number	Scope	Results	References
1	1958 to 1960 ASU (Michael Harner) excavations	none	1 site	1 site, AZ U:9:3(ASU) (within La Plaza)	see Kwiatkowski and Wright 2004; Bruson-Hadley 2006
2	Wells Fargo Arena data recovery excavations	none	1 site	1 site, AZ U:9:72(ASU) (within La Plaza)	Bruder 1972; Hanson 1972
3	ASU parking lot data recovery	none	1 site	1 site, AZ U:9:73(ASU) (within La Plaza)	Stark 1974
4	Rio Salado survey	none	not mapped	3 previously recorded sites (AZ U:9:3, 72, and 73(ASU), and 11 sites discovered, 2 in records review area, AZ U:9:30 and 77(ASU)	see Brunson-Hadley 2006
5	ASU Nobel Science Library data recovery	none	data recovery	1 site, AZ U:9:87(ASU) [AZ U:9:64(ASM)] (within La Plaza)	Brunson 1981
6	ASU Goldwater Building data recovery	none	data recovery	remnants of historical residential and commercial buildings	James and Rice 1988a; James 1991
7	ASU Physical Sciences Building data recovery	none	data recovery	remnants of historical residential and commercial buildings	James and Rice 1988b
8	ASU dormitory testing	none	about 1 acre	1 site, AZ U:9:95(ASU)	Rice 1989
9	ASU Parking Structure No. 5 data recovery	none	1 site	1 previously recorded site, AZ U:9:72(ASU)	Rice and James 1989; Simon 1989
10	Salt River channelization overview and survey	none	not determined	1 previously recorded site, Terraced Butte site, AZ U:9:115(ASM) [AZ U:9:77(ASU)]; 1 newly recorded site, AZ U:9:80(ASM)	Stone 1990a, 1990b
11	Tempe Carrier Annex survey	7.2962.SHPO	about 6 acres	no sites	Rodgers 1990
12	ASU Sun Devil Stadium expansion data recovery	none	data recovery	1 site, AZ U:9:72(ASU) (within La Plaza)	Stone 1991
13	Rio Salado Parkway survey	1994-166.ASM	6 acres	no sites	Foster and Turner 1994
14	Hayden Road (McKellips Road to Red Mountain Freeway) survey	1995-261.ASM, 7.3285.SHPO	23 acres	no sites	Owens 1995b
15	Tempe Butte trail improvement survey	none	not determined	1 site, Tempe Glyph site, AZ U:9:114(ASM) [AZ U:9:30(ASU)]	Loendorf 1995
16	Tempe Butte petroglyphs study	none	not determined	232 petroglyph panels	Loendorf and Loendorf 1995
17	Elias-Rodriguez House testing	none	testing	1 site, AZ U:9:165(ASM) (within La Plaza)	Jackman Jensen and others 1996
18	University Village Apartments easement survey	1997-41.ASM	<1 acre	no sites	Telles 1997

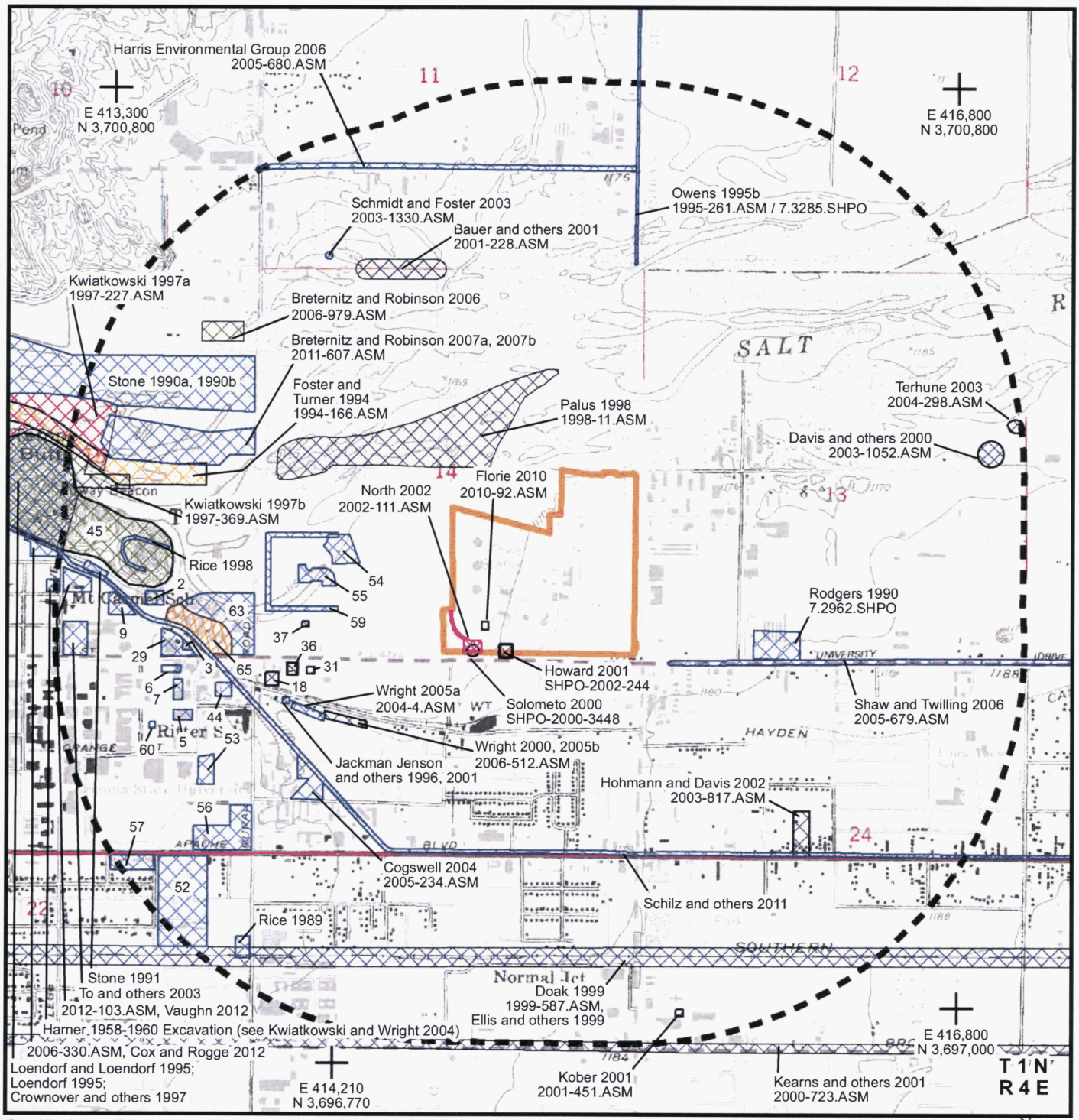
	Project Name/Number	Project Number	Scope	Results	References
19	Hayden's Ferry redevelopment area survey	1997-227.ASM	43 acres	2 previously recorded sites, Terraced Butte site [AZ U:9:115(ASM)] and Tempe Glyph site [AZ U:9:114(ASM)]	Hackbarth and Ruble 1997; Kwiatkowski 1997a
20	Rio Salado project buried power lines survey	1997-369.ASM	27 acres	no sites	Kwiatkowski 1997b
21	Tempe Butte trail improvement testing	none	not determined	1 site, Tempe Glyph site, AZ U:9:114(ASM) [AZ U:9:30(ASU)]	Crownover and others 1997
22	Peabody Hotel Group survey	1998-11.ASM	39 acres	no sites	Palus 1998
23	Tempe Butte Challenge Trail survey	none	1 acre	1 previously recorded site, Tempe Glyph site, AZ U:9:114(ASM) [AZ U:9:30(ASU), east locus]	Rice 1998
24	Pacific Bell Network fiber-optic line survey	1999-587.ASM	641 acres	7 previously recorded sites; 14 sites discovered, none in records review area	Doak 1999
25	Williams fiber-optic project survey	none	10,346 acres	138 sites, 1 in records review area, Phoenix main line, Southern Pacific Railroad [AZ T:10:84(ASM)]	Ellis and others 1999
26	AT&T NexGen/Core Project fiber-optic line survey	2000-723.ASM	866 acres	28 previously recorded sites, 1 in records review area, Phoenix main line, Southern Pacific Railroad; 8 sites discovered, none in records review area	Kearns and others 2001
27	1007-1115 E. 8th Street survey	SHPO-2000-2297	2 acres	1 previously recorded site, La Plaza [AZ U:9:165(ASM)]	Wright 2000
28	Verizon PHX-168A cell tower survey	SHPO-2000-3448	<1 acre	no sites	Solometo 2000
29	ASU 2000 North Dormitory data recovery	none	data recovery	1 site, AZ U:9:73ASU), 13 Hohokam features, including burials; 22 historical features (within La Plaza)	Jacobs 2001
30	Salt River Project PM-10 Roads survey	2001-228.ASM	80 acres	no sites	Bauer and others 2001
31	Tempe Storage cell tower survey	2001-360.ASM	<1 acre	1 previously recorded site, La Plaza [AZ U:9:165(ASM)]	Slawson 2001
32	1820 E. Broadway Road cell tower monitoring	2001-451.ASM	<1 acre	no sites	Kober 2001
33	Elias-Rodriguez House data recovery	none	data recovery	1 site, AZ U:9:165(ASM) (within La Plaza)	Jackman Jensen and others 2001
34	El Paso Natural Gas 2214 line pig-launcher survey	2002-111.ASM	1.5 acres	no sites	North 2002
35	Ocotillo Power Plant cell tower survey	SHPO-2002-244	<1 acre	no sites	Howard 2001
36	ASU Two cell tower survey	SHPO-2002-1273	<1 acre	no sites	Adamson and Dobschuetz 2002
37	World Gym cell tower survey	SHPO-2002-2828	<1 acre	no sites	Slawson 2002
38	1934 to 1944 E. Apache Boulevard survey	2003-817.ASM	2.8 acres	no sites	Hohmann and Davis 2002
39	Rio Salado Parkway/ McClintock Drive cell tower survey	2003-1052.ASM	<1 acre	no sites	Davis and others 2000
40	Sun Devil communications tower survey	2003-1330.ASM	<1 acre	no sites	Schmidt and Foster 2003
41	ASU Alumni Foundation data recovery	none	3 acres	2 sites, AZ U:9:265 and 266(ASM)	To and others 2003
42	Dos Gringos project monitoring	2004-4.ASM	monitoring	1 site, La Plaza [AZ U:9:165(ASM)]	Wright 2005a
43	Rio Salado cell tower survey	2004-298.ASM	1 acre	no sites	Terhune 2003
44	ASU Research Services Laboratory discovery	none	<1 acre	Hohokam midden, roasting pit, and inhumation (within La Plaza)	Rice 2004
45	Tempe Butte review and survey	none	17 acres	17 locations within previously recorded Tempe Butte site, AZ U:9:30(ASU)	Kwiatkowski and Wright 2004

	Project Name/Number	Project Number	Scope	Results	References
46	Lemon Street and Terrace Road survey	2005-234.ASM	2.75 acres	1 previously recorded site, AZ U:9:165(ASM), and 1 site discovered, AZ U:9:269(ASM)	Cogswell 2004
47	University Drive (Casitas Drive to Evergreen Road) survey	2005-679.ASM	not determined	1 previously recorded site, La Cuenca del Sedimento [AZ U:9:68(ASM)]	Shaw and Twilling 2006
48	Curry Road (Scottsdale Road to McClintock Drive) survey	2005-680.ASM, SHPO-2006-1546	5 acres	no sites	Harris Environmental Group 2006
49	Tempe Transportation Center data recovery	2006-330.ASM	data recovery	1 site, La Plaza [AZ U:9:165(ASM)]	Cox and Rogge 2012
50	El Adobe Apartments data recovery	2006-512.ASM	data recovery	1 site, La Plaza [AZ U:9:165(ASM)]	Wright 2005b
51	Club Rio survey	2006-979.ASM	15 acres	no sites	Breternitz and Robinson 2006
52	ASU south campus dormitory, testing	none	about 15 acres	no sites	Steinbach 2006
53	ASU Interdisciplinary Science and Technology Building IV testing	2008-389.ASM	5 acres	1 site, AZ U:9:284(ASM)	Steinbach, Watkins, and Bustoz 2008
54	ASU new recreation field testing	none	4 acres	no sites	Steinbach and Watkins 2008a
55	ASU Weatherup Athletic Center testing	none	2 acres	no sites	Steinbach and Watkins 2008b
56	ASU Barrett Honors College testing and data recovery	none	9 acres	1 site, AZ U:9:281(ASM)	Steinbach, Watkins, and Rice 2008
57	Ocotillo Hall data recovery	none	3 acres	1 site, AZ U:9:296(ASM)	Bustoz and Cureton 2009
58	Patriot cell tower surveys	2010-92.ASM	<1 acre	no sites	Florie 2010
59	ASU athletic fields water line monitoring	none	<1 acres	no sites	Rockhill and Rice 2010
60	ASU high resolution transmission electron microscope facility testing	none	<1 acre	no sites	Steinbach and Rice 2010
61	Marina Heights survey	2011-607.ASM	36 acres	no sites	Breternitz and Robinson 2007a, 2007b
62	Valley Metro light rail data recovery	none	data recovery	29 sites, 1 in records review area, La Plaza [AZ U:9:165(ASM)]	Schilz and others 2011
63	ASU Alpha Drive development data recovery	none	11 acres	1 site, La Plaza [AZ U:9:165(ASM)]	Rice and others 2011
64	Beal Derkenne housing development monitoring	2012-103.ASM	monitoring	1 site, La Plaza [AZ U:9:165(ASM)]	Vaughn 2012
65	ASU South Alpha Drive development data recovery	none	6 acres	1 site, La Plaza [AZ U:9:165(ASM)]	Rice 2013

NOTE: ASU = Arizona State University

Four of the prior studies were within the power plant parcel, but all were of limited scope. Three were surveys for wireless telecommunications facilities (Florie 2010; Howard 2001; Solometo 2000) and the other was for a natural gas pipeline pig-launcher facility (North 2002). All together those surveys probably covered fewer than 2 acres (0.8 hectare) in the southwest corner of the parcel. None discovered any archaeological or historical sites, but the areas surveyed were highly disturbed by development.

Dr. Alfred Dittert of the ASU faculty directed a survey by students in 1977 for the proposed Rio Salado project. That survey is not included in the AZSITE database, but a summary report indicates undeveloped areas east and west of the power plant were surveyed and no sites were discovered (Brunson-Hadley 2006).



Base Map Source: Tempe, Arizona, USGS 7.5' Quadrangles(33111d81\U:90 NW) NAD 1927, UTM Zone 12, Gila and Salt River Meridian
Canal Source: Howard 1992

N

0 1,000 2,000 3,000 Feet

0 250 500 750 1,000 Meters

Study Caption

Numbered same as Table 1.
Prior Cultural Resource Studies

2 Bruder 1972; Hanson 1972
3 Stark 1974
5 Brunson 1981
6 James and Rice 1988a; James 1991
7 James and Rice 1988b
9 Rice and James 1989; Simon 1989
18 1997-41.ASM, Telles 1997
29 Jacobs 2001
31 2001-360.ASM, Slawson 2001
36 SHPO-2002-1273, Adamson and Dobschuetz 2002
37 SHPO-2002-2828, Slawson 2002
44 Rice 2004
45 Kwiatkowski and Wright 2004
52 Steinbach 2006
53 2008-389.ASM, Steinbach, Watkins, and Bustoz 2008
54 Steinbach and Watkins 2008a
55 Steinbach and Watkins 2008b
56 Steinbach, Watkins, and Rice 2008
57 Bustoz and Cureton 2009
59 Rockhill and Rice 2010
60 Steinbach and Rice 2010
63 Rice and others 2011
65 Rice 2013

Legend

Prior Project (any hatch pattern and color)
Project Parcel
Records Review Area

Prior Cultural Resource Studies
Figure 3

The results of that survey were used in 1988 to determine that no archaeological resources would be affected by the then proposed development of the ASU Kartsten Golf Course and no additional survey was conducted (Arleyn Simon, Archaeological Research Institute, ASU, personal communication, 17 July 2013.) After the development of the Tempe Town Lake, more recent surveys covered about 75 acres (30.4 hectares) on the south side of the lake and northwest of the power plant parcel, and found no sites (Breternitz and Robinson 2007a, 2007b; Palus 1998).

Many of the other prior studies were archaeological excavations in conjunction with construction of buildings on the ASU campus or other nearby commercial and residential developments. Many of those investigated areas were assigned individual site numbers but are now considered part of the La Plaza site. Two recent excavations conducted to mitigate impacts of constructing the light rail transit project (Schilz and others 2011) and the Tempe Transportation Center adjacent to the light rail (Cox and Rogge 2012) discovered many house remnants and burials reflecting long-term habitation of the La Plaza site.

Five other archaeological excavation and monitoring projects within approximately 0.5 mile (0.8 km) to the west of the power plant parcel are of more direct relevance because they are on the same river terrace—the Lehi terrace, which is only about 5 feet (1.5 m) above the bed of the Salt River (Wellendorf and others 1986). The evidence of habitation at the La Plaza site is on the higher Mesa river terrace, which is about 10 to 15 feet (3.0 to 4.5 m) above the river bed. Three of those projects documented that the migrating river channel had scoured away part of the Lehi terrace east of Tempe Butte during the early twentieth century (Rockhill and Rice 2010; Steinbach and Watkins 2008a, 2008b). (That scouring did not extend eastward far enough to reach the power plant parcel.) Another project overlapped the scoured channel and the Lehi terrace and found a canal, field house, hearth, and two pits, and documented Hohokam use of the low terrace for farming (Rice and others 2011). The fifth project overlapped the boundary between the Lehi and Mesa terrace and found evidence of Hohokam farming on the Lehi terrace, and evidence of more permanent habitation confined to the higher Mesa terrace (Rice 2013).

Three other excavations conducted in conjunction with development of ASU facilities designated three small archaeological sites just south of the La Plaza site and those too reflect field activities (Bustoz and Cureton 2009; Rice 1989; Steinbach and others, eds. 2008). Other recent studies involved survey on Tempe (Hayden) Butte, which the City of Tempe has designated as a preserve and was recently listed in the National Register.

Several other prior studies were surveys of narrow corridors for street or utility projects, and most of those identified no archaeological sites. Kwiatkowski and Wright (2004), Wright (2005b), Punzmann (2011), and Cox and Rogge (2012) provide more detailed reviews of prior studies in the area.

Previously Recorded Archaeological Resources

The records review identified 15 archaeological sites recorded within the records review area (**Table 2**, refer to Figure A-1). Nine of the sites, however, are now considered part of the single large site of La Plaza/Barrio San Pablo, which is designated AZ U:9:165(ASM). Two others can be considered part of a consolidated Tempe Butte site.

Howard's (1991) map of major Hohokam sites and canals plotted the La Plaza site as covering a vast area about 0.6 mile (1 km) wide and 1.6 miles (2.5 km) long, south and southwest of the power plant parcel. [Rice and others (2011) documented that flood flows during the early to middle twentieth century eroded away part of the La Plaza site east of Tempe Butte, and adjusted the site boundary to eliminate the eroded part of the site that is no longer extant.] Howard also mapped three platform mounds within the site, which along with its size, suggests La Plaza must have been one of the most important Hohokam villages in the Phoenix basin. Urban development now masks the site and the size of the site and information about the platform mounds remains ambiguous.

Table 2. Archaeological Sites Recorded in the Records Review Area

	Site Name/Number	Affiliation and Age	Site Type	National Register of Historic Places Status	Reference
1	AZ U:9:3(ASU), within La Plaza site	Hohokam, Classic period	village	excavated in 1958 to 1960, no longer extant	see Kwiatkowski and Wright 2004; Brunson-Hadley 2006
2	AZ U:9:20(PG), within La Plaza site	Hohokam	1 cremation, 1 inhumation	burials excavated, no longer extant	Kelley 1939
3	AZ U:9:64(ASM) [AZ U:9:87(ASU)], within La Plaza site	Hohokam; Euro-American	3 Hohokam inhumations, 1 cremation, 3 canals, potsherds, flaked stone, and ground stone; historical house foundation and artifacts	excavated, no longer extant	Brunson 1981
4	La Cuenca del Sedimento, AZ U:9:68(ASM)	Hohokam	farmstead/field house and canals (Las Acequias/Los Muertos system)	excavated, no longer extant	Masse 1987; Ackerly and Henderson 1989; Henderson 1989
5	AZ U:9:72(ASU), within La Plaza site	Hohokam	11 pit houses, cemetery area	excavated, no longer extant	Bruder 1972; Hanson 1972; Stone 1991
6	AZ U:9:73(ASU), within La Plaza site	Hohokam	burials, potsherds, flaked stone, ground stone, and shell	excavated, no longer extant	Stark 1974
7	AZ U:9:95(ASU)	Hohokam; Euro-American	2 Hohokam canals; early twentieth-century trash pit	excavated, no longer extant	Rice 1989
8	Tempe Glyph site, AZ U:9:114(ASM), AZ U:9:30(ASU), Mesa 1:4 and 9 (GP), within Tempe Butte site	Hohokam	petroglyphs	eligible, Criterion D	Kwiatkowski and Wright 2004
9	Terraced Butte site, AZ U:9:115(ASM), AZ U:9:77(ASU), Mesa 1:5 (GP), within Tempe Butte site	Hohokam	habitation, petroglyphs, and terraced gardens	eligible, Criterion D	Kwiatkowski and Wright 2004
10	La Plaza/Barrio San Pablo (al Centro), AZ U:9:165(ASM)	Hohokam; Euro-American	Hohokam village; historical Hispanic neighborhood	eligible, Criterion D	Jackman Jensen and others 1996; Wright 2005a; 2005b; Schilz 2011; Cox and Rogge 2012
11	AZ U:9:265(ASM), within La Plaza site)	historic Mexican American	2 house floors, 4 foundations, trash pits within Barrio San Pablo	eligible, Criterion D, excavated, no longer extant	To and others 2003
12	AZ U:9:266(ASM), within La Plaza site)	Hohokam	2 hearths and artifact scatter	eligible, Criterion D, excavated, no longer extant	To and others 2003
13	AZ U:9:281(ASM)	Hohokam	24 features, including 2 field houses, 2 canals, pits, and 3 burials	eligible, Criterion D, excavated, no longer extant	Steinbach and others, eds. 2008
14	AZ U:9:284(ASM), within La Plaza site	Hohokam	3 hearths, 1 trash pit, artifact scatter	excavated, no longer extant	Steinbach and others 2008
15	AZ U:9:296(ASM)	Hohokam	field area with 3 trash pits, 1 thermal pit, 1 puddling pit	eligible, Criterion D, excavated, no longer extant	Bustoz and Cureton 2009

Although only a small percentage of La Plaza has been excavated, the evidence indicates it was a sizeable village occupied from the Pioneer through the Classic periods. La Plaza, however, generally is not considered among the primary Hohokam villages of the Salt River Valley, which include Los Muertos, Pueblo Grande, Mesa Grande, and Las Colinas.

Rice and Jacobs (2001) pointed out that almost all evidence of habitation at La Plaza is limited to the area along Canal Tempe, the name that Midvale (1966) gave to the main irrigation canal that passed through the

northern part of the site. They argued that inclusion of the southern two-thirds or more of the site, which probably was only fields, exaggerated the size of the village.

Recent investigations along the light rail transit corridor through the entire length of the site found many archaeological features in the northwestern part of the site, consistent with prior studies, but almost nothing in the southeastern two-thirds (Punzmann 2011). Although the light rail transit investigations found no evidence of the platform mound that Turney had described as partially intact in the 1920s, the study did identify maps and aerial photographs that documented where remnants of the mound had survived into the 1950s and the light rail transit excavations found numerous archaeological features in the vicinity to support the documentary evidence. In contrast, that study found no evidence of the second platform mound even though the study corridor passed through the area where Turney had mapped the mound (Stuart 2011).

The La Plaza site includes not only remnants of a Hohokam village, but also features of the historic Barrio San Pablo (also known as Barrio al Centro). The La Plaza site has been evaluated as eligible for the National Register under Criterion D for its potential to yield important information.

Numerous sites also have been designated on Tempe Butte, and are currently consolidated in the AZSITE database as the Tempe Glyph site, AZ U:9:114(ASM) and the Terraced Butte site, AZ U:9:115(ASM). Those two sites also can be considered part of a large site encompassing virtually all of Tempe Butte. About 59 acres (23.9 hectares) of the butte, which is owned by the City of Tempe, was listed in the National Register under Criteria C and D in 2011, and the city has designated that part of the butte as the Hayden Butte Park Preserve.

Three other archaeological sites recorded just south of the La Plaza site (refer to Figure A-1), as well as the result of the light rail transit investigations in the southeastern part of the site, lend support to the observation of Rice and Jacobs (2001) that much of the southern and southeastern part of the La Plaza site is probably limited to fields rather than permanent habitation. Two Hohokam canals and a twentieth-century trash pit were identified at site AZ U:9:95(ASU) (Rice 1989). Features documented at site AZ U:9:281(ASM), a Hohokam field house site, included two field houses, two canals, use surfaces, pits, two cremations (subadult and young adult), and an infant inhumation (Steinbach and others, eds. 2008). Three trash filled pits, a thermal pit, and a puddling pit were documented at site AZ U:9:296(ASM), which also was interpreted as a field activity area (Bustoz and Cureton 2009).

The other recorded site in the records review area is La Cuenca del Sedimento, AZ U:9:68(ASM). That site, which is about 1 mile (1.6 km) southeast of the power plant parcel, is a Classic Period Hohokam farmstead or field house site with irrigation canal features that are part of the Las Acequias/Los Muertos system (Ackerly and Henderson 1989; Henderson 1989; Masse 1987).

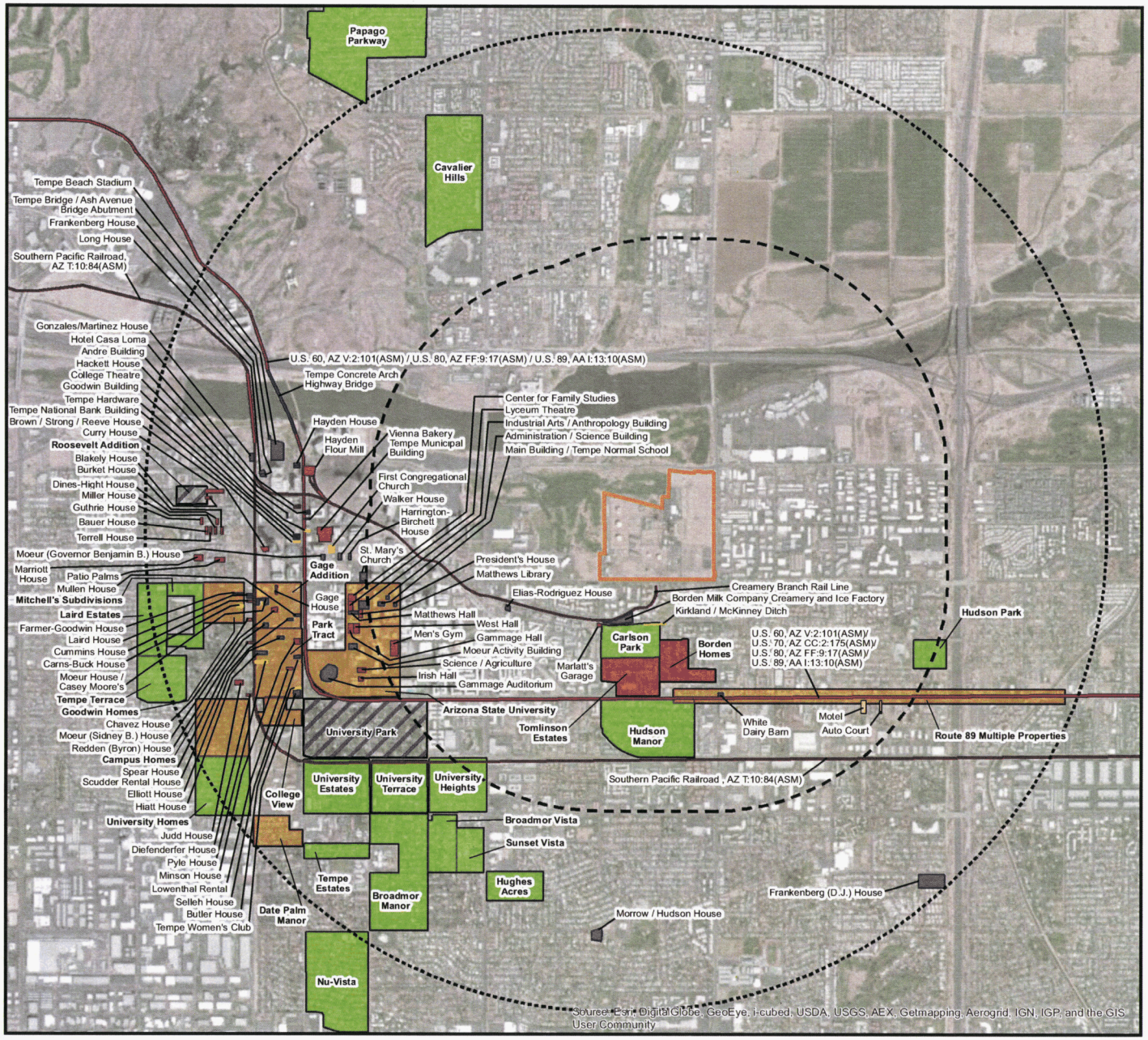
Howard's (1991) map indicates that the northernmost canal that supplied water to La Plaza passed through the southern part of the power plant parcel (refer to Figure A-1). Although construction of the power plant and other facilities have involved considerable ground disturbance, it is possible that remnants of the relict canal might be buried within the parcel.

Previously Recorded Historic Buildings, Structures, and Districts

In addition to archaeological resources, the records review compiled information about historic buildings, structures, and districts.

Historic Resources within 1 Mile

The review identified 24 historic buildings, structures, and districts recorded within 1 mile (1.6 km) of the power plant parcel (**Figure 4, Table 3**).



Legend

- Power Plant
- 1-Mile Records Review Area
- 2-Mile Records Review Area

District

- Listed in National Register of Historic Places
- Listed in Tempe Historic Property Register
- Eligible for National Register of Historic Places or Tempe Historic Property Register
- Warrants Further Consideration

Individual Property

- Listed in National Register of Historic Places
- Listed in Tempe Historic Property Register
- Eligible for National Register of Historic Places or Tempe Historic Property Register

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0 500 1,000 1,500 Meters

0 0.5 1 Miles

Historic Buildings, Structures, and Districts
Figure 4

Table 3. Historic Buildings, Structures, and Districts within 1 Mile

	Site Name/Number	Description	National Register Status	Reference
Listed in the National Register				
1	Administration/Science Building (Arizona State University District)	Richardsonian Romanesque-style building constructed in 1909, 451 E. University Drive	listed, Criteria A and C	Ryden 1997
2	Borden Milk Company Creamery and Ice Factory	Mission Revival-style dairy building built in 1892, 1300 to 1360 E. 8th Street	listed, Criteria A and C	Janus Associates 1983; Ryden 1997
3	Elias-Rodriguez House AZ U:9:165(ASM)	Sonoran-style/ vernacular adobe house built circa 1882, 927 E. 8th Street	listed, Criterion C; also listed in Tempe Register	Janus Associates 1983; Ryden 1997
4	Industrial Arts, Anthropology Building (Arizona State University District)	Neoclassical Revival-style building constructed in 1914, 900 S. College	listed, Criteria A and C	Ryden 1997
5	Main Building, Tempe Normal School (Old Main) (Arizona State University District)	Victorian-style building with Queen Anne characteristics built between 1894 and 1898, 400 E. Tyler	listed, Criteria A and C	Ryden 1997
6	President's House/Arizona State University Archives, (Arizona State University District)	Colonial Revival-style residence constructed in 1907, 450 E. Tyler	listed, Criterion C	Ryden 1997
7	St. Mary's Church/Our Lady of Mt. Carmel Catholic Church, AZ U:9:62(ASM)	Romanesque-style church constructed in 1903, 230 E. University Drive	listed, Criterion C; also listed in Tempe Register	Janus Associates 1983; Ryden 1997
8	University Park District	1946 to 1956 residential subdivision roughly bounded by Apache Boulevard, railroad, Mill Avenue, and McAlister	listed, Criteria A and C	Solliday 2001
9	White (E.M.) dairy barn	river-cobble dairy barn constructed in 1919; converted to commercial use in the 1930s, 1810 E. Apache Boulevard	listed, Criterion A; also listed in Tempe Register	Janus Associates 1983; Ryden 1997
Determined Eligible for the National Register				
10	Arizona State University District	educational buildings approximately bounded by S. Palm Walk, Mill Avenue, Forest Avenue, University Drive, Gammage Parkway, and Apache Boulevard	7 listed properties, 8 individually eligible properties, 1 contributor	Ryden 1997
11	Creamery Branch rail line [Phoenix, Tempe, & Mesa Railway; Phoenix & Eastern Railroad]	railroad lines built in 1895 and 1903	eligible, Criterion A, but little remains extant	Rogge and others 2002
12	Marlatt's Garage	commercial box-style building constructed in 1922, 1249 E. 8th Street	individually eligible, Criteria A and C	Ryden 1997
13	Men's Gym (Arizona State University District)	gymnasium with characteristics of the International style, constructed in 1927, 451 E. Orange	individually eligible, Criterion C	Ryden 1997
14	Phoenix main line, Southern Pacific Railroad AZ T:10:84(ASM)	1926 railroads built to serve Phoenix	eligible, Criterion A	Harmon and Beyer 1995
15	Route 89 Multiple Properties	6 buildings along U.S. Highway 89 associated with tourism (4 automobile courts, 1 motel, 1 tavern)	eligible, Criterion A	Ryden 1997
16	Tempe Canal/Hayden Canal/ Kirkland/McKinney Ditch, AZ U:9:189(ASM)	water power and irrigation canal excavated in 1870, mostly converted to buried pipe, but segment along old 8th Street between Gary Drive and Una Avenue remains open and designated by Salt River Project for preservation	eligible (as part of Salt River Project), Criterion A, open segment listed in Tempe Register as Kirkland/McKinney Ditch	Ryden 1997; Aguila 1998; Kwiatkowski 1999; Schilz 2011; Cox and Rogge 2012

Table 3. Historic Buildings, Structures, and Districts within 1 Mile

	Site Name/Number	Description	National Register Status	Reference
17	U.S. Highway 60 AZ V:2:101(ASM) U.S. Highway 70 AZ CC:2:175(ASM) U.S. Highway 80 AZ FF:9:17(ASM) U.S. Highway 89 AZ I:3:10(ASM)	multiplexed segment of 1912 to 1950 state highway system	eligible, Criterion D	Spalding and Lefthand 1995; Wright 1992, 1994; Wright and Woodall 1993; ADOT 2002
Tempe Register-Listed				
18	Borden Homes Subdivision	1947 to 1957 residential subdivision roughly bounded by Apache Boulevard, Orange Street, McClintock Drive, and alley west of Una Avenue	listed in Tempe Register	Solliday 2001
19	Tomlinson Estates Historic District	1950 to 1953 residential subdivision roughly bounded by Apache Boulevard, Lemon Street, Dorsey Road, and the alley west of Una Drive	listed in Tempe Register	Solliday 2001
Tempe Register- Warrant Further Consideration				
20	Carlson Park	1957 to 1959 residential subdivision bounded roughly by 8th Street, Don Carlos, Dorsey, and alley west of Una Avenue	potentially eligible, Criteria A and C	Solliday 2001
21	Hudson Manor	1948 to 1955 residential subdivision bounded roughly by Apache Boulevard and Union Pacific Railroad, Dorsey, and Elm Street	potentially eligible, Criteria A and C	Solliday 2001
22	Hudson Park	1958 to 1959 residential subdivision bounded roughly by Howe Street, Orange Street, Price Road, and Lola Lane	potentially eligible, Criteria A and C	Solliday 2001
23	University Heights	1954-1960 residential subdivision bounded roughly by Broadway Road and the Union Pacific Railroad, Rural Road, and Ventura Drive	potentially eligible, Criteria A and C	Solliday 2001
Unevaluated				
24	AZ U:9:269(ASM)	adobe house and outbuilding at 1010 Lemon Street, built circa 1906	demolished	Cogswell 2004

NOTES: National Register = National Register of Historic Places, Tempe Register = Tempe Historic Property Register, ADOT = Arizona Department of Transportation, ASU = Arizona State University

Nine of those are listed in the National Register. The closest to the power plant parcel are the Borden Milk Company Creamery and Ice Factory (Criteria A and C) and the Elias–Rodriguez House (Criterion C), which are about 0.1 and 0.4 mile (0.2 and 0.6 km) to the south and southwest, respectively. Five others are almost 1 mile (1.6 km) west of the power plant parcel, and include four listed buildings within the ASU District (Criterion C or Criteria A and C). The district has been evaluated as eligible but has not been listed. St. Mary's Church (Criterion C), adjacent to the district, also is listed. The other listed building is the White Dairy Barn (Criterion C) on Apache Boulevard, about 0.5 mile (0.8 km) south of the power plant parcel. The barn has been converted to commercial use and also is listed in the Tempe Register. The residential University Park District, developed between 1946 and 1956, is listed in the National Register under Criteria A and C. The district is about 1 mile (1.6 km) southwest of the power plant parcel.

Eight other properties within 1 mile have been determined to be eligible for the National Register. The closest to the power plant parcel is the Creamery Branch rail line (Criterion A). A spur line from the Creamery Branch used to deliver fuel to the Ocotillo Power Plant, but the spur, along with the rest of the line, has been abandoned. Only a few segments of the track south of University Drive remain partially intact. The Phoenix Main Line of the Southern Pacific Railroad (which continues to be operated by Union Pacific) also has been evaluated as eligible (Criterion A).

The Tempe Canal (Hayden Canal, Kirkland-McKinney Ditch) has been evaluated as eligible (Criterion A), but most of the canal in the vicinity of the power plant parcel has been buried in pipe. The exception is an open segment about 0.2 mile (0.3 km) south of the power plant parcel, which is considered eligible for the National Register as part of the Salt River Project system and is listed in the Tempe Register. The Salt River Project has designated that segment for preservation as an open ditch.

The Arizona Department of Transportation (2002) and SHPO previously agreed that the multiplexed U.S. Highways 60, 70, 80, and 89, as a component of the historic state highway system developed between statehood in 1912 and 1955, is eligible for the National Register under Criterion D for its potential to yield important information. The multiplexed highway, designated in Tempe as Apache Boulevard, is about 0.5 mile (0.8 km) south of the power plant parcel. Six buildings along the highway also have been evaluated as National Register eligible (Criterion A) because of their association with tourism.

The men's gym and the ASU District within which it is located also have been evaluated as National Register eligible. They are almost 1 mile (1.6 km) west of the power plant parcel. Marlatt's Garage, a commercial building constructed in 1922 about 0.2 mile (0.3 km) south of the power plant parcel, also has been evaluated as eligible for the National Register.

Two residential subdivisions are listed in the Tempe Register as historic districts. Borden Homes was developed between 1947 and 1957 and Tomlinson Estates was developed between 1950 and 1953 about one-fourth to one-third mile (0.4 to 0.5 km) south of the power plant parcel. The Tempe Historic Preservation Office has identified four other post-World War II subdivisions as warranting further evaluation as candidates for the Tempe Register. Those include Carlson Park, about 0.2 mile (0.3 km) south of the power plant parcel, and Hudson Manor, Hudson Park, and University Heights, which are more distant. An adobe house and outbuilding [designated AZ U:9:269(ASM)] reportedly constructed around 1906 were recorded about 0.5 mile (0.8 km) southwest of the power plant parcel. No documentation of the eligibility evaluation of that property or treatment of that property was identified, but a recent aerial photograph indicates the buildings have been demolished.

Historic Resources within 1 to 2 Miles

Project impacts on properties evaluated as register eligible for their potential to yield information usually can be satisfactorily mitigated by recovery and preservation of that information. Historic components of the built environment commonly are evaluated as eligible for other values and often there is more sentiment for preserving those properties in place and avoiding adverse impacts to such resources. Because modifications of the Ocotillo Power Plant might be perceived as having potential indirect impacts on the historic built environment beyond 1 mile, additional information about historic resources listed in or evaluated as eligible for the National Register and Tempe Register was compiled for the area between 1 and 2 miles from the power plant parcel. The review identified 87 additional properties, almost all of which are on the ASU campus or in the historic core of Tempe west of the power plant parcel (**Table 4**, refer to Figure 4).

Table 4. Historic Buildings, Structures, and Districts within 1 to 2 Miles

	Site Name/Number	Description	National Register Status	Reference
Listed in the National Register				
1	Andre Building, AZ U:9:58(ASM)	1900 Victorian/Neoclassical-style building, 401-403 S. Mill Avenue	listed, Criteria A and C	Janus Associates 1983
2	Elliott House	1929 Bungalow-style residence, 1010 S. Maple Avenue	listed, Criterion C	Janus Associates 1983; Ryden 1997
3	Farmer-Goodwin House, Goodwin Homes District	1886 adobe residence, 820 S. Farmer Avenue	listed, Criteria A and C; listed in Tempe Register	Janus Associates 1983; Ryden 1997

Table 4. Historic Buildings, Structures, and Districts within 1 to 2 Miles

	Site Name/Number	Description	National Register Status	Reference
4	Frankenberg House, AZ U:9:60(ASM)	1920 Neoclassical-style residence constructed with rusticated concrete block, moved to 150 S. Ash, originally at 129 E. University Drive	listed, Criterion C	Janus Associates 1983
5	Frankenberg (D.J.) House	1915 Western Colonial box-style residence, 2222 S. Price Road	listed Criteria B and C; listed in Tempe Register	Janus Associates 1983
6	Gammage (Grady) Auditorium, ASU District	1964 performing arts center designed by Frank Lloyd Wright, 1200 S. Mill Avenue	listed, Criterion C	Ryden 1997
7	Gonzales/Martinez House	1880 National Folk-style residence, 302 W. 1st Street	listed, Criterion C	Janus Associates 1983; Ryden 1997
8	Goodwin Building	1907 panel brick commercial-style building, 512-518 S. Mill Avenue	listed, Criteria B and C; listed in Tempe Register	Janus Associates 1983; Ryden 1997
9	Hackett (Roy) House, Tempe (Hildge) Bakery, AZ U:9:49(ASM)	1888 panel brick commercial-style building, 401-405 W. 4th Street	listed, Criteria A and C; listed in Tempe Register	Janus Associates 1983; Ryden 1997
10	Harrington-Birchett House	1895 Victorian/English Tudor Revival-style residence, 202 E. 7th Street	listed, Criterion C	Janus Associates 1983; Ryden 1997
11	Hayden (Charles T.) House, La Casa Vieja	1873 Mexican row house, 3 W. 1st Street	listed, Criteria A and C; listed in Tempe Register	Janus Associates 1983; Ryden 1997
12	Hiatt House, Park Tract District	1928 Georgian-style residence with Bungalow characteristics, 1104 Ash Avenue	listed, Criterion C; listed in Tempe Register	Janus Associates 1983; Ryden 1997
13	Laird (Hugh) House	1908 Neocolonial-style residence, 821 S. Farmer Avenue	listed, Criteria B and C	Janus Associates 1983; Ryden 1997
14	Long (Samuel C.) House	1910 Colonial Revival-style residence, moved to 150 S. Ash, originally at 27 E. 6th Street	listed, Criterion C	Janus Associates 1983
15	Matthews Hall, ASU District	1918 Neoclassical/Prairie School-style dormitory, 951 S. Forest	listed, Criteria A and C	Ryden 1997
16	Moeur (B.B.) Activity Building, ASU District	1939 Federal Moderne-style building, 201 E. Orange	listed, Criteria A and C	Ryden 1997
17	Moeur (Governor Benjamin B.) House	1892 Western Colonial box/Bungalow-style residence, (remodeled from Victorian style), 34 E. 7th Street	listed, Criterion B; listed in Tempe Register	Janus Associates 1983; Ryden 1997
18	Moeur (William A.) House, Gage Addition District	1910 Colonial Revival-style residence with Bungalow characteristics, 850 Ash Avenue	listed, Criterion B; listed in Tempe Register	Janus Associates 1983; Ryden 1997
19	Morrow (Thomas)/Hudson (E.W.) House	1904 Queen Anne Victorian-style residence, 1203 E. Alameda Drive	listed, Criteria B and C	Janus Associates 1983; Ryden 1997
20	Mullen (C.P.) House, Gage Addition Historic District	1924 Georgian Revival-style residence, 918 S. Mill Avenue	listed, Criterion C	Janus Associates 1983; Ryden 1997
21	Redden (Byron) House, Gage Addition District	1918 Bungalow-style residence, 948 Ash Avenue	listed, Criterion C	Janus Associates 1983; Ryden 1997
22	Roosevelt Addition District	1946 to 1950 subdivision on 3rd Street cul-de-sac west of Roosevelt Street	listed, Criterion C; listed in Tempe Register	Solliday, Jones, and Vargas 2009
23	Scudder (B.H.) Rental House	1919 prefabricated Bungalow-style residence, 919 S. Maple Avenue	listed, Criterion C	Janus Associates 1983; Ryden 1997
24	Selleh House	1940 Ranch-style residence, 1104 S. Mill Avenue	listed, Criteria B and C; listed in Tempe Register	Ryden 1997
25	Tempe Beach Stadium	1937 terraced, river-cobble bleachers, Ash Avenue at 1st Street	listed, Criterion A; listed in Tempe Register	Ryden 1997

Table 4. Historic Buildings, Structures, and Districts within 1 to 2 Miles

	Site Name/Number	Description	National Register Status	Reference
26	Tempe Concrete Arch Highway Bridge (Mill Avenue Bridge)	1931 reinforced concrete, arched bridge, Mill Avenue at Rio Salado	listed, Criterion A; listed in Tempe Register	Ryden 1997
27	Tempe Hardware/Curry Hall/ I.O.O.F. Hall	1898 Late Victorian/panel brick commercial style building, 520 S. Mill Avenue	listed, Criteria A and C; listed in Tempe Register	Janus Associates 1983; Ryden 1997
28	Tempe Bridge/Ash Avenue Bridge abutment, 7.135.SHPO	1913 historic bridge abutment, 1st Street and old Ash Avenue	listed, Criteria A and C; listed in Tempe Register	Ryden 1997
29	Tempe Women's Club, Park Tract District	1936 adobe clubhouse, 1290 S. Mill Avenue	listed, Criterion A; listed in Tempe Register	Janus Associates 1983; Ryden 1997
30	Vienna Bakery	1893 Spanish Colonial Revival-style building (originally Victorian style), 415 S. Mill Avenue	listed, Criteria A and C	Janus Associates 1983
31	Walker (Harry) House	1903 Neocolonial-style residence, 118 E. 7th Street	listed, Criterion C	Janus Associates 1983; Ryden 1997
Listed in the Tempe Register				
32	Carns-Buck House, Farmer's Addition District MPAEXP-9877	1914 Bungalow-style residence, 902 S. Farmer Avenue	listed in Tempe Register	Janus Associates 1983; Ryden 1997
33	Butler (Gray) House, Park Tract Historic District	1939 Ranch-style residence, 1220 S. Mill Avenue	listed in Tempe Register	Ryden 1997
34	College (Valley Art) Theater	1938 panel brick commercial-style theatre, 505-509 S. Mill Avenue	listed in Tempe Register	Ryden 1997
35	First Congregational Church	1948 Colonial Revival-style church, 101 E. 6th Street	listed in Tempe Register and Tempe Historic Landmark	Ryden 1997
36	Hayden flour mill and silos	1918 Industrial-style flour mill, 119 S. Mill Avenue	listing in Tempe Register pending	Ryden 1997
37	Pyle (Governor Howard J.) House, Park Tract Historic District	1938 Ranch-style residence, 1120 S. Ash Avenue	listed in Tempe Register	Ryden 1997
38	Tempe Municipal Building	1970 Modern commercial-style municipal building, 31 E. 5th Street	individually eligible, Criterion C	Ryden 1997
39	Tempe National Bank Building	1912 Egyptian Revival-style building, 526 S. Mill Avenue	listed in Tempe Register and Tempe Historic Landmark	Nucci 2006
Determined Eligible for National or Tempe Register				
40	Bauer House	1934 Southwestern-style residence, 599 W. 5th Street	eligible for Tempe Register	TCHPO 2013
41	Blakely House	1927 residence associated with Tempe's historic Section 16, 305 S. Roosevelt Street	eligible for Tempe Register	TCHPO 2013
42	Brown/Strong House	1883 Neocolonial/Georgian Revival-style residence, 604 Ash Avenue	individually eligible, Criterion C	Janus Associates 1983; Ryden 1997
43	Burket House	1945 Southwestern-style residence, 501 W. 5th Street	eligible for Tempe Register	TCHPO 2013
44	Cavalier Hills District	1960 residential subdivision bounded roughly by McKellips and Scottsdale roads, Weber Drive, and McAllister Avenue	eligible, Criteria A and C	Solliday 2001
45	Center for Family Studies, ASU District	1939 Art Moderne-style building, 851 S. Forest	individually eligible, Criteria A and C	Ryden 1997
46	Chavez House	1910 Sonoran-style residence, 927 S. Farmer Avenue	eligible for Tempe Register	TCHPO 2013
47	College View District	1946 to 1953 residential subdivision bounded roughly by Ash Avenue, Mill Avenue, 13th Street, and Hudson Lane	eligible, Criteria A and C	Solliday 2001

Table 4. Historic Buildings, Structures, and Districts within 1 to 2 Miles

	Site Name/Number	Description	National Register Status	Reference
48	Cummins House	1909 National Folk-style residence, 839 S. Farmer Avenue	eligible for Tempe Register	TCHPO 2013
49	Curry House	1927 residence associated with Tempe's historic Section 16, 225 S. Roosevelt Street	eligible for Tempe Register	TCHPO 2013
50	Diefenderfer House	1939 Bungalow-style residence, 1223 S. Farmer Avenue	eligible for Tempe Register	TCHPO 2013
51	Dines-Hight House	1889 Bungalow-style residence, 508 W. 5th Street	eligible for Tempe Register	TCHPO 2013
52	Gage Addition District, includes Nichols and Scudder house	1919 to 1954 residential subdivision roughly bounded by University Drive, 10th Street, railroad, and Mill Avenue	eligible, Criteria A and C	Ryden 1997
53	Gage (George) House, Gage Addition District	1888 Georgian Revival-style residence, 115 W. University Drive	individually eligible, Criterion B	Ryden 1997
54	Gammage (Dixie) Hall, ASU District	1941 Neoclassical-style building, 1001 S. Forest	individually eligible, Criteria A and C	Ryden 1997
55	Goodwin Homes District	1949 to 1959 residential subdivision roughly bounded by University Drive, alley north of 11th Street, Roosevelt, and Farmer	eligible, Criteria A and C	Ryden 1997; Solliday 2001
56	Guthrie House	1922 Bungalow-style farm house, 600 W.5th Street	eligible for Tempe Register	TCHPO 2013
57	Hotel Casa Loma	1899 Spanish Colonial-style building (originally Victorian style), 398 S. Mill Avenue	individually eligible	Janus Associates 1983; Ryden 1997
58	Irish Hall, ASU District	1940 Art Moderne-style building, 1250 S. College	individually eligible, Criteria A and C	Ryden 1997
59	Judd House	1915 National Folk-style farm house, 1208 S. Farmer Avenue	eligible for Tempe Register	TCHPO 2013
60	Lowenthal Rental, Park Tract District	1942 Norman Revival-style residence, 1029 S. Maple Street	individually eligible, Criterion C	Ryden 1997
61	Lyceum Theater, ASU District	1930 to 1940 Wrightian-style building, 901 S. Forest	individually eligible, Criteria A and C	Ryden 1997
62	Marriott House	1935 residence associated with Tempe's historic Section 16, 606 S. Roosevelt Street	eligible for Tempe Register	TCHPO 2013
63	Matthews Library, ASU District	1930 Neoclassical-style building, 950 S. College	individually eligible, Criterion C	Ryden 1997
64	Miller House	1941 Southwestern-style residence, 513 W. 5th Street	eligible for Tempe Register	TCHPO 2013
65	Minson House	1925 Bungalow-style residence, 1034 S. Mill Avenue	individually eligible, Criterion C	Ryden 1997
66	Moeur (Sidney B.) House, Gage Addition District	1921 Craftsman Bungalow-style residence, 903 S. Ash Avenue	individually eligible, Criterion C	Janus Associates 1983; Ryden 1997
67	Park Tract District, includes Baker and Nichols houses	1930 to 1960 subdivision roughly bounded by 10th and 13th streets, Mill Avenue, and railroad	eligible, Criteria A and C	Ryden 1997; Solliday 2001
68	Patio Palms	1960 multifamily residence, 626 S. Wilson Street	Tempe Register eligible	TCHPO 2013
69	Science/Agriculture Building, ASU District	1948 Art Moderne-style building, 250 E. Lemon	individually eligible, Criteria A and C	Ryden 1997
70	Spear House	1893 National Folk-style residence, 1015 S. Farmer Avenue	Tempe Register eligible	TCHPO 2013
71	Terrell House	1927 residence associated with Tempe's historic Section 16, 521 W. 5th Street	Tempe Register eligible	TCHPO 2013
72	West Hall, ASU District	1936 Neoclassical-style building, 1000 S. College	individually eligible, Criteria A and C	Ryden 1997
Tempe Register – Warrant Further Consideration				
73	Broadmor Manor District	1955 to 1960 subdivision bounded by Broadway Road, Alameda Drive, College Avenue, and Ventura Drive	potentially eligible, Criteria A and C	Solliday 2001

Table 4. Historic Buildings, Structures, and Districts within 1 to 2 Miles

	Site Name/Number	Description	National Register Status	Reference
74	Broadmor Vista District	1958 to 1960 subdivision bounded roughly by Broadway Road, and Broadmor, La Rosa and Ventura drives	potentially eligible, Criteria A and C	Solliday 2001
75	Campus Homes District	1952 to 1955 subdivision bounded roughly by Farmer Avenue, and Roosevelt, 13th and 17th streets	potentially eligible, Criteria A and C	Solliday 2001
76	Date Palm Manor District	1953 to 1959 subdivision bounded roughly by Broadway Road, Palmcroft Drive, railroad, and Mill Avenue	potentially eligible, Criteria A and C	Solliday 2001
77	Hughes Acres District	1954 to 1959 subdivision bounded roughly by Rural Road, Rita Lane, and Loma Vista and Broadmor drives	potentially eligible, Criteria A and C	Solliday 2001
78	Laird Estates District	1955 to 1959 subdivision bounded roughly by University Drive, and Wilson, 10th, and Roosevelt streets	potentially eligible, Criteria A and C	Solliday 2001
79	Mitchell's Subdivisions District	1950 to 1960 subdivision bounded roughly by University Drive, Farmer Avenue, and 10th and Roosevelt streets	potentially eligible, Criteria A and C	Solliday 2001
80	Nu-Vista District	1958 to 1960 subdivision bounded roughly by Mill Avenue and College avenues, Alameda Drive, and Southern Avenue	potentially eligible, Criteria A and C	Solliday 2001
81	Papago Parkway District	1954 to 1960 subdivision bounded roughly by Continental Drive, McAllister Avenue, and Campo and Papago drives	potentially eligible, Criteria A and C	Solliday 2001
82	Sunset Vista District	1958 to 1960 subdivision bounded roughly by Broadway Road, Broadmor Drive, Rural Road, and Granada Avenue	potentially eligible, Criteria A and C	Solliday 2001
83	Tempe Estates District	1958 to 1960 subdivision including Palmcroft Drive between Mill and College avenues	potentially eligible, Criteria A and C	Solliday 2001
84	Tempe Terrace District	1951 to 1960 subdivision bounded roughly by 10th Street, Farmer Avenue, and Howe, and Roosevelt streets	potentially eligible, Criteria A and C	Solliday 2001
85	University Estates District	1948 to 1960 subdivision bounded roughly by Mill and College avenues, railroad, and Broadway Road	potentially eligible, Criteria A and C	Solliday 2001
86	University Homes District	1951 to 1960 subdivision bounded roughly by Farmer Avenue, Roosevelt and 17th streets, and Broadway Road	potentially eligible, Criteria A and C	Solliday 2001
87	University Terrace District	1950 to 1955 subdivision bounded roughly by College Avenue, alley west of Ventura Drive, railroad, and Broadway Road	potentially eligible, Criteria A and C	Solliday 2001

NOTES: ASU = Arizona State University, National Register = National Register of Historic Places, TCHPO = Tempe City Historic Preservation Office, Tempe Register = Tempe Historic Property Register

One historic district and 30 individual properties are listed in the National Register. Eight additional individual properties are listed in the Tempe Register. Thirty-two other properties, including 5 districts and 28 individual buildings have been evaluated as eligible for the National Register or Tempe Register. The Tempe Historic Preservation Office also has sponsored studies of post-World War II subdivisions, which represent a period of rapid growth of the city, and 15 subdivisions have been identified as warranting further consideration for inclusion in the Tempe Register.

Review of Historic Maps and Aerial Photographs

The General Land Office conducted the first cadastral survey of Township 1 North, Range 4 East, where the power plant parcel is located, and the adjacent Township 1 North, Range 5 East in 1868. The resulting

plats were filed in 1870, the year the Phoenix townsite was designated and a year before Charles Hayden developed a ferry across the Salt River at the location that became Tempe. No cultural features were mapped in the project parcel (**Figure 5**), and only a few cultural features were mapped on the two plats. A short irrigation ditch was shown branching from the north side of the Salt River about 1.5 miles (2.4 km) northwest of the power plant parcel. A road was mapped heading west from the ditch, and a settler's cabin was mapped along the road about 2.25 miles (3.6 km) west of the irrigation ditch. The plat indicates the road passed the "ruins of an adobe house surrounded by a wall" about 0.5 mile (0.8 km) west of the cabin, and then connected with the road between Wickenburg and Fort McDowell about 0.25 mile (0.4 km) farther west. The ruins on the plat are the Hohokam platform mound and surrounding compound within what is now the Pueblo Grande Museum. The plat was annotated to show the Papago Saguaro National Monument established by proclamation on 31 January 1914 on the north side of the Salt River northwest of the project parcel. The national monument was abolished in 1930 and the land was transferred to the state.

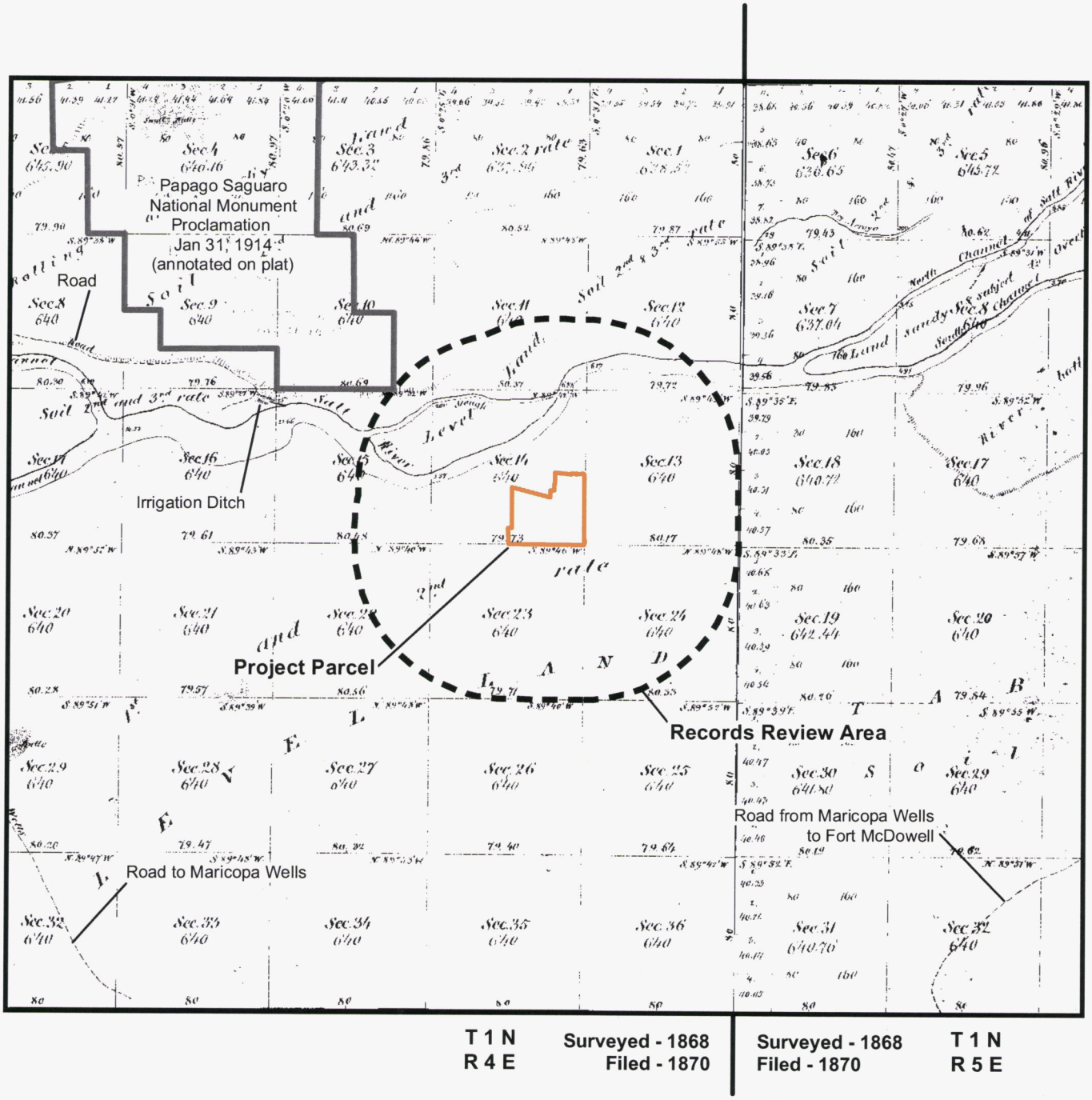
The plat of Township 1 North, Range 5 East mapped the road from Maricopa Wells to Fort McDowell passing within about 3.5 miles (5.6 km) to the southeast of the project parcel. The only other cultural features on the plat of that township were an unnamed road that crossed the eastern boundary of the township, another unnamed road that crossed the southern boundary, and an "old esca" that followed the edge of a river terrace in the northeast corner of the township. "Esca" appears to be a term used by General Land Office surveyors for what are now identified as long abandoned Hohokam canals.

The northwest part of Township 1 North, Range 5 East, north of the Salt River, was resurveyed in 1888, apparently because the area was within the designated Salt River Indian Reservation. The plat depicted a northeast-southwest trending irrigation ditch through what appear to be extensive fields in Sections 4, 5, 6, 7, and 8 of Township 1 North, Range 5 East. The plat also mapped 8 clusters of "huts," which must have been native homes, within and adjacent to the fields. Additional clusters of huts were mapped at 3 locations on a level mesa north of the fields, along with an "old trading store."

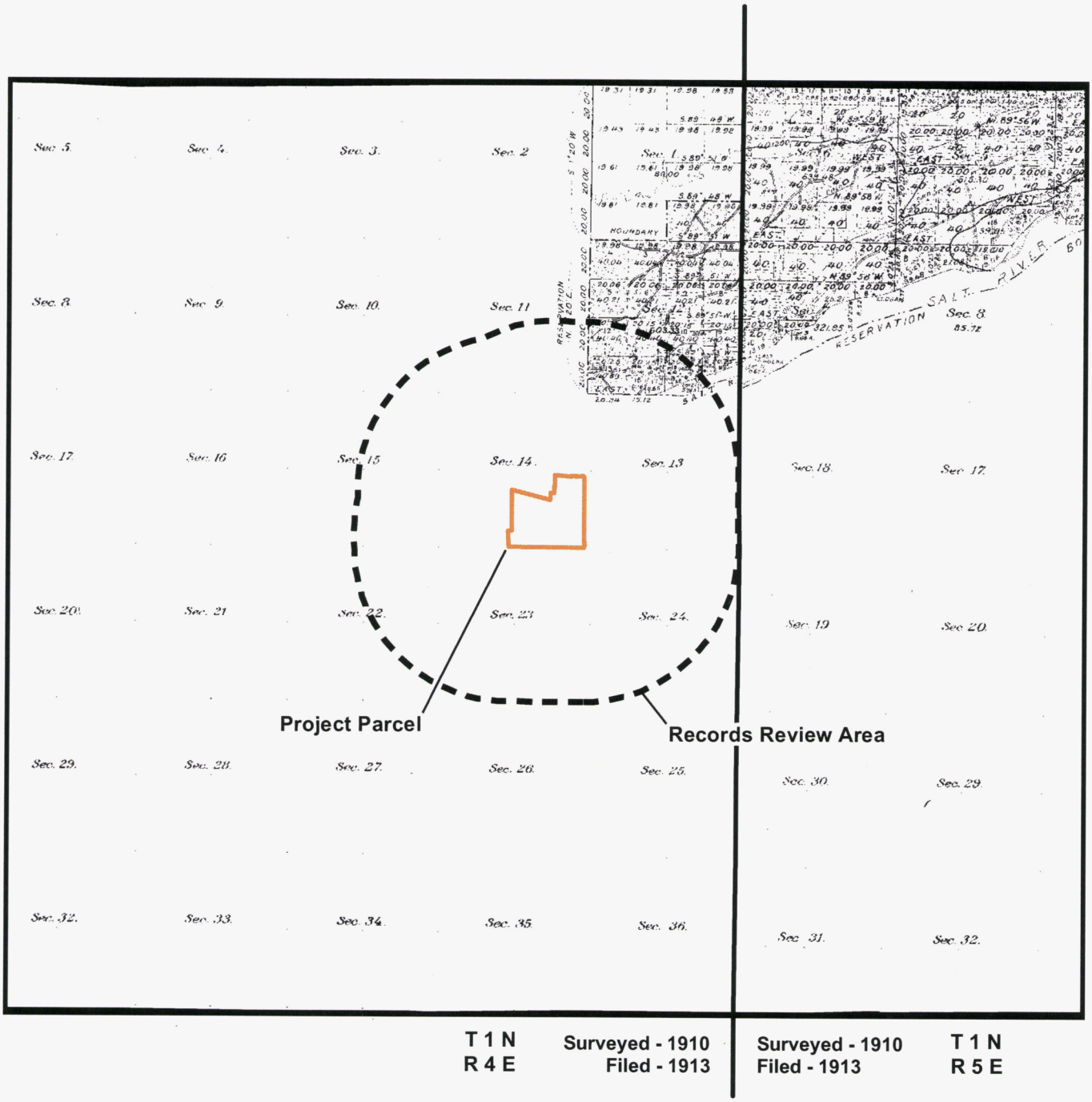
The northeast part of Township 1 North, Range 4 East and northwest part of Township 1 North, Range 5 East within the Salt River Indian Reservation were surveyed again in 1910. The resulting plats, which were filed in 1913, showed the irrigation ditch mapped in 1888 and depicted it extending into the southern half of Section 12 of Township 1 North, Range 4 East, as well as another approximately parallel ditch about 0.3 mile (0.5 km) to the north (**Figure 6**). The plat also shows several unnamed roads, numerous segments of fences within what appear to be fields, and ambiguous symbols that might represent two houses, but none of the clusters of huts mapped in 1888 were shown. A cemetery also was mapped in the NW1/4 SW1/4 of Section 6, Township 1 North, Range 5 East. All the features mapped by the resurveys, except for a few of the roads, fences, and probable fields in the southwest part of Section 12, Township 1 North, Range 4 East, are outside the records review area.

The Reclamation Service surveyed the Salt River Valley in 1902 and 1903 and the resulting topographic and irrigation map shows an irrigation lateral along the west side of the power plant parcel and another oriented east-west through the parcel, as well as two other short laterals along the south edge of the Salt River floodplain/sandy river bed, which angled across the northeastern part of the parcel (refer to Figure A-1). Those laterals branched from the Hayden Canal to the south, and suggest the area was being farmed. The Reclamation map indicated the Maricopa, Phoenix & Salt River Valley Railroad ran just south of the eastern part of the southern boundary of the power plant parcel.

A series of historic topographic maps and aerial photographs available on the Internet also were reviewed (http://www.historicaerials.com/). A 1915 topographic map identified the railroad just south of the power plant parcel as the Arizona Eastern Railroad and also showed a north-south wagon road along the approximate centerline of the section. At the center of the section, the road turned to the east along the northern boundary of the power plant parcel. A house was mapped just outside the power plant parcel along



1868 General Land Office
Cadastral Survey Plats
Figure 5



1910 General Land Office
Cadastral Survey Plats
Figure 6

the north-south road, just south of what is today University Drive near the intersection with Dorsey Lane. As shown on the earlier Reclamation Service map, the northern part of the parcel was mapped as being within the sandy floodplain of the Salt River.

The depictions of the power plant parcel were unchanged on 1938 and 1955 versions of topographic maps, but a 1957 topographic map indicated that the north-south road then terminated about 0.1 mile (0.2 km) north of the southern boundary of the section at what appears to be a farmstead with a house and two outbuildings. Two other houses were mapped on either side of the north-south road just north of the section line. A 1934 aerial photograph indicates that almost the entire power plant parcel was being farmed except for a strip in the southwest corner where the buildings shown on the 1957 quadrangle were located (Honker 2000). Even though those farmyards were not mapped on the 1938 and 1955 quadrangles, the photograph suggests they might already have been built by 1934, but the image is ambiguous. A 1954 aerial photograph indicates the power plant parcel continued to be farmed except for the strip in the southwest corner. A more detailed 1957 aerial photograph indicates the parcel continues to be farmed and there were at least two farmyards in the southwest corner, and perhaps another farmhouse hidden by trees. A 1970 aerial photograph indicates the power plant and substations had been constructed, but the fuel storage tanks were not yet in place and the northwestern part of the power plant parcel was still being farmed. The farmhouses and buildings in the southwest corner of the parcel had been removed.

In summary, the review of historic maps and aerial photographs indicate that remnants of historic irrigation laterals dating to the late nineteenth or early twentieth centuries might be present in the western, central, and northern parts of the power plant parcel. In addition, remnants of perhaps as many as three farmyards might be present in the southwestern corner of the parcel, but demolition of those farmyards and subsequent development of the Tempe/APS Joint Fire Training Center may have obliterated evidence of those farmyards. Most of the historic use of the power plant parcel was limited to farming. Because of the extensive ground disturbance associated with construction of the power plant and other facilities, the potential for intact archaeological features dating to the historic era appears to be low.

MONITORING GOALS AND METHODS

Geotechnical investigations at the Ocotillo Power Plant were archaeologically monitored as an initial investigation to determine whether modification of the power plant could affect significant archaeological and historical resources. It was recognized that the potential of the monitoring to detect archaeological resources was limited because the upper level of sediments within the power plant parcel had been highly disturbed by decades of farming and then construction of the power plant, which masked surface evidence of any archaeological resources that might be present.

The monitoring, however, did provide an opportunity to determine whether archaeological resources might be buried beneath the disturbed upper level. It was recognized that the sample provided by 21 borings would be extremely small, but sediments from the borings could yield information about the environment in which the sediments were deposited. It is very unlikely that archaeological resources would be preserved in deposits of sand, gravel, and cobbles that reflect high energy depositional environments. In contrast, archaeological resources could be preserved in finer silt and clay deposits that reflect low energy depositional environments. Research over the last couple of decades, for example, discovered deeply buried archaeological deposits without any surface indications of their presence on the floodplain of the Santa Cruz River in the Tucson Basin and provided significant information about pre-Hohokam occupation (Gregory 1999; Gregory and Mabry 1998; Gregory and others 2007; Mabry 1998; Mabry and others 1997; Thiel and Mabry 2006).

Prior to the excavation of each of the 21 borings, an archaeological monitor inspected an area about 130 feet (40 m) square centered on each boring location by walking transects no more than 65 feet (20 m)

wide. The sediments augured from each boring were inspected for artifacts and changes in color and texture that might indicate archaeological features. The sediments were not screened. Split barrel samples also were inspected but samples collected with closed barrels were not available for inspection.

The Ninyo & Moore (2013) geotechnical team prepared boring logs to document the sediments. URS reviewed those logs for information about the energy of the depositional environment and potential for preservation of archaeological resources.

MONITORING RESULTS

As anticipated, inspection of the boring locations determined that no natural ground surface remains intact. The extent of disturbance varied across the project area. Eight borings were excavated within spill containment pits around three large fuel storage tanks on the western part of the power plant parcel. The floors of those pits are approximately 6 feet (1.8 meters) below grade, and earthen berms around the perimeters of the pits are 3 to 4 feet (0.9 to 1.2 m) above grade. Much of the rest of the investigated area is covered with sorted gravel (**Photograph 5**). The installation of a network of buried electrical grounding cables and pipes and placement of fill dirt has altered much of the area. Boring B-21, for example, was stopped by what appears to be an abandoned concrete storm drain at a depth of about 4 feet (1.2 m).

Photograph 5. Gravel-Covered Ground Surface at Boring B-18 (view southeast)

The archaeological monitoring of the 21 borings did not identify any artifacts or evidence of archaeological features. Most of the deposits at the borings were characterized as loose to dense sand, sometimes well sorted and sometimes poorly sorted (**Table 5**). The borings could be considered to represent three north-south transects across the western part of the power plant parcel.

Table 5. Archaeologically Monitored Geotechnical Borings[1]

Boring	Depth	Sediments		Comments
B-1	21 feet (6.4 meters)	0-3.5 feet: 3.5-7.5 feet: 7.5-21 feet:	loose, silty sand medium dense, clayey sand very dense sand with gravel, cobbles, possible boulders	in tank spill containment pit (about 6 feet below grade)

Table 5. Archaeologically Monitored Geotechnical Borings[1]

Boring	Depth	Sediments		Comments
B-2	14.5 feet (4.4 meters)	0-3.5 feet: 3.5-12 feet: 12-14.5 feet:	medium dense, silty sand (trace of plastic debris) medium dense, poorly graded sand (trace of gravel) very dense, well-graded sand with gravel, cobbles, and possible boulders	in tank spill containment pit (about 6 feet below grade)
B-3	17 feet (5.2 meters)	0-7 feet: 7-17 feet:	loose, silty sand dense, well-graded sand with gravel, cobbles, and possible boulders	in tank spill containment pit (about 6 feet below grade)
B-4	13.7 feet (4.2 meters)	0-3.5 feet: 3.5-13.7 feet:	loose, silty sand loose, well-graded sand with gravel, cobbles, and possible boulders	in tank spill containment pit (about 6 feet below grade)
B-5	21 feet (6.4 meters)	0-6 feet: 6-8 feet: 8-21 feet:	loose, clayey sand with gravel hard, sandy clay very dense, well-graded sand with gravel	in tank spill containment pit (about 6 feet below grade) rare clay layer
B-6	18.2 feet (5.5 meters)	0-3 feet: 3-4.5 feet: 4.5-18.2 feet:	fill (medium dense well-graded sand with gravel) dense, silty sand dense, well-graded sand with gravel	in tank spill containment pit (about 6 feet below grade)
B-7	19 feet (5.8 meters)	0-3.5 feet: 3.5-13.5 feet: 13.5-19 feet:	fill (medium dense, silty sand with trace of gravel) medium dense, well-graded sand with aggregate medium dense gravel with sand, cobbles, and possible boulders	in tank spill containment pit (about 6 feet below grade)
B-8	17 feet (5.2 meters)	0-4 feet: 4-6 feet: 6-17 feet:	fill (medium dense, clayey sand) medium, dense, silty sand medium dense, well-graded sand with trace of gravel	in tank spill containment pit (about 6 feet below grade)
B-9	19.5 feet (5.9 meters)	0-2 feet: 2-7 feet: 7-12 feet: 12-19.5 feet:	fill (medium dense, clayey sand with gravel) stiff, sandy silt medium dense, poorly graded sand medium dense, well-graded sand with gravel	rare silt layer
B-10	18.5 feet (5.6 meters)	0-3 feet: 3-6.5 feet: 6.5-18.5 feet:	fill (loose, silty sand) loose, clayey sand loose, well-graded sand with trace of gravel	
B-11	22 feet (6.7 meters)	0-3.5 feet: 3.5-13.5 feet: 13.5-22 feet:	loose, silty sand medium dense, silty sand with gravel medium dense, well-graded sand with gravel	
B-12	22 feet (6.7 meters)	0-8.5 feet: 8.5-18.5 feet: 18.5-22 feet:	dense, silty sand with gravel medium dense, clayey sand, moderately cemented medium dense, poorly graded sand with trace of gravel	
B-13	22 feet (6.7 meters)	0-3.5 feet: 3.5-6 feet: 6-8.5 feet: 8.5-22 feet:	fill (medium dense, clayey gravel) medium dense, clayey sand with gravel loose, sandy silt medium dense, well-graded sand with gravel	rare silt layer
B-14	18 feet (5.5 meters)	0-3.5 feet: 3.5-11.5 feet: 11.5-14 feet: 14-18 feet:	fill (medium dense, clayey sand with gravel) loose, silty sand with gravel medium dense, poorly graded gravel medium dense, well-graded sand with gravel	
B-15	20 feet (6.1 meters)	0-3.5 feet: 3.5-6 feet: 6-13.5 feet: 13.5-20 feet:	fill (medium dense, clayey sand with gravel) stiff, sandy silt medium dense, well-graded sand with gravel medium dense, well-graded sand with subrounded gravel	rare silt layer
B-16	12 feet (3.7 meters)	0-5.5 feet: 5.5-9.5 feet: 9.5-12 feet:	loose, poorly graded sand medium dense, silty sand medium dense, silty gravel, cobbles, and possible boulders	
B-17	22 feet (6.7 meters)	0-10 feet: 10-22 feet:	vacuumed around buried utilities; no samples medium dense, silty, poorly graded sand with gravel	
B-18	16 feet (4.9 meters)	0-13.5 feet: 13.5-16 feet:	fill (very stiff, sandy clay) dense, well-graded sand with gravel	rare clay layer but fill material

Table 5. Archaeologically Monitored Geotechnical Borings[1]

Boring	Depth	Sediments		Comments
B-19	17 feet (5.2 meters)	0-6 feet: 6-8.5 feet: 8.5-17 feet:	fill (loose, silty sand with trace of gravel) loose, silty sand medium dense, well-graded sand with gravel	
B-20	18 feet (5.5 meters)	0-10 feet: 10-18 feet:	vacuumed around buried utilities; no samples dense, silty, well-graded sand with gravel	
B-21	4 feet (1.2 meters)	0-4 feet:	fill (loose, silty sand with gravel)	two attempts 5 feet apart stopped by abandoned storm drain

NOTES: [1] abstracted from Ninyo & Moore (2013)
m = meters

From north to south, the western transect includes borings B-4, B-1, B-5, B-6, B-2, B-7, B-8, and B-3, all of which were within the spill containment pits around the fuel storage tanks and began approximately 6 feet (1.8 m) below the natural grade. Those borings reached depths ranging from about 14 to 21 feet (4.3 to 6.4 m) where they were typically stopped after being driven into about 10 feet (3 m) of dense sand with gravel and usually cobbles and possibly boulders. The higher deposits were more variable ranging from medium dense well-graded to poorly graded sand and loose silty sand to dense clayey sand. The only deposit finer than sand was 2 feet (0.6 m) of hard sandy clay at a depth of 6 to 8 feet in boring B-5. The upper 3 to 4 feet (0.9 to 1.2 m) of deposits in borings B-6, B-7, and B-8 were classified as fill and ranged from clayey sand, to silty sand with a trace of gravel, to well-graded sand with gravel. The upper 3.5 feet (1.1 m) of boring B-2 was silty sand with a trace of plastic and also might be fill material.

From north to south, the central transect includes borings B-10, B-16, B-11, B-12, B-13, B-14, B-15, B-9, and B-18. (Boring B-9 is somewhat closer to the western transect but is included in the central transect because it is outside the spill containment pits.) The depths of those borings ranged from 12 to 22 feet, where they were typically stopped by sand deposits with gravel but not cobbles and possible boulders. Because this transect of borings began approximately 6 feet (1.8 m) higher and closer to the natural grade than the western transect, the deeper deposits of cobbles with possible boulders that typically terminated the borings in the western transect were not usually reached. The exception was the shallowest boring (B-16), where a layer of gravel with cobbles and possible boulders was encountered. The higher deposits were variable, ranging from loose to dense silty sand to loose to medium dense and moderately cemented clayey sand. The only deposits finer than sand included a layer of sandy silt at a depth of 6 to 8.5 feet (1.6 to 2.6 m) in boring B-13, 3.5 to 6 feet (1.1 to 1.8 m) in boring B-15, and 2 to 7 feet (0.6 to 2.1 m) in boring B-9. A layer of very stiff sandy clay also was found in boring B-18 from the surface to a depth of 13.5 feet (4.1 m) but was classified as fill material. The upper 3 to 3.5 feet (0.8 to 1.1 m) of borings B-13, B-14, and B-15 also were identified as fill material, which ranged from silty sand to clayey sand with gravel to clayey gravel.

From north to south, the eastern transect includes borings B-19, B-20, B-17 and B-21. Boring B-21 was stopped at a depth of 4 feet (1.2 m) when an apparent abandoned concrete storm drain was encountered after penetrating fill consisting of silty sand with gravel. The other three holes reached depths of 17 to 22 feet (5.2 to 6.7 m) into well-graded sand or silty sand with gravel. To prevent damage to nearby buried utilities the upper 10 feet (3 m) of deposits in borings B-17 and B-20 were vacuumed and no information was collected. The upper 6 feet (1.8 m) of boring B-19 also was identified as fill consisting of loose silty sand with a trace of gravel. Overall, the eastern transect yielded little information about natural deposits but in general they seem to be sands similar to the majority of deposits found in the central and western transects.

In general, the deposits documented in the borings are quite variable as might be expected on the floodplain of a braided, meandering river channel. Most of the deposits are sands, which indicate a relatively high energy depositional environment that would not be conducive to preservation of archaeological deposits. A

few lenses of finer silt and clay were detected that would have more potential for intact archaeological deposits. The chronology of the deposits has not been established other than a general late Pleistocene age for the Lehi terrace (Wellendorf and others 1986). Silt deposits were found in borings B-13 and B-15 at depth of 3.5 to 8.5 feet (1.1 to 2.6 m) that might be of an age that could include pre-Hohokam and Hohokam deposits. The clay deposit detected at a depth of 6 to 8 feet (1.8 to 2.4 m) in boring B-5 in a sediment containment pit are likely to be closer to 12 to 14 feet (3.7 to 4.3 m) below the natural grade and probably predate any evidence of human occupation of the region.

Artifacts evidencing Hohokam use of the area were identified at several locations on the surface of the ground. The first artifacts were noted while accessing boring B-8, the first to be excavated. The artifacts were found on the berm of the spill containment pit and eroding off the berm. Further inspection found artifacts at several other locations on the berms (**Figure A-2**). Artifacts also were noted on the floors of the southern and northern spill containment pits, probably because they had been incorporated in fill deposits. Two additional potsherds were found at Boring B-15 east of the spill containment pits, where the upper deposits were identified as fill, which might have derived from the excavation of the spill containment pits. All artifacts appear to be in disturbed contexts, and not in deposits in which they were originally discarded.

The artifacts include primarily potsherds, with some flaked stone, one piece of ground stone, and possibly a few pieces of faunal bone, although the bone might be natural rather than a cultural deposit. The ceramics include Hohokam plain ware, red ware, and buff ware sherds. None of the buff ware sherds had temporally diagnostic painted designs, but the red ware suggests a Classic period date. The artifacts were not inventoried, but it estimated that more than 100 and fewer than 500 artifacts were noted.

The number and location of the artifacts suggests that construction of the three large fuel storage tanks along the western side of the power plant parcel and excavation of the spill containment pits around them disturbed archaeological deposits within a Hohokam field—perhaps a seasonal field house site associated with the nearby large Hohokam village site of La Plaza. Such sites could have remnants of canals, ephemeral field houses, and various types of pits. Three burials were found at field house site AZ U:9:281(ASM) indicating that human remains can be associated with field houses, but they are much more common in village sites. The intensive, long-term evidence of habitation at the La Plaza site is limited to the higher Mesa terrace and it is unlikely that the disturbed archeological deposits in the power plant parcel on the lower Lehi terrace were part of a Hohokam village.

CONCLUSION AND RECOMMENDATIONS

A records review documented that the prehistoric Hohokam farmed in the vicinity of the power plant parcel and occupied a large village site known as La Plaza for several centuries (from the Pioneer to the Classic periods, circa A.D. 500 to 1400) southwest of the parcel. The village site is on the Mesa terrace, which is a higher landform than the Lehi terrace on which the power plant parcel is located. Prior archaeological investigations have found only evidence of farming and seasonal field houses on the lower Lehi terrace.

The archaeological monitoring found a few hundred Hohokam artifacts on the surface of the ground in highly disturbed contexts, suggesting that the construction activities on the power plant parcel probably disturbed archaeological deposits within a Hohokam field area—perhaps a field house site that might have had evidence of temporary shelters, canals, and various types of pits. Human burials usually are associated with village sites, but three burials were found at a field house site excavated south of the La Plaza site indicating that burials also can be associated with field house sites. The archaeological monitoring identified no evidence that any burials had been disturbed by construction activities within the power plant parcel.

The sediments documented in the geotechnical borings are varied as expected in a floodplain adjacent to a dynamic braided and migrating river channel. The deposits are primarily sands that reflect a relatively high

energy depositional environment that is not conducive to the preservation of archaeological deposits. However, pockets of finer sediment reflecting gentler, overbank flood deposits that are conducive to preserving archaeological deposits might remain intact, as identified by prior archaeological excavations at the margins of the La Plaza site about 0.5 mile (0.8 km) west of the power plant parcel.

Ideally, archaeological testing could be conducted to further explore whether intact archaeological deposits might remain buried in the power plant parcel, but the extent of infrastructure within the parcel greatly limits the potential to undertake archaeological testing safely. We recommend that APS consider whether some archaeological testing might be conducted to expose vertical profiles of sediments, which could be analyzed to better understand the nature and age of the deposits and better gauge whether significant archaeological deposits might remain intact within the parcel.

Documentation of the structure and texture of the exposed deposits would provide more information about the geomorphology of the sediments, particularly with regard to whether the energy of the depositional environment would have been conducive to preservation of archaeological deposits. If charred materials are exposed, they could be collected and radiocarbon dated to better understand the chronology of the deposits. If appropriate contexts are identified, sediment samples could be collected and analyzed to extract pollen and biosilicates that might provide information about the local environment and how it changed over time and whether the Hohokam used the area for farming and what crops they might have grown.

Smoothing vertical faces on the side walls of the spill containment pits around the three large fuel storage tanks in the western part of the power plant parcel might be an alternative to excavating new test trenches. Archaeological monitoring of the removal of obsolete facilities or construction of new facilities also might provide additional opportunities to determine whether significant archaeological deposits are buried within the power plant parcel.

In summary, field observations made during archaeological monitoring of the geotechnical borings documented that prehistoric Hohokam artifacts were present in the power plant parcel but were in contexts disturbed by construction activities. It is recommended that APS consider opportunities for additional archaeological testing or monitoring to further investigate whether any buried archaeological deposits might remain intact. If intact archaeological deposits were found, it is recommended that they be evaluated and treated in accordance with any applicable local government, state, or federal regulations.

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The restricted distribution maps in this appendix have been removed from this copy of the report.

APPENDIX– RESTRICTED DISTRIBUTION MAPS

A-1 Previously Recorded Archaeological Sites
A-2 Monitoring Results

ATTACHMENT E-2 – STATE OF ARIZONA – HISTORIC PROPERTY INVENTORY FORM

STATE OF ARIZONA – HISTORIC PROPERTY INVENTORY FORM

PROPERTY IDENTIFICATION

Inventory No: OPP-1

Name: Ocotillo Power Plant District **Survey Area:** Ocotillo Power Plant parcel

Address: 1500 E. University Drive **City:** Tempe **County:** Maricopa

Quarter Section: SE1/4 **Section:** 14 **Township:** 1N **Range**: 4E **USGS 7.5-minute quadrangle:** Tempe

Plats: N/A

Architect: EBASCO Services / Marley Co. / H.H. Green

Builder: Arizona Public Service / Homes & Sons

Construction Date: 1958-1960

Number of Resources: 13 (Steam Unit 1, Steam Unit 2, station building with turbines and generators, a service building/maintenance shop designed by architect H.H. Green, a large prefabricated steel and wood equipment warehouse, two smaller sheds of similar construction, two cooling towers, a steel water storage tank, a steel fuel storage tank, a 230-kilovolt (kV) switchyard, and a 69-kV switchyard, plus others that are less than 50 years old)

STRUCTURAL CONDITION

[X] Good [ ] Fair [ ] Poor

USES/FUNCTIONS

Historic Use: INDUSTRY/energy facility
Building Type: natural gas power plant
Present Use: INDUSTRY/energy facility

PHOTOGRAPH INFORMATION

Subject: steam turbine boilers **Date:** 11 October 2013 **View:** northeast **Photograph No.**: 2856

SIGNIFICANCE

See continuation sheets.

INTEGRITY

Location: [X] Original Site [ ] Moved

Design: The cooling towers were rebuilt in 2012; mechanical upgrades have been made, including a transition from pneumatic controls to a computerized system. Additional buildings and structures have been constructed within the power plant.

Setting: The Ocotillo Power Plant is within an urban area in the Tempe city limits. The surrounding area includes commercial properties, apartment buildings, Arizona State University's Karsten Golf Course, the Salt River (Tempe Town Lake), and the Loop 202 freeway.

In the late 1950s, the study area was outside the Tempe city limits and the project parcel and adjacent parcels were agricultural fields. There was some light industrial development to the south along University Drive and the area further south had been developed with residential subdivisions.

Materials: See continuation sheets.

Workmanship: See continuation sheets.

NATIONAL REGISTER STATUS

☐ Individually listed ☐ Contributor ☐ Non-contributor to_____ Historic District

Date Listed:_____ ☐ Determined eligible by keeper of National Register date:_____

RECOMMENDATIONS OF ELIGIBILITY

Property ☐ is ☒ is not eligible individually

Property ☐ is ☒ is not eligible as a contributor to a potential historic district.

☐ More information needed to evaluate

If not considered eligible, state reason: insufficient significance

Form Completed By

Name and Affiliation: Kirsten Johnson, URS Corporation
Date: 28 October 2013
Mailing Address: 7720 N. 16th Street, Suite 100, Phoenix, Arizona 85020
Phone Number: (602) 371-1100

SIGNIFICANCE

History

Arizona Public Service Company (APS) purchased a parcel of land bounded by the Salt River to the north, University Drive to the south, Rural Road to the west, and McClintock Drive to the east to develop the Ocotillo Power Plant. APS developed only a portion of this parcel, roughly bounded by Rio Salado Parkway and University Drive to the north and south, and Dorsey Lane and McClintock Drive to the west and east, and later sold the remaining property. Construction of the Ocotillo Power Plant on that parcel of land began in 1958 and was completed in 1960.

The history of the Arizona Public Service Company (APS) began in 1886 when the Phoenix City Council granted a gas and electric franchise to Japanese immigrant Hutchion Ohnick (Hachiro Onuki). In 1920, the Central Arizona Light and Power Company (CALAPCO) took over Ohnick's Phoenix Illuminating Gas and Electric Company, which had been renamed the Pacific Gas and Electric Company in 1906. Four years later, CALAPCO became part of the American Power and Light System, a holding company that provided the funding to modernize CALAPCO's utility facilities. During the 1920s, CALAPCO's service area expanded to the surrounding communities of Buckeye, Chandler, Gilbert, and Tempe, and in the 1930s to Peoria, Scottsdale, and Glendale (Reilly 1970).

By the end of the 1920s, more power was needed to supply the Phoenix metropolitan area, and in 1930 construction of the 18,000-kilowatt (18 megawatt) Phoenix Power Plant was completed at 4606 W. Hadley Street. (The capacity of the plant was subsequently expanded to 1,000 megawatts and is now known as the West Phoenix Power Plant.) After World War II, commercial and technological development in the Phoenix metropolitan area boomed. Residential subdivisions were constructed and suburbs expanded in response to the rapidly increasing population. The dramatic post-war development resulted in the need for expanded utility services (Reilly 1970).

In 1945, the American Power and Light System sold its stock holdings in CALAPCO and CALAPCO became a publicly owned company. Four years later, CALAPCO acquired the Northern Arizona Light and Power Company, which provided power to most of Yavapai, Coconino, Navajo, and Gila counties. That acquisition more than doubled CALAPCO's service area. In 1951, CALAPCO merged with Arizona Edison, which had formed in the 1920s when several small utilities in southern and central Arizona communities combined. After that merger, the company became known as APS and served approximately 200,000 customers in a 37,000 square-mile area across ten counties (APS 1961a; Reilly 1970).

In 1952, APS began a long-range construction program to bolster their generation capacity, which included the construction of three new natural gas-fired power plants. The first of these was the Saguaro Power Plant in the vicinity of Red Rock in southern Pinal County. The Saguaro plant was constructed to supplement hydroelectric power provided by the Parker and Davis dams to the southern Arizona mining communities of Douglas and Bisbee and to provide power to the San Manuel Mine, which purchased much of the electricity produced by the power plant. Construction of the Saguaro Power Plant began in 1952 and the first 100-megawatt steam turbine went into service on 1 July 1954. Construction of a second 100-megawatt steam turbine began in 1954 and it went into service in June 1955. The power plant was completed at a cost of more than $25 million and in late 1955 the plant was producing more electric energy than the entire state had used in 1942. In 1955, the Arizona Power Authority entered into a contract with APS to purchase up to 30 megawatts of electricity per year (APS 1951, 1953, 1954, 1955; Biegler 1980; Reilly 1970).

In 1956, APS entered into an agreement with California Electric Power Company for the joint construction of a 160-megawatt generating station near Yuma and began planning a 220-megawatt steam electric generating plant in Tempe. APS would call the Yuma facility the Yucca Power Plant and

the Tempe facility the Ocotillo Power Plant to continue the desert flora theme initiated with the Saguaro Power Plant. Construction of the Yucca Power Plant began in 1957 and was completed in 1959 (APS 1956, 1957, 1959, 1960).

Construction of the Ocotillo Power Plant began in March 1958 (Scottsdale Progress 1958). The 1958 APS annual report estimated the total construction costs for the plant would be about $30 million. By the end of 1958, construction of the plant was 15 percent complete and the total costs for the year were around $7 million. The natural gas power plant, which could also operate with fuel oil, was to include two twin steam units with 15-story steam boilers, turbines, and generators; cooling towers; and service and warehouse buildings. At the time it was constructed, the Ocotillo facility had a generating capacity of 220 megawatts and was the largest electric generating plant in Arizona. In 1959, Elmer O. Dowies, who had been an employee of APS since 1949 and the superintendent at the Saguaro Power Plant since 1953, was appointed superintendent of the new Ocotillo Power Plant and charged with the organization and training of the staff to operate the plant. In September 1958, a 370-man crew was at work constructing the Ocotillo facility and the first steam turbine unit was expected to go into service in March 1960 (APS 1958, 1959; Arizona Republic 1959;).

All three of APS's new natural gas-powered plants were designed with 3 major cost-saving features. One was a centralized control room where the pneumatic controls of many of the plant functions could be operated, which reduced the number of employees required to operate the plant around-the-clock from 76 to about 42. The open-air design of the facilities that was used for the boilers in all three of the APS natural gas-fired power plants also saved on construction costs. Open-air construction was a relatively new design that was feasible because of southern Arizona's mild climate. Historically, boilers, turbines, and generators had been housed inside masonry buildings that were more expensive to construct. APS was one of the first utility companies to use an open-air design when the company constructed the partially outdoor West Phoenix Power Plant in 1930. The other cost-saving feature of the power plants was the location of machinery maintenance shops on site, which allowed the company to fabricate and repair damaged parts more efficiently (APS 1959).

Construction of the Ocotillo Power Plant was completed in 1960 for a total cost of $26 million. Between 1940 and 1960, the number of customers served by APS tripled and the 220-megawatt Ocotillo Power Plant increased the company's total generating capacity to 625 megawatts, which was 223 percent more than in 1950 (APS 1960; Arizona Republic 1960a). In 1960, APS celebrated its 75th Anniversary, and 1 year later the company initiated another long-range construction program that included construction of new coal-fired power plants. The increasing cost of natural gas coupled with the continuing increases in energy demand led APS to concentrate their research and development activities on coal. APS's first coal-fired plant, the Cholla Power Plant, began operations in 1962 in northern Arizona between the communities of Joseph City and Holbrook. APS' second coal-fired plant, the Four Corners Power Plant, opened in 1963 in northwestern New Mexico (APS 1960, 1961b; 1963, 1966; Reilly 1970).

Architecture (Plant Description)

The Ocotillo Power Plant was constructed between 1958 and 1960 at 1500 E. University Drive in Tempe with two twin steam units, a station building, a service building/machinery maintenance shop, two cooling towers, a prefabricated steel and wood equipment warehouse, 2 smaller sheds of similar construction, a steel water storage tank, 69-kV and 230kV switchyards, and a steel fuel tank south of the turbines (Figure 1). To ensure that a ready supply of natural gas was available, the power plant was built next to a buried El Pas Natural Gas pipeline that had been installed in the 1930s. A railroad spur built to deliver materials and equipment during construction of the plant was later used to deliver supplemental fuel oil for operating the plant. The spur branched from the Southern Pacific Railroad and was abandoned after the Union Pacific Railroad acquired the Southern Pacific Railroad in 1996, and backup fuel is now delivered by truck.

The original 1960s power plant facilities, with the exception of the railroad spur and some small ancillary buildings, remain extant. EBASCO Services, a New York engineering consulting and construction firm, designed the twin steel boilers, which are within 178-foot-tall, open-air, structural steel frameworks supported by reinforced concrete foundations. The boilers are Combustion Engineering Type R steam generators. A 2-story concrete masonry unit station building, which houses the control room, is adjacent to the east side of the boiler structures. Twin Westinghouse generators, each with a capacity to produce 110 megawatts, are installed on the roof of the station building. The steam units have been updated as technologies evolved, but most of the original materials remain and the overall appearance is unchanged. Older technologies that are no longer used are still in place adjacent to their modern counterparts, including the original General Electric control panel in the central control room, which is opposite a bank of modern computers that are now used to operate the power plant. Pneumatic tubes that once were used to operate the plant are still in place on the steel framework of the steam boiler structures adjacent to modern cable trays. An illuminated 175-foot-long APS sign with 8-foot-tall Plexiglas letters was once mounted on the east side of the steel boiler structures, and when lit could be seen for several miles (Arizona Republic 1960b). APS stopped lighting the sign in 1973 after President Richard Nixon implemented energy conservation measures to offset effects of an energy crisis resulting from an embargo by Arab oil producers. The sign was later removed and donated to the Tempe Historical Museum (personal communication, Randy Clawson, Arizona Public Service, 11 October 2013).

The two cooling towers are southwest of the boilers. Water from the boilers is transported to the cooling towers through a buried reinforced concrete pipe that is 6 feet in diameter. Three deep wells provide cooling water for the plant equipment and condensate for the boilers. When running at full capacity, the Ocotillo Power Plant uses about 300,000 gallons of water daily, most of which is consumed by evaporation from the cooling towers (APS 2013). The Marley Company manufactured the cooling towers, which consist of concrete basins approximately 52 feet wide, 198 feet long, and 6 feet deep, that support double flow louvered cooling towers approximately 65 feet wide and 35 feet high with seven 22-foot-diameter air fans mounted in 14-foot-tall cylinders on a deck atop each cooling tower (Marley Company 1958). Metal stairs on the short ends of the towers were used to access the fan decks. The long sides of the cooling towers had corrugated asbestos cement louvers. Both cooling towers were rebuilt in 2012 with a design that mimics the old and the exterior appearance of the towers is mostly unchanged (personal communication, Randy Clawson, Arizona Public Service, 11 October 2013).

The service building/machine shop is south of the boilers. Noted local architect H.H. (Herbert Harmon) Green designed the building with elements of the International style, and Homes & Son Construction Company constructed the building. The L-shaped, one-story building faces south, and the east/west oriented section of the building houses administrative offices, meeting rooms, and a cafeteria. The north/south section of the building is a machine shop. The building is constructed of concrete block with a pre-cast concrete double-tee roof system. The roof is flat and built-up. The service section of the building is about 11 feet tall and the machine shop is 16 feet tall to accommodate vehicles and other machinery.

The building was designed in a simple modernistic style with most of the architectural detailing around the front entry, which is on the southeast corner of the building. The double-entry storefront doors face east and there is a plate glass sidelight to the north. The south-facing wall outside the doors is faced with ceramic tile that continues into the interior lobby. The entrance is shaded by the overhanging roof and an 8-foot-tall convex concrete wall faced with stone veneer encloses the entryway on the east side. Other exterior ornamentation is limited to 4 pierced concrete block panels on the front of the building. An APS sign on the front of the building is not original. The north side of the service section of the building is accessed through four single-entry doors. The east and west sides of the machine shop each have a single entry door and a steel roll-up door and there is one steel roll-up door on the north side.

Most of the original steel casement windows appear to have been replaced and some of the window openings have been modified.

Architect H.H. Green began his professional career in Chicago, where he designed both residential and commercial buildings. He arrived in Phoenix in the 1920s and became well-known for his designs of Period Revival residential properties in the Phoenix Country Club and other affluent residential neighborhoods in the city. In the 1930s, Green's work began to move away from regional period-revival styles to modernism, both in residential and commercial designs. After World War II, Green focused his work on public and commercial buildings and continued his stylistic shift to mid-twentieth century modern architecture, using design elements of the International style. Examples of his later work include Phoenix College buildings, several Valley National Bank branches, the Arizona Power Authority and Registrar of Contractors (now Vital Records) buildings, and the Phoenix Public Library (Weisiger and Ryden 1982; Zacharias 2008).

A large prefabricated steel and wood equipment warehouse, which was part of the original power plant construction, is west of the service building/machine shop. The 1-story shed has a front gable roof clad with composition roll. Its primary entrance is on the north side and consists of double sliding doors. Two smaller sheds of similar construction and a steel water tank are immediately west of the boilers and a small discharge pond is northwest of the boilers. The fuel tank south of the boilers that was part of the original plant construction once stored diesel fuel, which was used in testing and as an additional backup fuel. Two switchyards (69kV and 230kV) were built east of the steam units.

Between 1972 and 1973, APS built two combustion turbines west of the boilers, which increased the capacity of the plant to 330 megawatts, and another smaller fuel tank was added south of the service building/machine shop in the 1970s. In 1975, 3 large fuel tanks were built along the western edge of the power plant parcel to store No. 6 Residual Fuel Oil that was used to supplement natural gas at the Ocotillo Power Plant until the mid-1980s or early 1990s. Diesel fuel also was used for testing and as another backup fuel until about 2000. Today, the power plant is fueled exclusively by natural gas and the fuel tanks are no longer used (personal communication, Randy Clawson, Arizona Public Service, 11 October 2013).

In 1988, APS installed the Solar Test and Research (STAR) Center south of the service building/machine shop. A remnant of the facility continues to generate commercial power. The Tempe/APS Joint Fire Training Center was constructed in 1993 in the southwest corner of the power plant parcel. The Butte 69kV Substation, which provides electric power to Arizona State University and west Tempe, also is in that corner of the parcel. Immediately north of the boilers is an APS construction yard with a few buildings and a paved parking and storage lot. The yard is separated from the power plant by a chain-link fence.

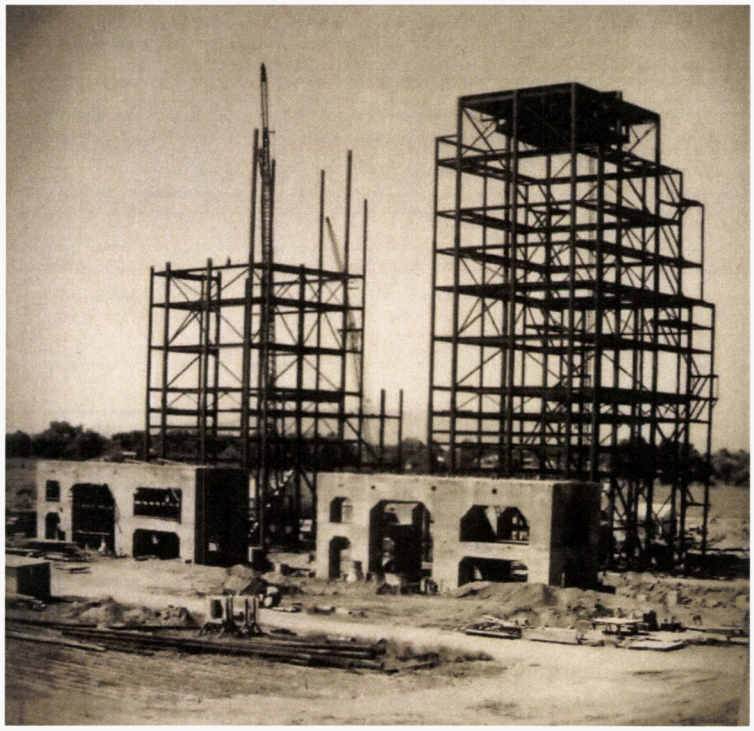
Evaluation

The Ocotillo Power Plant was one of three natural gas power plants constructed by APS between 1952 and 1960 as part of a post-World War II long-range construction program, which was implemented in response to the rapid population growth and development in Arizona. The Ocotillo Plant was the last of the three to be completed, but was also the largest. At the time of its construction, the Ocotillo Power Plant was the largest electric generating plant in Arizona but was eclipsed as larger power plants were developed. The power plant is representative of a local power company's response to the increased power needs during a time of monumental change in the demography and economy of the state. The facilities within the power plant are, however, largely utilitarian machines that have been upgraded as technology evolved. The Ocotillo Power Plant is associated with post-World War II growth—an important theme in the Arizona history—but the plant lacks sufficient significance to be considered eligible for the Arizona Register of Historic Places (Arizona Register) under Criterion A.

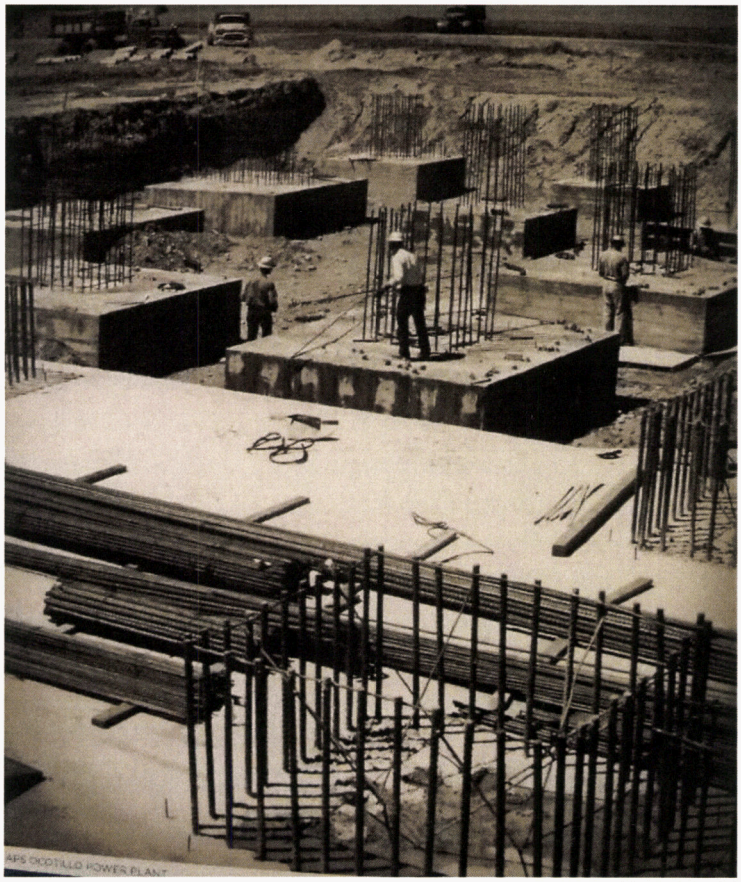
The open-air, structural steel design of the boiler structures represents a design adapted to local environmental conditions that APS used for the Saguaro and Yucca power plants that also were constructed as part of the company's post-World War II long-range construction plan. Although APS was one of the first utility companies to construct generating structures with an open-air design, this type of utilitarian construction was commonly used after World War II, and the Salt River Project also constructed similar generating units at their Kyrene Generating Station, which was built somewhat earlier between 1951 and 1954 (Caraco 1954; Salt River Project 2013). Most of the other original buildings and structures within the power plant are storage and maintenance buildings or support facilities for the main power plant operations and are of a common design. Therefore the power plant is not eligible for the Arizona Register under Criterion C.

The service building/machine shop, which has elements of the International style, was designed by noted local architect H.H. Green. When the Ocotillo Power Plant was constructed, it was a large expenditure for APS and a symbol of the company's commitment to provide power to the rapidly increasing population in the Phoenix metropolitan area. It is probably for this reason that the company commissioned an architect to design a service building that was likely to be seen by the public. The Ocotillo Power Plant service building/machine shop is a fairly utilitarian building. Its minimalist design features—the front entry and the pierced concrete block panels—are limited to the front of the building, which is in the public eye. The only major alteration to the building appears to be the replacement of its original steel casement windows and its overall integrity is good. If the power plant as a whole were to be considered an eligible district, the service building/machine shop would be considered a contributor. Because the power plant is not recommended eligible as district, the individual eligibility of the building was considered because it was designed by a local master architect. The building is an unexceptional example of Green's work and other architecturally significant buildings designed by Green in the same era are still extant in the Phoenix metropolitan area and in other parts of the state. Therefore it is recommended that the building be considered not individually eligible under Criterion C.

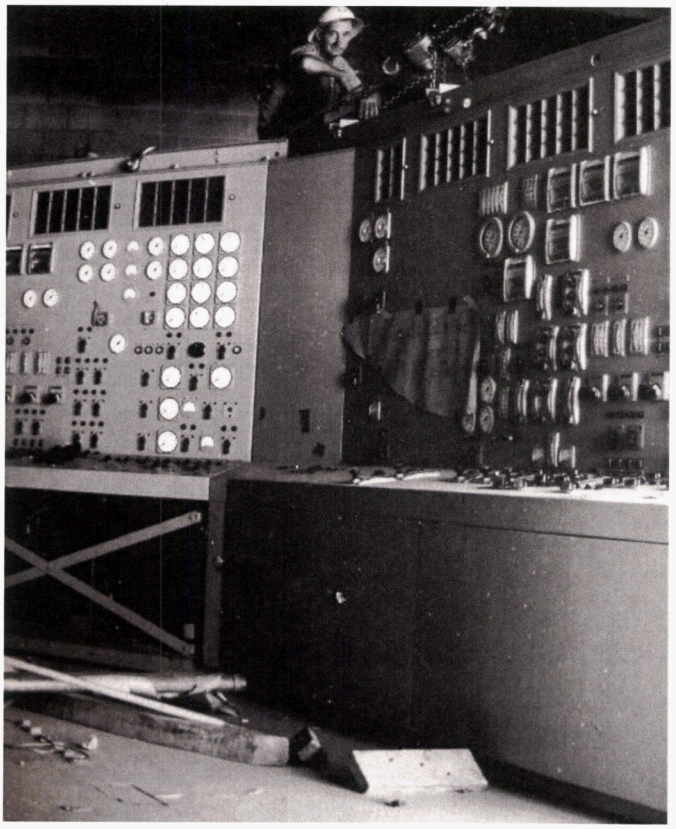
The power plant also is not eligible under Criterion B or D because research did not identify any associations with historically significant persons and additional research is unlikely to yield important information.



Ocotillo Power Plant Steam Boiler Structures and Station Building under Construction in August 1958 (photograph courtesy of APS)



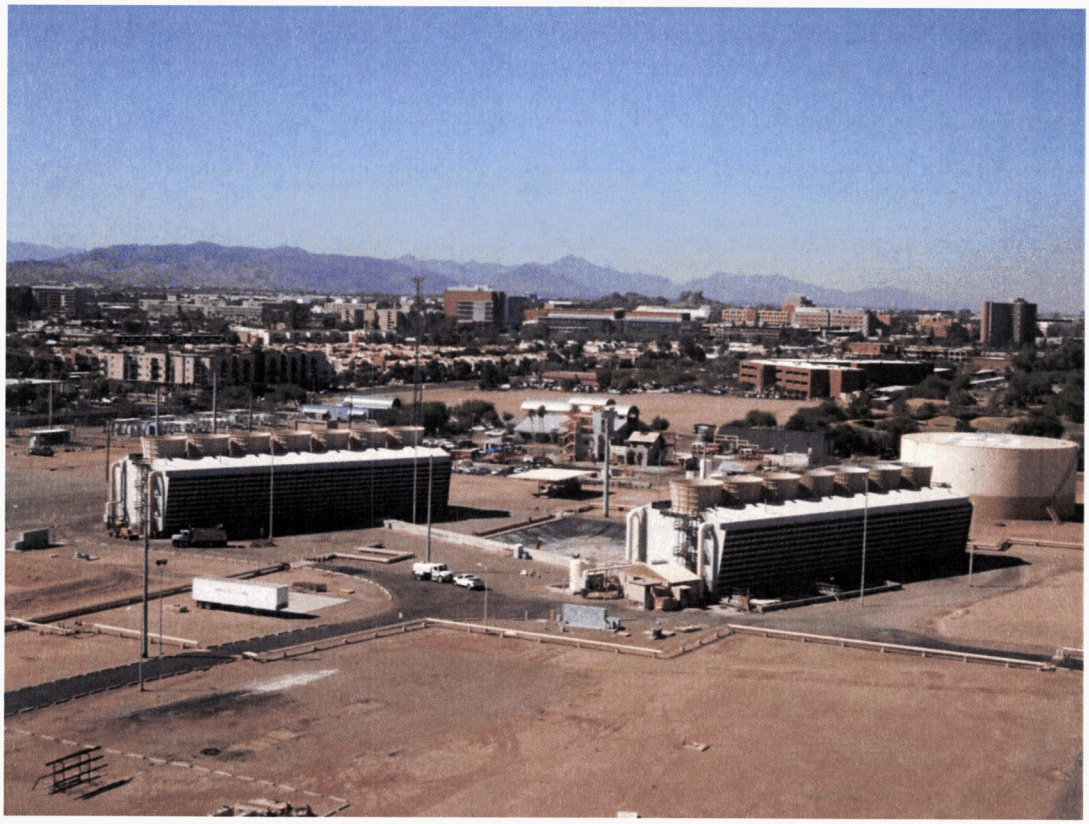
Ocotillo Power Plant Concrete Foundations under Construction in August 1958 (photograph courtesy of APS)



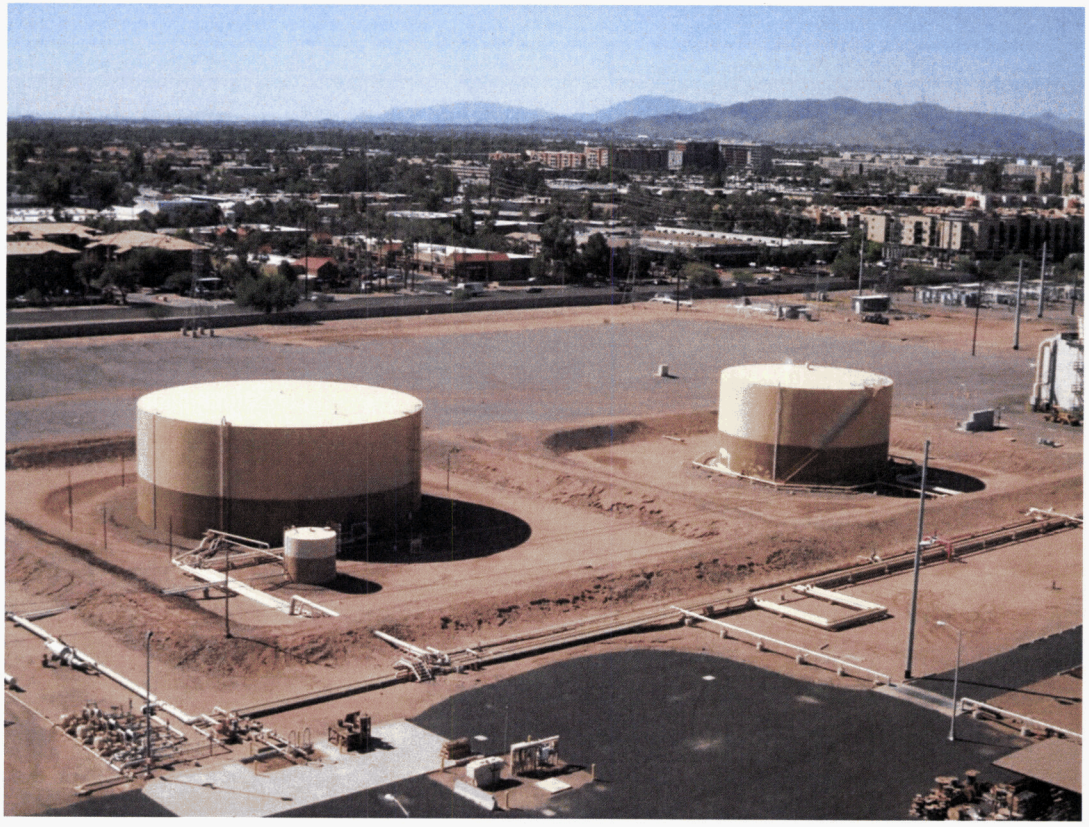
Ocotillo Power Plant Control Panel under Construction (photograph courtesy of APS)

Installation of Buried 6-Foot Diameter Concrete Water Pipe between Steam Units and Cooling Towers (photograph courtesy of APS)

Ocotillo Power Plant Steam Units 1 and 2 with Station Building (view southwest)



Ocotillo Power Plant Rebuilt Cooling Towers (view southwest)

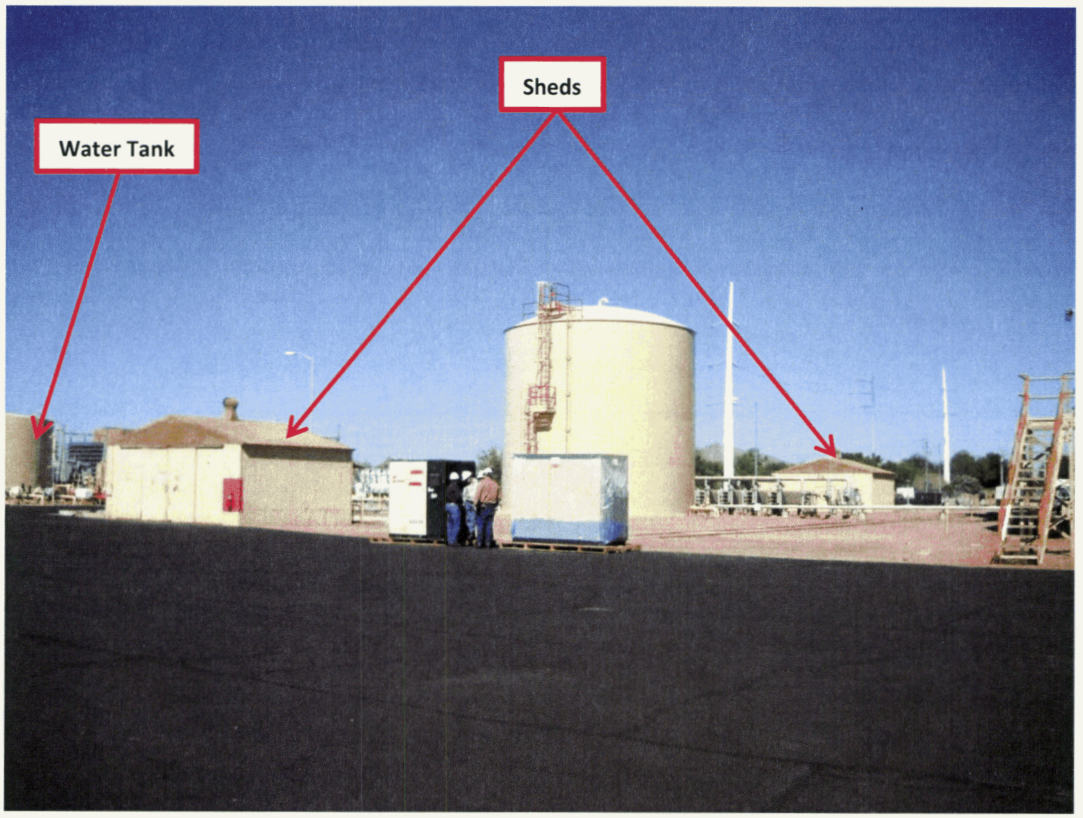


Ocotillo Power Plant Fuel Tanks South of the Steam Units 1 and 2 (view southwest)

Ocotillo Power Plant Service Building/Machine Shop (steam units are in the background in this view to the north)

Ocotillo Power Plant Service Building/Machine Shop (view northwest)

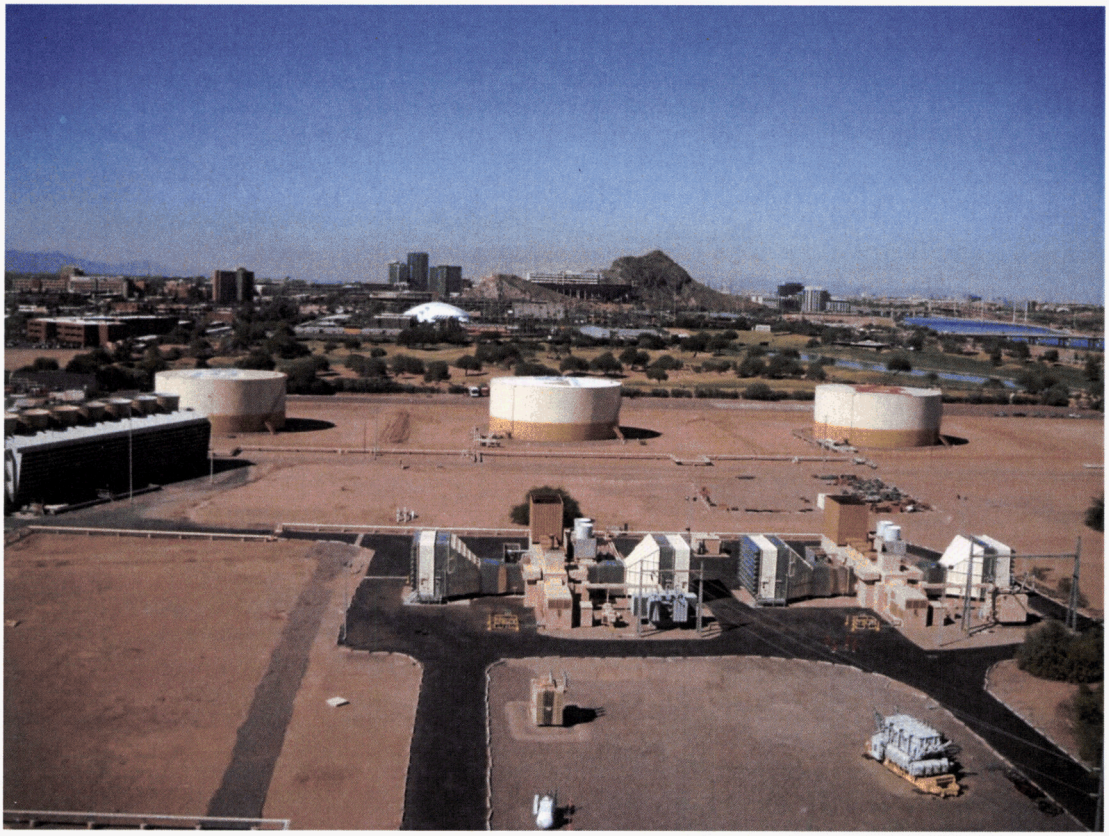
Ocotillo Power Plant Equipment Warehouse (view southwest)



Ocotillo Power Plant 1960 Sheds and Water Tank (view north-northwest)

Ocotillo Power Plant Control Panel

Ocotillo Power Plant Westinghouse Generator on Station Building Roof (view south)



1972-1973 Combustion Turbines with 1975 Fuel Tanks in Background at Ocotillo Power Plant (view west)

APS Construction Yard and Adjacent 230-Kilovolt Switchyard (view north)

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ATTACHMENT E-3 – ARCHAEOLOGICAL TESTING AT THE APS OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

ARCHAEOLOGICAL TESTING AT THE APS OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

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URS Cultural Resource Report 2014-4(AZ)

Restrict Distribution

To avoid vandalism, restrict information in this report about the location of archaeological sites, as provided for by Section 304 of the National Historic Preservation Act, Section 9(a) of the Archaeological Resources Protection Act, and Section 39-125 of the Arizona Revised Statutes.

Disclaimer

In preparing this report, URS Corporation used background information that was compiled by prior studies in the project vicinity. URS Corporation relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

April 2014

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ACRONYMS AND ABBREVIATIONS

APE	area of potential effects
APS	Arizona Public Service
Arizona Register	Arizona Register of Historic Places
cm	centimeter
km	kilometer
m	meter
National Register	National Register of Historic Places
URS	URS Corporation

ABSTRACT

Agencies: Arizona Corporation Commission

Report Title and Date: *Archaeological Testing at the APS Ocotillo Power Plant, Tempe, Maricopa County, Arizona.* April 2014

Permits: none required

Project Numbers: URS Job 23446558

Project Description: The Arizona Public Service Company (APS) began constructing the Ocotillo Power Plant in the late 1950s, and currently operates the two 110-megawatt gas-fired steam units that were put into service in 1960 as well as two 55-megawatt combustion turbines that were added to the plant in 1972 and 1973. APS proposes to modernize the power plant by decommissioning the two aging 110-megawatt units and replacing them with five new 102-megawatt combustion turbines powered by natural gas. APS cannot implement the plan unless the Arizona Corporation Commission issues a Certificate of Environmental Compatibility. The application for a certificate requires APS to address potential impacts of the proposed project on historic sites and structures and archaeological sites. APS retained URS Corporation (URS) to conduct cultural resource studies to support the permit application.

URS staff previously completed and reported (1) a cultural resource literature review and a check of records of prior studies and archaeological and historical resources recorded near the Ocotillo Power Plant, (2) an evaluation of the historic significance of the power plant, and (3) archaeological monitoring of geotechnical investigations within the power plant parcel. The monitoring identified no evidence of buried artifacts or archaeological features but in accessing the geotechnical boring locations, the archaeological monitors found many Hohokam artifacts on the berms of the retention basin around the three large fuel storage tanks on the western part of the power plant parcel. Based on those findings and the results of the records and literature review, it was hypothesized that construction of the three large fuel storage tanks had disturbed one or more Hohokam field houses or an activity area within a Hohokam field that probably had been farmed by the residents of a nearby Hohokam village site known as La Plaza. There were no regulatory requirements for APS to consider impacts on cultural resources when the power plant and fuel storage tanks were constructed.

APS authorized URS to conduct archaeological testing to determine whether buried archaeological deposits might remain intact in areas that could be disturbed by the proposed modernization of the power plant. This report documents that testing as well as field inventory of a large sample of the surface artifacts in the project area.

Location: The APS Ocotillo power plant is at 1500 East University Drive in north Tempe on the south side of the Salt River within the Phoenix Basin. The parcel is in the SE1/4 of Section 14, Township 1 North, Range 4 East, Gila and Salt River Meridian, which is mapped on the Tempe, Arizona, U.S. Geological Survey 7.5-minute topographic quadrangle.

Scope of Project and Jurisdiction: APS owns the power plant parcel, which covers about 126 acres (51 hectares), but facilities other than the Ocotillo Power Plant are located on the parcel, including an APS

maintenance yard, electrical substations, and the Tempe/APS Joint Fire Training Center. The area of potential effects (APE) for direct construction impacts of potential modifications of the power plant encompasses about 15.8 acres (6.4 hectares) in the northwestern part of the parcel. A total of 13 test trenches, accumulating to 1,390 feet (424 meters [m]), were excavated. One 50-foot (15-m) trench was excavated to a depth of 7 feet (2.1 m) and the rest were dug to depths of 4 to 5 feet (1.2 to 1.5 m). The extent of testing constitutes about a 0.6 percent sample of the APE, but more than 1 percent of the APE that has not been highly disturbed by excavation of the fuel tanks retention basin and other power plant infrastructure.

Personnel and Dates of Fieldwork:

APS archaeologist Jon Shumaker was the APS representative for the project and APS archaeologist Chris Watkins assisted him. URS archaeologist Chad Kirvan led the URS archaeological crew, which included Ronald Savage and Regina Chapin-Pyritz. Bruce Phillips of EcoPlan Associates was the project geoarchaeologist. Dr. A.E. (Gene) Rogge served as principal investigator. A total of 36 person-days were devoted to the archaeological fieldwork between 4 November and 12 December 2013. Because the testing was on privately owned land, no permits other than APS' authorization were required.

Arizona Register-Eligible Properties:

1 site, AZ U:9:311(ASM)

Arizona Register-Ineligible Properties:

none

Conclusion and Recommendations:

Temporally diagnostic potsherds among the 2,082 artifacts that were field inventoried indicate the Hohokam probably farmed on the Lehi terrace (geologic floodplain) within the power plant parcel between the Gila Butte phase of the early Colonial period and the late Classic period Civano phase (circa A.D. 750 to 1450). As expected, the testing revealed that construction of the power plant, decades of earlier farming, and flood flows on the floodplain had disturbed much of the project area but the discovery of buried strata with archaeological deposits and an irrigation canal feature at depths of about 3 to 5 feet (1 to 1.5 m) in the northwest corner of the power plant parcel indicate that the archaeological record of the project area remains at least partially intact. Those strata thin to the east or are deeper than the 5-foot (1.5-m) deep test trenches. Because the canal appears to date to the final Civano phase of the Hohokam occupation there is potential that earlier Hohokam or perhaps even pre-Hohokam deposits might be more deeply buried in parts of the project area.

Testing east of the fuel tank retention basin failed to find any archaeological features or many artifacts, suggesting that excavation of the retention basin may have removed most of the intact archaeological deposits and any archaeological features that were present. The testing also indicated that 2.3 feet (0.7 m) or more of sediments have been deposited across the area by flood flows after the Hohokam occupation ended about 5 centuries ago. The one trench that was dug deeper revealed an erosion channel that extended to a depth of about 7 feet (2.1 m) and was underlain by an eroded paleosol of undetermined age. Although the lateral extent of the erosion channel was not determined it could be extensive and the few artifacts found in trenches east of the retention basin appear to be in eroded contexts.

An archaeological site, designated AZ U:9:311(ASM), was defined to encompass the extensive scatter of disturbed artifacts and the one buried canal feature that was found. Because the extent of test excavation was limited and too shallow in most areas to test for potential archaeological deposits below 5 feet (1.5 m), the site boundaries are somewhat arbitrary and are likely to warrant modification as more is learned about the site. Because the canal is buried, horizontal exposure has potential to identify a network of field ditches, which have been documented only rarely at other sites. Accordingly, it is recommended that site AZ U:9:311(ASM) be considered eligible for the Arizona Register of Historic Places under Criterion D for its potential to yield important information.

Because the canal and adjacent field areas are buried in the very northwestern corner of the power plant parcel, it might be possible to design the proposed new facilities to avoid disturbance of the area. If not, it is recommended that a plan be developed and implemented to recover information and artifacts from the area prior to any construction activity.

Deeper testing is needed to further evaluate whether intact archaeological features and deposits might be present in areas beyond the northwestern corner of the power plant parcel below the depths of the test trenches that were excavated. The safety requirements for stepping back or shoring trenches deeper than 5 feet (1.5 m) make such testing complicated and costly. The proposed modernization of the power plant will involve deep excavations for new combustion turbine foundations. If the construction schedule could be designed to dig the required deeper excavations early in the process and accommodate archaeological monitoring and time to excavate any archaeological features that might be discovered, that could be an effective strategy for checking for deeper archaeological deposits. Such a strategy entails the risk of construction delays if archaeological excavations to recover and preserve artifacts and information take more time than allocated.

An alternative would be to excavate more test trenches during continued design of the new facilities and preconstruction planning, targeting the testing in those areas that would be disturbed by deep excavations for turbine foundations. It should be recognized that more preconstruction testing may not eliminate a need for archaeological monitoring of construction activities unless the results indicate there is little potential for human remains to be buried in areas that would be disturbed by construction of the proposed new facilities. Even if more preconstruction testing does not eliminate the need for archaeological monitoring of construction to ensure that human remains are treated in accordance with the Arizona Burial Law, additional testing should provide information about the extent of disturbed deposits and what areas would not warrant monitoring.

ARCHAEOLOGICAL TESTING AT THE APS OCOTILLO POWER PLANT, TEMPE, MARICOPA COUNTY, ARIZONA

INTRODUCTION

The Arizona Public Service Company (APS) began constructing the Ocotillo Power Plant in the late 1950s, and currently operates the two 110-megawatt gas-fired steam units that were put into service in 1960 as well as two 55-megawatt combustion turbines that were added to the plant in 1972 and 1973. APS proposes to modernize the power plant by decommissioning the two aging 110-megawatt units and replacing them with five new 102-megawatt combustion turbines powered by natural gas. APS cannot implement the plan unless the Arizona Corporation Commission issues a Certificate of Environmental Compatibility. The application for a certificate requires APS to address potential impacts of the proposed project on historic sites and structures and archaeological sites. APS retained URS Corporation (URS) to conduct cultural resource studies to support the permit application.

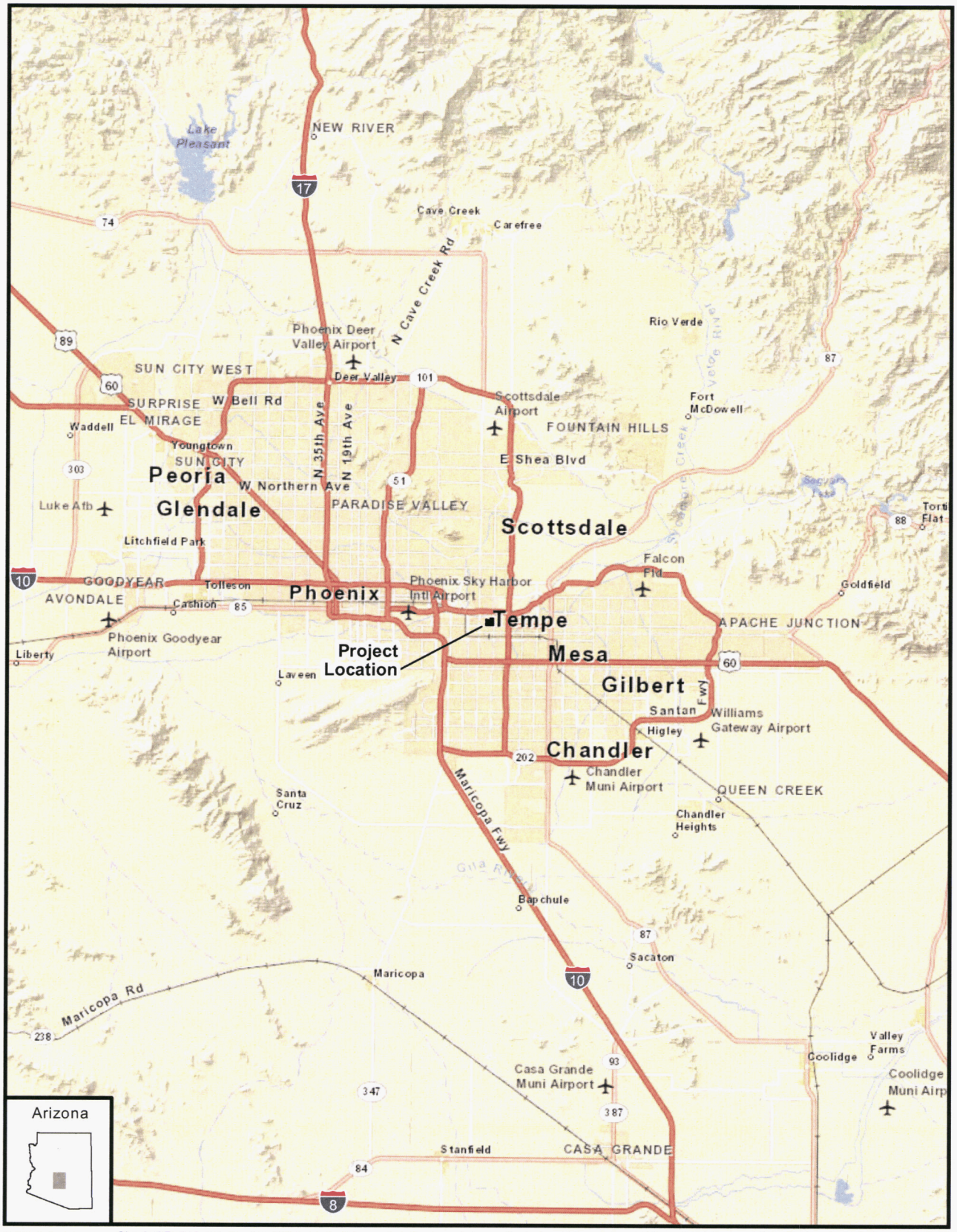
Project Location and Area of Potential Effects

The APS Ocotillo Power Plant is in the Phoenix Basin on the south side of the Salt River (**Figure 1**) at 1500 East University Drive in north Tempe (**Figure 2**). The power plant is on a parcel of land owned by APS, covering about 126 acres (51 hectares) in the SE1/4 of Section 14, Township 1 North, Range 4 East, Gila and Salt River Meridian. The area is mapped on the Tempe, Arizona, U.S. Geological Survey 7.5-minute topographic quadrangle (appended **Figure A-1**).

Facilities on the parcel, other than the power plant, include electrical substations, an APS maintenance yard, and the Tempe/APS Joint Fire Training Center. The area of potential effects (APE) for direct construction impacts of the proposed power plant modernization includes 15.8 acres (6.4 hectares), mostly in the western part of the parcel where three large fuel storage tanks would be removed and the five new turbines would be built (**Figure 3**). Another 10.4 acres (4.2 hectares) would be used for temporary construction offices, materials laydown, and vehicle parking. That area has been disturbed and those uses are unlikely to have any potential to disturb any intact archaeological resources that might be buried in that area. An internal access road would be built from the main power plant entrance road to the new generating units and construction of the road could disturb buried archaeological resources, depending on the depth of subgrade preparation. Ground disturbance associated with removal of the two steam units and two associated cooling towers would be confined to areas that were disturbed when those facilities were built.

Prior Studies

URS staff previously completed a cultural resource literature review and a check of records of prior studies within an area that included the power plant parcel and a surrounding area 1 mile (1.6 kilometers [km]) wide (Rogge and Kirvan 2013). The review documented that archaeological research in the Salt River Valley began in the 1880s, and although the early investigations were intermittent, they provided valuable information about prehistoric sites and irrigation canal systems before they were masked by agricultural development and subsequent urbanization. The review identified 65 modern cultural resource studies conducted since the late 1950s within the records review area. Only four of those studies were within the power plant parcel itself, and together they covered less than 2 acres (0.8 hectare) that had been highly disturbed by development (Florie 2010; Howard 2001; North 2002; Solometo 2000). None of those surveys discovered any archaeological or historical sites, but other studies had recorded 15 archaeological sites and 24 historic districts, buildings, and structures within the records review area. The review identified 87 more historic districts, buildings, and structures, which have been listed in or determined eligible for the Arizona Register of Historic Places (Arizona Register), the National Register of Historic Places (National Register), or the Tempe Historic Property Register, between 1 to 2 miles (1.6 to 3.2 km) of the power plant parcel.



Base map sources: Shaded Relief. Arizona Land Resource Information System, Arizona State Land Department, Phoenix, Arizona. 2010 Electronic Data Purchase. Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community. Use authorized by Esri license.

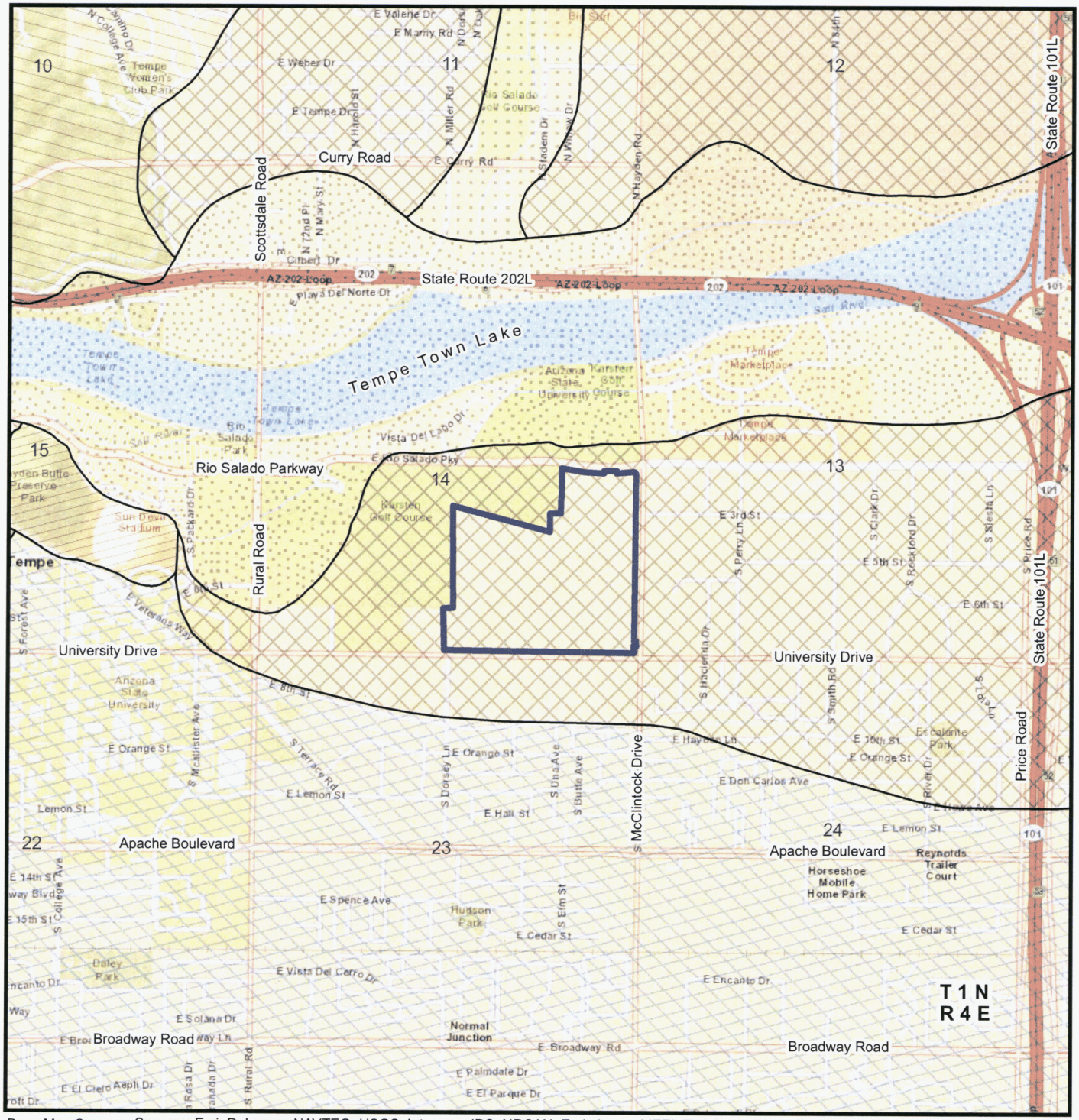
0 5 10 Miles

0 5 10 15 Kilometers

N

■ Project Location

General Project Location
Figure 1



Base Map Source: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri, Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012. Use authorized with Esri license.
Landform Source: Wellendorf and Others 1986

Landform

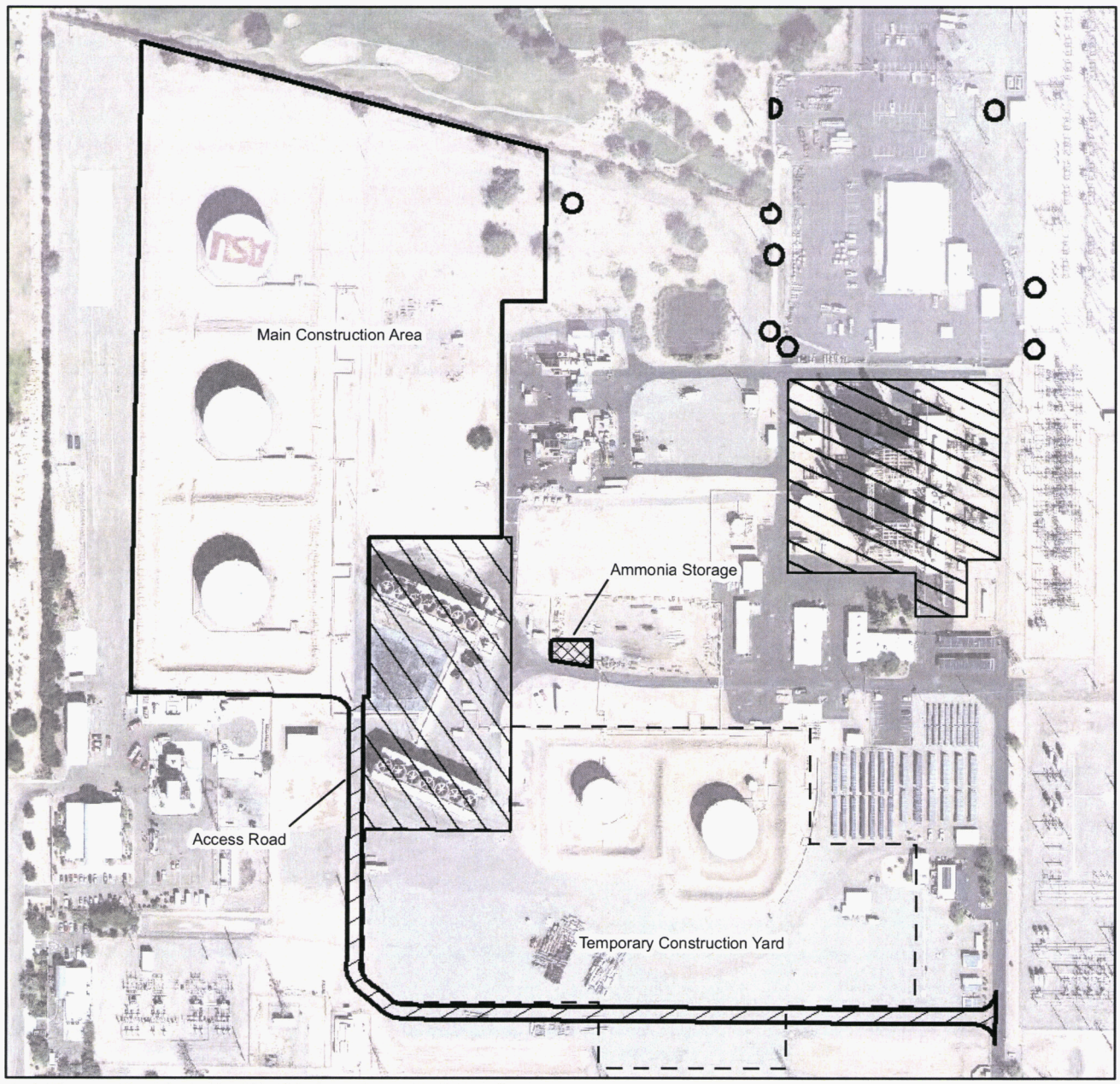
- Floodplain of Indian Bend Wash
- Active Geologic Floodplain of the Salt River
- Tempe Butte Bedrock Highlands and Colluvial Slopes
- Lehi Terrace
- Mesa Terrace
- Eroded Papago Buttes Pediment

Legend

- Power Plant Parcel

0 1,000 2,000 3,000 Feet
0 250 500 750 1,000 Meters
N

Ocotillo Power Plant Parcel
Figure 2



Aerial Source: Flood Control District of Maricopa County 2012, Data Purchase

0 100 200 300 Feet

0 25 50 75 100 Meters

N

Legend

- Main Construction Area
- Access Road
- Ammonia Storage
- Transmission Line Structure Location
- Cooling Towers Removal Area (demolition in previously disturbed area)
- Steam Turbine Generating Units Removal Area (demolition in previously disturbed area)
- Temporary Construction Yard (no potential to affect archaeological resources)

Area of Potential Effects for Direct Construction Impacts
Figure 3

Because components of the power plant are more than 50 years old and their historical significance had not been previously evaluated, they were inventoried and researched. The evaluation concluded they lack historical significance worthy of preservation, and it was recommended that they be considered ineligible for the Arizona Register or National Register, which have identical eligibility criteria (Johnson 2013).

Many of the archaeological sites recorded in the review area are within a large prehistoric Hohokam village site known as La Plaza, which is located at the base of Tempe Butte southwest of the power plant (refer to Figure A-1). The Hohokam occupied that village from the Pioneer period through the Classic period (circa A.D. 450 to 1450), and built a network of irrigation canals to farm the surrounding land. The village was situated on the Mesa terrace, which is about 10 to 15 feet (3.0 to 4.5 meters [m]) above the bed of the Salt River. The adjacent, lower Lehi terrace is only about 5 feet (1.5 m) above the riverbed, and represents the geologic floodplain (Wellendorf and others 1986). The Ocotillo Power Plant parcel is on the lower Lehi terrace (refer to Figure 2).

Although most of the irrigated Hohokam fields near La Plaza were on the higher Mesa terrace above the floodplain, archaeological investigations conducted about 0.5 mile (0.8 km) west of the power plant parcel documented that the Hohokam also farmed on the floodplain (Lehi terrace). Three studies documented that during the early twentieth century the meandering channel of the Salt River scoured away part of the Lehi terrace east of Tempe Butte but the scouring did not extend east as far as the power plant parcel (Rockhill and Rice 2010; Steinbach and Watkins 2008a, 2008b). Another investigation overlapped the scoured river channel and the Lehi terrace and found a canal, a field house, a hearth, and two pits on parts of the terrace that had not been eroded, and documented that the Hohokam grew maize on the floodplain (Rice and others 2011). Another recent archaeological excavation overlapped the boundary between the Lehi terrace and the higher Mesa terrace and found more evidence of Hohokam farming on the Lehi terrace, as well as remnants of pit houses, middens, hearths and cooking pits, other pits, and numerous human burials of the La Plaza village but evidence of the village was confined to the Mesa terrace (Rice 2013).

In June and July 2013, URS staff archaeologically monitored 21 geotechnical borings within the Ocotillo Power Plant parcel as an initial check for unrecorded archaeological resources within the project area. Most borings, which were 8 inches (20 centimeters [cm]) in diameter, reached depths of 12 to 22 feet (3.7 to 6.7 m) before they were halted by deposits of sand, gravel, cobbles, and possible boulders. One boring penetrated to a depth of only 4 feet (1.2 m) because it was stopped by a buried concrete object (possibly an abandoned storm drain). No buried artifacts or archaeological features were detected, but the area exposed accumulated to less than 8 square feet (0.7 square m). In accessing the boring locations, however, the archaeological monitors found many Hohokam artifacts around the retention basin surrounding the three large fuel storage tanks on the western part of the power plant parcel. The only other artifacts noted were two potsherds found on the surface of fill dirt that had been previously placed near Boring B-15 about 165 feet (50 m) east of the retention basin. The archaeological monitors estimated that there were approximately 100 to 500 artifacts (mostly potsherds) on the ground surface (Rogge and Kirvan 2013). Based on those findings and the results of the records and literature review, it was hypothesized that construction of the three large fuel storage tanks had disturbed one or more Hohokam field houses or an activity area within a Hohokam field that probably had been farmed by the occupants of the nearby La Plaza village site. There were no regulatory requirements for APS to consider impacts on cultural resources when the power plant and fuel storage tanks were constructed.

APS authorized archaeological testing to determine whether buried archaeological deposits might remain intact in areas that could be disturbed by the proposed modernization of the power plant. This report documents that testing. The previously prepared report (Rogge and Kirvan 2013) discusses regulatory requirements, the environmental and cultural history context of the project area, and the results of the records and literature review and can be consulted for that information, which is not repeated in this report.

Personnel and Permits

APS archaeologist Jon Shumaker was the APS representative for the project and APS archaeologist Chris Watkins assisted him. URS archaeologist Chad Kirvan led the URS archaeological crew, which included Ronald Savage and Regina Chapin-Pyritz. Bruce Phillips of EcoPlan Associates was the project geoarchaeologist. Dr. A.E. (Gene) Rogge served as principal investigator. A total of 36 person-days were devoted to the archaeological fieldwork between 4 November and 12 December 2013. Because the testing was on privately owned land, no permits other than APS' authorization were required.

INVENTORY OF SURFACE ARTIFACTS

The artifacts that had been noted during the archaeological monitoring of geotechnical investigations apparently were dug up when the retention basin was excavated to a depth of about 5 feet (1.5 m) around the fuel tanks (**Photograph 1**). The artifacts are most dense on earthen berms surrounding the basin, and apparently were concentrated as a lag deposit as the berms eroded. Because of the extent of disturbance, it was concluded that additional laboratory analysis of the artifacts was not warranted and they were not collected, but a large sample was inventoried in conjunction with the archaeological testing.

Photograph 1. Fuel Tanks Retention Basin Berms with Dense Surface Artifacts (view southeast)

The field inventory of the artifacts was organized by superimposing a grid of 109 units, each 65 feet (20 m) square, across the artifact scatter. Each of the 3 tanks occupies approximately 4 grid units, leaving 97 grid units covering approximately 9.6 acres (38,800 square m). Two person-days had been allocated for the field inventory but the quantity of artifacts proved to be more than 4 times greater than originally estimated. After 6 person-days of field effort (by a 2-person URS crew assisted by APS archaeologist Chris Watkins, an experienced pottery analyst who classified the pottery), the inventory was halted with 12 grid units along the southern edge of the targeted area remaining uncounted. It was decided that the 2,082 artifacts that had been inventoried were an adequate sample (**Figure 4**).

About 87 percent of the inventoried artifacts are potsherds and 12 percent are flaked stone (**Table 1**). Less common types of artifacts include 6 pieces of ground stone, 3 hammerstones, 3 pieces of marine shell, and 2 pieces of what appeared to be burned daub, which suggests some type of earth-covered shelter may have been present and burned. A fragment of worked and burned faunal bone (probably part of an awl or hairpin) also was inventoried.

This figure has been removed from this report to restrict distribution of sensitive information.

Surface Artifacts
Figure 4

An additional 47 fragments of inventoried faunal remains almost certainly were naturally deposited and do not reflect human activities. Those remains include 16 bone fragments identified as jackrabbit, 4 as cottontail, 1 as rabbit, 7 as bird, 3 as large mammal, 2 as medium-large mammal, 2 as medium mammal, 1 as small-medium mammal, and 1 as small mammal, as well as 10 fish bones or fish scales. (The crew saw an osprey perching in the project area with a fish that probably had been caught in Tempe Town Lake.)

Table 1. Summary of Field Inventoried Artifacts

Artifact Type	Count	Percentage
ceramics	1,813	87.1%
flaked stone	254	12.2%
ground stone	6	0.3%
hammerstones	3	0.1%
marine shell	3	0.1%
daub	2	0.1%
faunal bone	1	0.0%
total	2,082	100%

About 84 percent of the sherds are plain ware, which is not temporally diagnostic but reflects a Hohokam affiliation, although 4 atypical unidentified sherds do not appear to be of Hohokam origin (**Table 2**). Almost 70 percent of the plain ware sherds have sand temper indicative of locally made Salt Plain (formerly Gila Plain, Salt variety). Gila Plain (formerly Gila Plain, Gila variety) sherds with mica schist temper were probably made in the Gila River valley and are less common (12 percent). About 13 percent of the plain ware sherds are Wingfield Plain (phyllite temper), and almost 2 percent have Squaw Peak schist temper, indicating they were made in the northern part of the Salt River valley. Steinbach and others (2008) hypothesized that the uncommon occurrence of Wingfield Plain and Squaw Peak schist tempered pottery in field house site AZ U:9:281(ASM) south of the La Plaza site could indicate the residents of the La Plaza village hired "migrant laborers" from the north side of the Salt River valley to work their fields. The relatively high percentage of the phyllite and Squaw Peak schist tempered plain ware in another field context at site AZ U:9:311(ASM) near the La Plaza village site lends some support to that hypothesis.

Table 2. Summary of Field Inventoried Ceramics

Pottery Type	Count	Percentage
Salt Plain (sand temper)	1,068	58.9%
Wingfield Plain (phyllite temper)	243	13.4%
buff ware	210	11.6%
Gila Plain (mica schist temper)	177	9.8%
Salt Red (sand temper)	45	2.5%
plain ware (Squaw Peak schist temper)	30	1.7%
Gila Red (mica schist temper)	21	1.2%
Salado Polychrome (6 Gila Polychrome)	7	0.4%
Gila Butte Red-on-buff	4	0.2%
unidentified plain ware (probably not Hohokam)	4	0.2%
Sacaton Red-on-buff	3	0.2%
unidentified ware	1	0.1%
total	1,813	100%

About 12 percent of the inventoried sherds are buff ware, most of which lack painted red designs. Buff ware proportions of 20 percent or more are typical of pre-Classic period assemblages (Watts and others 2012). Casa Grande Red-on-buff was used during the Soho phase of the early Classic period, but Classic period assemblages generally have less than 10 percent buff ware because red ware was becoming more common. The Hohokam no longer made buff ware during the Civano phase of the late Classic period.

Four sherds have designs characteristic of Gila Butte Red-on-buff, which dates to the early Colonial period, and 3 sherds are Sacaton Red-on-buff, which dates to the subsequent Sedentary period. About 4 percent of the inventory is red ware, with locally made sherds with sand temper (Salt Red) being about twice as

common as those with mica schist temper (Gila Red), which were probably made in the Gila River valley. The red ware is indicative of the Classic period. The inventory includes 7 Salado Polychrome sherds (6 identified specifically as Gila Polychrome), which date to the Civano phase.

In summary, few of the inventoried sherds are temporally diagnostic but they indicate at least intermittent use of the site over a period of approximately seven centuries from the early Colonial period through the late Classic period (circa A.D. 750 to 1450). Although buff ware sherds are more than three times as numerous as red ware sherds, the relatively low percentage of buff ware within the assemblage suggests the most intensive use might have been during the Classic period.

The flaked stone that constitutes 12 percent of the artifact inventory is mostly knapping debris and primarily secondary and tertiary flakes. No projectile points were identified, but one tertiary rhyolite flake appeared to be a tool fragment, two fine-grain basalt tertiary flakes had unifacially worked edges, and a chert flake had evidence of use wear. Two bifacial thinning flakes were identified. Seven pieces are cores of fine-grain basalt, dacite, and chert, which are the most common types of toolstone in the assemblage (85 percent) (**Table 3**). A piece of obsidian shatter probably was not of local origin, but the other types of toolstone probably could have been collected from the gravels of the Salt River channel and terraces.

Table 3. Summary of Field Inventoried Flaked Stone

Type	Basalt	Dacite	Chert	Quartzite	Rhyolite	Jasper	Obsidian	Quartz	Granite	Unidentified	Totals	%
core	1	5	1								7	2.8%
primary flake[1]	8	2	3	1						1	15	5.9%
secondary flake[2]	72	24	9	12	4	1		1	1	2	126	49.6%
tertiary flake[3]	64	6	13	4	4	1				4	96	37.8%
bifacial thinning			2								2	0.8%
shatter	2		4		1		1				8	3.1%
totals	147	37	32	17	9	2	1	1	1	7	254	100%
percentages	57.9%	14.6%	12.6%	6.7%	3.5%	0.8%	0.4%	0.4%	0.4%	2.8%	100%	

Note: [1] dorsal surface covered with cortex, [2] some cortex on dorsal surface, [3] no cortex

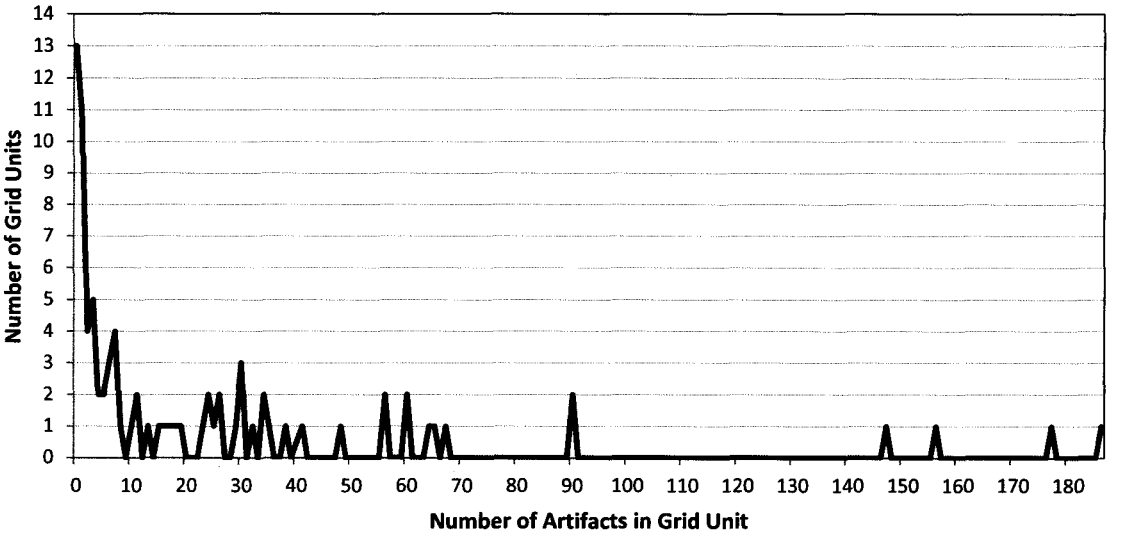
The inventory includes six pieces of ground stone of vesicular basalt or unidentified types of rock (**Table 4**). One of the artifacts is a complete one-hand mano that was used not only for grinding but wear on one end indicated it also was used for pounding. Two other pieces are mano fragments. Another piece was a fragment of a metate with a well-worn trough, and another piece of indeterminate form might have been part of a metate. An uncommon form of ground stone artifact was a sphere about the size of a softball.

Table 4. Summary of Field Inventoried Ground Stone

Type	Type of Rock
mano, 1-hand, with pounding wear on end	vesicular basalt
mano, mid-section fragment	vesicular basalt
mano, mid-section fragment	unidentified
metate, fragment with well-worn trough	vesicular basalt
indeterminate form, possible metate fragment	vesicular basalt
ball	unidentified

The rarer types of inventoried items include three small pieces of worked marine shell. One was half of a tinkler ornament, probably made from a cone shell (*Conus* sp.). Another fragment had ridges suggesting it was a scallop shell (*Pecten* sp. or *Argopecten* sp.). The third piece was a nondiagnostic fragment.

The average number of artifacts inventoried in each grid unit is 25 (about 6 artifacts per 1,076 square feet or 100 square m). As is typical of archaeological data, the spatial distribution of the surface artifacts was highly clustered. Only about one-third of the grid units had 25 or more artifacts. The 6 grid units with the most artifacts had 41 percent of the entire inventory (**Figure 5**). Those high density units were along the eastern edge of the retention basin, particularly on the berm along the southeastern part of the basin.



Frequency Distribution of Field Inventoried Surface Artifacts per Grid Unit
Figure 5

Artifacts were generally sparse on the floor of the retention basin. Artifact densities are higher on the earthen berms probably because the berms have eroded considerably leaving the artifacts as a lag deposit on the ground surface. The distribution of surface artifacts clearly is the result of construction disturbance, but because the method used to construct the berms is not documented, it is difficult to surmise where the artifacts might have originated, other than somewhere within the basin.

The possibility that the dirt used to create the berms might have been imported was considered, because the local soil does not seem to be particularly stable, and the surface of the berms seemed to have more clay than the local sediments. Closer inspection of the berms, however, indicated that what appeared to be fine sediment probably is a coating of some type of soil cement that might have been applied to retard erosion of the berms. A check of construction drawings indicated the berms were built of "common fill" and there was no documentation to indicate the dirt was hauled in from outside the power plant parcel. The cost of importing dirt strongly suggests the berms were built of material excavated from the basin (Scott McClellan, APS project manager, personal communication, 6 November 2013).

A scatter of approximately six plain ware potsherds were found about 200 feet (60 m) east of the southern part of the basin, and a whole metate was found 65 feet (20 m) northeast of that sparse scatter (refer to Figure 4). The backhoe operator who excavated the archaeological test trenches told the crew that he had dumped about 1 foot (30 cm) of dirt in the area in 2012. He had excavated the dirt to expand a storm water retention basin in the southeastern part of the power plant parcel. (APS archaeologist Chris Watkins inspected that retention basin and found no artifacts.) The only other artifact on the ground surface was a metate fragment about 220 feet (67 m) east of the northern part of the fuel storage tank retention basin.

The number of inventoried potsherds is more than seven times greater than the number of pieces of flaked stone, but their distributions are generally similar (**Figure 6**). The other types of artifacts are so rare that they cannot be expected to indicate meaningful patterning, especially in such a disturbed context. The distribution of buff ware, red ware, and polychrome sherds are, in general, similarly distributed, but the grid units with the densest buff ware are on the southeastern berm of the retention basin, and many of the grids with the highest red ware densities are in the northern part of the retention basin (**Figure 7**). Four of the seven Salado Polychrome sherds were clustered in two adjacent grid units on the central part of the eastern retention basin berm, but contrary to what might be expected if those sherds were indicative of a late Classic period locus, buff ware was much more common than red ware in those units.

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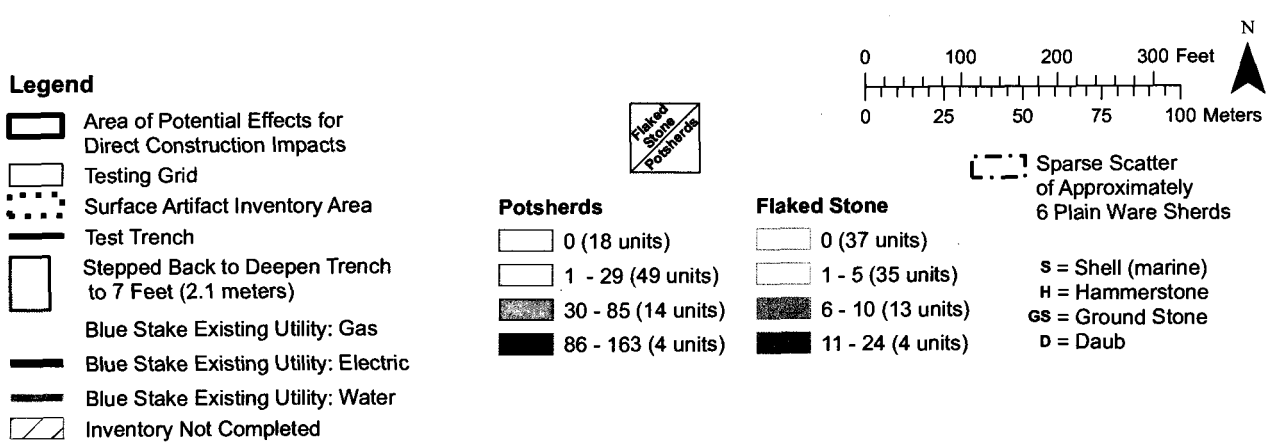

Distribution of Field Inventoried Surface Potsherds, Flaked Stone, and Other Artifacts
Figure 6

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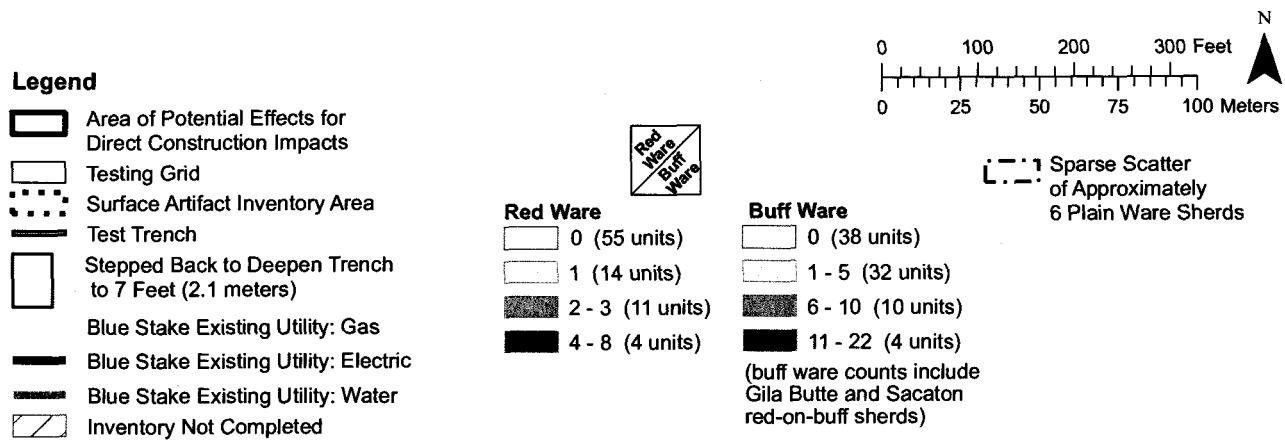

Distribution of Field Inventoried Surface Buff Ware, Red Ware and Polychrome Potsherds
Figure 7

ARCHAEOLOGICAL TEST TRENCHING

Thirteen test trenches were excavated with a backhoe equipped with a bucket 3 feet (0.9 m) wide (**Table 5**). The trenches accumulated to 1,390 linear feet (424 m) and 0.09 acre (388 square m) of area. Two of the trenches were outside the APE that was eventually defined for the project and the other 11 trenches constitute only about a 0.6 percent sample of the APE. About 7.4 acres (3.0 hectares) of the APE, however, has been extensively disturbed by excavation of the fuel tanks retention basin and buried or overhead utilities and other components of the power plant such as paved roads restricted testing. The extent of trenching represents more than a 1 percent sample of remaining areas of the APE.

Table 5. Archaeological Test Trenches

Trench	Length		Depth		Orientation	Results
	feet	meters	feet	meters		
1a	345	105	4	1.2	north-south	7 chert flakes (all probably from one core) and 1 quartzite flake in east wall
1b	190	58	4	1.2	north-south	1 plain ware sherd and 1 red-on-buff sherd in east wall
1c	150	46	4	1.2	east-west	
2	50	15	4	1.2	north-south	Holocene gravels in lower part of trench
3	50	15	4	1.2	north-south	
4	50	15	5	1.5	north-south	Feature 1, irrigation lateral canal; 3 sherds (including 1 Salado Polychrome) in west wall, 3 flakes in east wall
5	50	15	5	1.5	north-south	
6	50	15	5	1.5	north-south	1 plain ware sherd and 3 rocks in west wall
7	50	15	5	1.5	north-south	1 sherd and 1 rock (manuport) in west wall
8	50	15	5	1.5	north-south	
9	50	15	5	1.5	north-south	
10	50	15	5	1.5	east-west	1 large plain ware sherd in bottom of trench, almost entire soil column fill material or eroded deposits
11	120	37	5	1.5	northwest-southeast	2 sherds in north wall
12	50	15	5	1.5	east-west	mottled charcoal/ash stains in south wall
13	50	15	5	1.5	east-west	mottled charcoal/ash stains in south wall
total	1,390	424				

Note: All the trenches were excavated with a backhoe equipped with a bucket 3 feet (0.9 m) wide.

APS retained Vargas General Engineering, a firm with prior experience at the Ocotillo Power Plant, to excavate the trenches. The first phase of testing involved excavating a long L-shaped trench east of the retention basin (**Figure 8**). Because of safety concerns, the trench was dug to a depth of only 4 feet (1.2 m). The north-south part of the trench was divided into north (1a) and south (1b) segments that were about 345 feet (105 m) long and 190 feet (58 m) long, respectively (**Photographs 2 and 3**). A gap about 25 feet (8 m) long between 1a and 1b was not excavated to avoid cutting off access to a storage yard. The east-west segment (1c) was 150 feet (46 m) long (**Photograph 4**). Ramps were left unexcavated at intervals of 50 feet (15 m) to provide safe exits.

Trench 1 revealed that the uppermost layer (Stratum I) consisted of approximately about 0.5 foot (15 cm) of platy sandy clay loam often mixed with gravel and represents a zone of disturbance and fill related to development of the power plant. Stratum II typically is a dark brown sandy clay loam that extends to a depth of about 1.2 feet (37 cm), and represents the plow zone that was disturbed by decades of farming prior to construction of the power plant. Lower strata exposed in Trench 1 are C horizon loam that is lighter brown or yellowish brown with various amounts of sand, silt, and clay. Subdivisions of the horizon were ambiguous.

No archaeological features were identified, but 6 maroon-brown chert flakes were found clustered in the east wall of Trench 1a at the bottom of the trench about 3.9 feet (1.2 m) below the surface (appended **Figure C-2**). Another chert flake of the same color was found about 16 inches (40 cm) to the north and

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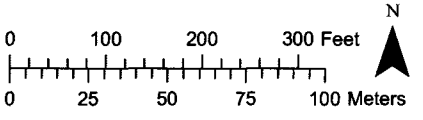


Legend

Exterior Edge of Berm

Area of Potential Effects for Direct Construction Impacts

Tr # = Trench Number

Test Trench

Existing Utilities

Blue Stake Existing Utility: Gas

Blue Stake Existing Utility: Electric

Blue Stake Existing Utility: Water

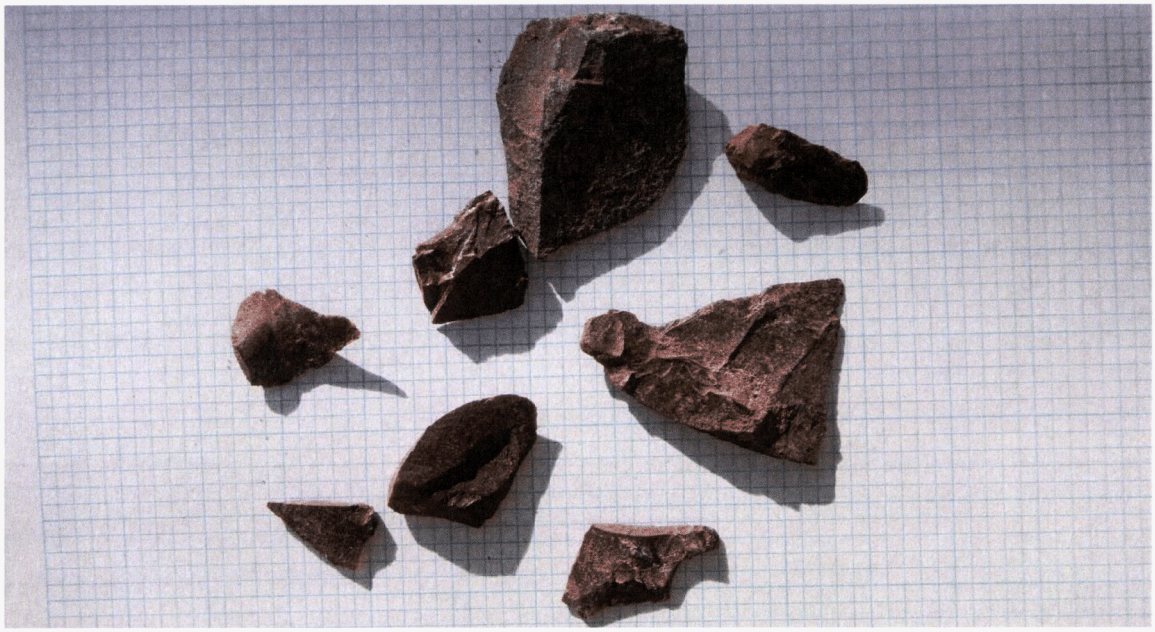
Archaeological Test Trenches
Figure 8

Photograph 2. Test Trench 1a (view north)

Photograph 3. Test Trench 1b (view south)

Photograph 4. Test Trench 1c (view east)

about 5.5 inches (14 cm) higher in the profile and a secondary gray quartzite flake was found at a similar depth just above the cluster of 6 chert flakes (**Photograph 5**). The cluster of flakes appeared to be in an erosional cut or the north slope of a bench or subterrace but the profile exposure was ambiguous. The similarity of the chert flakes suggest they were struck from a single core, and the relatively minor horizontal and vertical dispersion of the artifacts in the profile suggests they had not been severely eroded.



Photograph 5. Flakes found in Trench 1a (view north) (background squares are 0.1 inch [2.5 millimeters])

An eroded red-on-buff sherd (without diagnostic designs) and a plain ware sherd were found in the walls of Trench 1b about 4 feet (1.2 m) below the surface. No other artifacts or archaeological features were noted in Trench 1. The meager findings suggested that whatever archaeological deposits that had been disturbed when the fuel tanks retention basin was excavated to the west and resulted in the deposition of thousands of artifacts on the surrounding berms did not extend to the vicinity of Trench 1.

To further investigate the cluster of flakes exposed in the east wall of Trench 1a, the southern end of the trench was extended to connect with Trench 1b (after APS identified an alternate access to the adjacent storage yard and approved trenching through the access road), and a segment of the trench about 50 feet (15 m) long was widened to about 19 feet (6 m) so the trench could be safely excavated deeper without shoring. The trench reached a depth of about 7 feet (2.1 m). The trench proved to be within a broad erosional channel, and yielded no information about deeper strata outside the channel that might contain archaeological features and artifacts.

Because the results of the initial test trench were ambiguous, a second phase of testing was conducted and 12 more trenches were excavated. The locations of those trenches were judgmentally selected to avoid buried gas, electrical, and water lines and to disperse them across the area that might be disturbed by construction of potential upgrades of the power plant (refer to Figure 8). Trenches 2 and 3 within the retention basin were dug to a depth of 4 feet (1.2 m) and the rest were excavated to 5 feet (1.5 m).

Cobbles with calcium carbonate (caliche) coatings, which require thousands of years to form, were found near the bottom of Trench 2 at an estimated depth of about 9 feet (2.7 m) below the modern ground surface outside the retention basin. Although that layer of cobbles was not found in Trench 3, it probably underlies the entire project area but has an undulating swale and bar morphology formed by flood flows. The cobbles, which probably date to the mid-Holocene (5,000 to 8,000 years ago), represent a high energy

deposit that would not preserve archaeological features and deposits and therefore define the maximum potential depth of archaeological materials.

Trenches 4, 5, 6, and 7 were then excavated to the north and northeast of the retention basin, in an area that appears to be relatively undisturbed by the development of the power plant. Trenches 8, 9, 10, 12, and 13 were excavated to further explore areas east of Trench 1.

Trench 4, in the very northwest corner of the power plant parcel, cross-sectioned a buried Hohokam irrigation canal and yielded the most useful information about the site stratigraphy (**Figure 9**). Stratum III, as defined in that trench, is a layer of light brown sandy loam that represents over bank deposits of Salt River flood flows that postdate the Hohokam occupation. The underlying Strata IV, V, and VI contain archaeological deposits. The canal, which was oriented to the west/northwest, had been excavated into Stratum VI, a layer of mottled brown to dark brown clay to loam (**Photograph 6**).

Photograph 6. Profile of Canal Feature 1, West Wall, Trench 4 (trench is about 5 feet [1.5 meters] deep)

The bottom of the canal extended slightly below the bottom of the test trench, which was dug to a depth of 5 feet (1.5 m). The sediments on the north and south sides of the canal vary from dark brown to brown clay to sandy clay loam, and were designated Stratum Va. Those deposits probably accumulated in fields watered by the canal, but further investigation is needed to confirm that the Hohokam farmed the surrounding area. The ditch is filled with dark brown clay that was designated Stratum Vb. Scattered charcoal in Stratum V and the overlying Stratum IV, a brown to light brown silt loam, may represent burning of field stubble or weeds.

Three flakes and three sherds were found in the trench walls in association with the ditch and a Salado Polychrome sherd recovered from the dirt excavated from the trench suggests the canal probably dates to the late Classic period Civano phase. Pre-Classic period Hohokam or perhaps even pre-Hohokam archaeological deposits might be buried more deeply.

Feature 1, a Hohokam Irrigation Canal in Test Trench 4
Figure 9

Trench 11 was excavated to connect Trenches 4 and 5 to trace the strata bearing archaeological materials. Those strata pinch out or are more deeply buried to the east and it is not clear how extensive they might be. Strata correlations in trenches farther to the east are ambiguous, but a sherd and some charcoal flecking were noted at a depth of about 3.3 feet (1 m) in Trench 6, and charcoal staining was noted at depths of about 3.3 to 3.9 feet (1.0 to 1.2 m) in Trenches 12 and 13 farther to the east, suggesting that pockets of intact archaeological deposits might be present in those areas.

A rain storm during the testing fieldwork flooded the test trenches and eroded some of the test trench walls. Selected segments of trench walls were scraped again and a sample of soil column profiles were recorded (refer to Appendix C).

GEOARCHAEOLOGY OF THE OCOTILLO POWER PLANT PARCEL

This section summarizes the geomorphological setting of the Ocotillo Power Plant parcel, based on prior mapping of landforms (Wellendorf and others 1986) and soils (Adams 1974) and the results of the archaeological testing, and discusses implications for the archaeological record of the project area. The Ocotillo Power Plant is on the Lehi terrace approximately 0.5 mile (0.8 km) south of the Salt River (refer to Figure 2) and 5 feet (1.5 m) above the river channel, where inflatable flood control dams were installed in the late 1990s to create Tempe Town Lake, an urban recreational facility that is about 800 to 1,200 feet (240 to 360 m) wide, 2 miles (3.2 km) long, and an average of about 13 feet (4 m) deep. Prior to 1911, when Roosevelt Dam was completed about 50 miles (80 km) upstream, river flows fluctuated seasonally and floods periodically inundated the Lehi terrace which is the lowest terrace of the Salt River and represents the geologic floodplain. Over bank flood flows deposited extensive layers of sand, silt, and clay on the floodplain, along with sand and gravel in erosional channels.

Gilman Loam covers broad swaths of the Lehi terrace, including the project area. Typically, the upper A horizon of Gilman Loam is pale brown and has been plowed to a depth of at least 1 foot (0. 3m). The C1 horizon, which commonly extends to a depth of 2 feet (0.6 m), is light yellowish brown. The C2 horizon, of similar color and texture, extends to depths of at least 5 feet (1.5 m). Gilman Loam is highly variable, both vertically and horizontally, particularly on floodplains, reflecting the dynamic nature of the landscape (Adams 1974). The soil tends to be moderately alkaline but is suitable for irrigation agriculture.

During the middle Holocene, approximately 5,000 to 8,000 years ago, the main channel of the Salt River was broad, extending well south of the project area. The channel was characterized by gravel bars and sandy swales. A remnant of this ancient channel was exposed in the lower part of Trench 2 excavated in the southern part of the fuel tanks retention basin. Cobbles within that deposit had calcium carbonate (caliche) coatings that require thousands of years to form. The mid-Holocene gravels and cobbles were not found in the similar Trench 3 excavated farther north within the retention basin, indicating that the upper surface of those cobbles and gravels undulates beneath the project area.

The modern floodplain landscape is the result of aggradation over the past 5,000 years or so, under a climate regime similar to that of today. Between approximately A.D. 750 and 1450, the Hohokam farmed on the floodplain, and the canal Feature 1 and artifacts found in the project area are evidence of that use. Large Hohokam villages, including the nearby La Plaza site just south and west of the power plant parcel, were located on the higher Mesa terrace some 10 to 15 feet (3.0 to 4.5 m) above the Salt River channel.

Figure 10 illustrates a generalized schematic cross section of the six sedimentary units identified within the archaeological test trenches. Those units include:

Stratum I: 0 to 0.5 feet (0 to 15 cm); modern disturbance; platy sandy clay loam to milled gravel

Stratum II: 0.5 to 1.2 feet (15 to 35 cm); plow zone; dark brown sandy clay loam

Stratum III: 1.2 to 2.3 feet (35 to 70 cm); C1 horizon; light brown sandy loam to sand; texture and depth vary across project area

Stratum IV: 2.3 to 2.8 feet (70 to 85 cm); C2 horizon; brown to light brown silt loam; occasional charcoal lenses at upper boundary; northwestern part of project area culturally modified; pinches out to the east

Stratum V: 2.8 to 4.0 feet (85 to 120 cm); C3 horizon; dark brown to brown clay to sandy clay loam, mottled; dark brown and culturally modified in northwestern project area where the unit is associated with agricultural irrigation; brown in southeastern part of project area with occasional artifacts; found at or below the base of 4-foot (1.2-m) trenches

Stratum VI: 4.0+ feet (120+ cm); C4 horizon; brown to reddish brown loam; seen only in 5-foot (1.5-m) trenches in the northwestern project area; expected below the bases of other trenches.

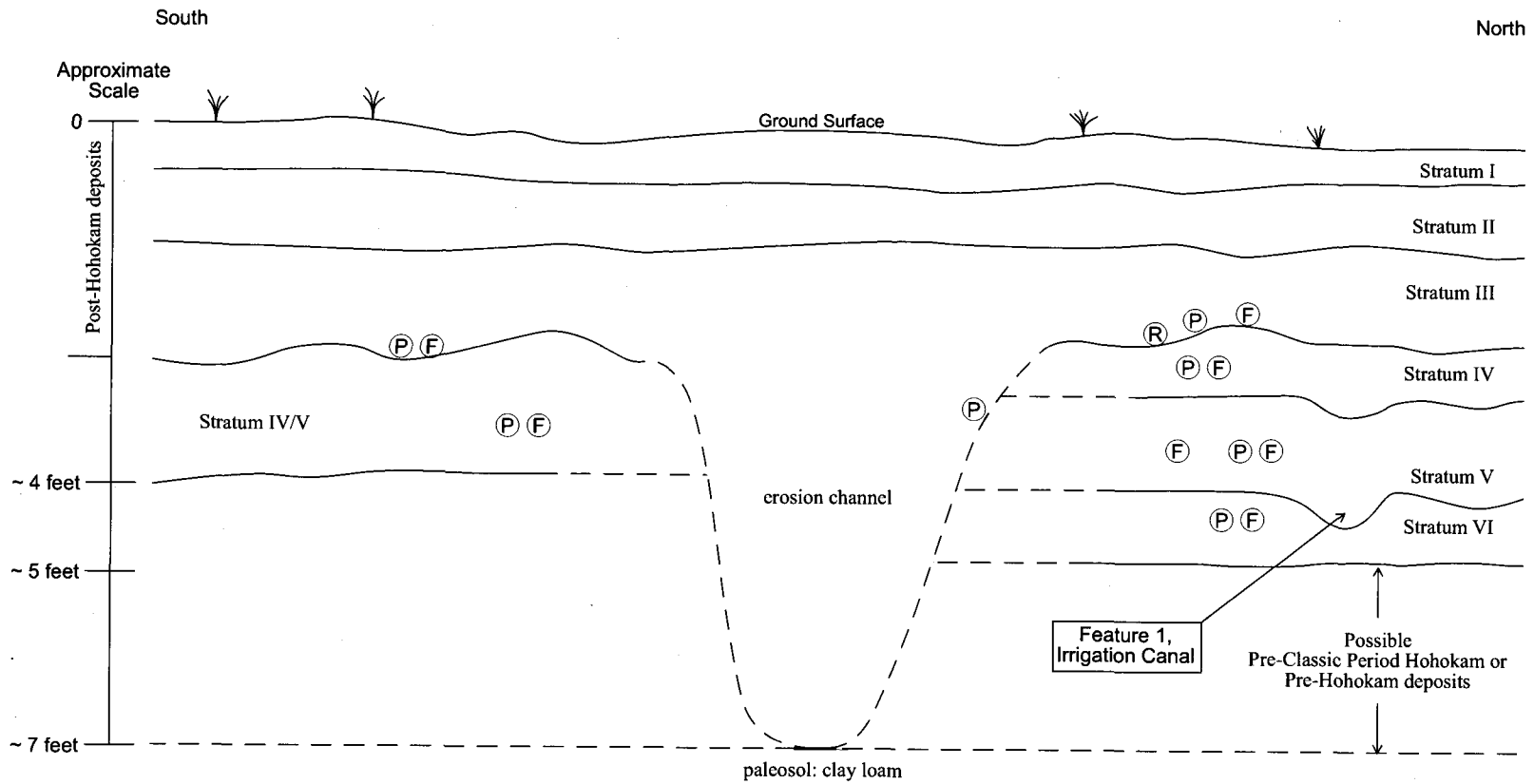
In the northwest part of the project area, a remnant of a Hohokam irrigation ditch was exposed in Trench 4. The ditch was filled with sediment that extended out of the canal and into Stratum V. Artifacts within and adjacent to the canal indicate the canal and Stratum V probably date to the Hohokam Classic Period (circa A.D. 1150 to 1450), indicating that the approximately 2.3 feet (70 cm) of Strata I through III were deposited during the 5 to 6 centuries after the Hohokam abandoned the area. Hohokam artifacts found in those layers are in eroded secondary contexts—not the locations in which they were originally deposited.

Because Stratum V, which dates to the Hohokam Classic period, was found near the base or extended below the bases of most of the test trenches, it is possible that archaeological deposits dating to the Hohokam pre-Classic period or perhaps even pre-Hohokam times might be present at greater depths. Unfortunately, the short segment of the southern end of Trench 1a that was excavated deeper provided no evidence about the potential for earlier deposits because the trench was within a sand and gravel filled erosional channel that originated in Stratum III and postdates the Hohokam occupation. Because of the limited extent of deep trenching, the extent of that erosion channel was not determined.

At the base of the deep trench, channel deposits of Stratum III rested on an eroded paleosol represented by clay loam with evidence of soil development that represents a period of landscape stability, possibly on the order of a few centuries. The contact between the bottom of the Stratum III channel and the lower paleosol is an unconformity representing an unknown extent of erosion and length of time. Because none of the trenches exposed the relationship of the paleosol to the higher stratigraphic units in the soil column, the paleosol was not assigned a numeric designation. Although limited, the evidence suggests there could be approximately 3 feet (1 m) of sediment between Stratum V and the paleosol elsewhere on site, and those deposits could contain artifacts and archaeological features dating to the Hohokam pre-Classic period or perhaps even the pre-Hohokam Early Agriculture or Archaic periods.

CONCLUSION AND RECOMMENDATIONS

Archaeological studies initiated as early as the 1880s have documented that the Hohokam occupied a large village known as La Plaza for approximately a thousand years from about A.D. 450 to 1450. That village was located within 0.5 mile (0.8 km) or less to the south and west of the Ocotillo Power Plant parcel. Two archaeological excavation projects conducted since 2010 in the northeastern part of the Arizona State University campus about 0.5 mile (0.8 km) west of the power plant parcel demonstrated that the Hohokam farmed on the low Lehi Terrace—the geologic floodplain landform on which the power plant is located. Archaeological features such as canals, activity areas with fire pits and other types of pits, and remnants of temporary field houses are typically found in areas that the Hohokam farmed.



Stratum I: 0 to 0.5 feet (0-15 cm); modern disturbance; platy sandy clay loam to milled gravel

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Stratum III: 1.2 to 2.3 feet (35-70 cm); C1 horizon; light brown sandy loam to sand; texture and depth vary across project area

Stratum IV: 2.3 to 2.8 feet (70-85 cm); C2 horizon; brown to light brown silt loam; occasional charcoal lenses at upper boundary; northwestern part of project area culturally modified; pinches out to the east

Stratum V: 2.8 to 3.9 feet (85-120 cm); C3 horizon; dark brown to brown clay to sandy clay loam, mottled; dark brown and culturally modified in northwestern project area where the unit is associated with agricultural irrigation; brown in southeastern part of project area with occasional artifacts; found at or below the base of 4-foot (1.2-m) trenches

Stratum VI: 3.9+ feet (120+ cm); C4 horizon; brown to reddish brown loam; seen only in 5-foot (1.5 m) trenches in the northwestern project area; expected below the bases of other trenches.

Figure 10 Generalized Schematic Stratigraphy of the Project Area

Evidence of the La Plaza village site, which includes pit houses arranged in courtyard groups and later adobe houses often within adobe-walled compounds, ceremonial structures such as platform mounds, cemeteries, and various other types of features reflecting permanent habitation, is confined to the higher Mesa terrace. Three human burials have been found at a field house site south of La Plaza (Steinbach and others 2008) indicating human remains are sometimes present in field settings, but Hohokam burials are much more commonly found within village sites (for example, Cox and Rogge 2012).

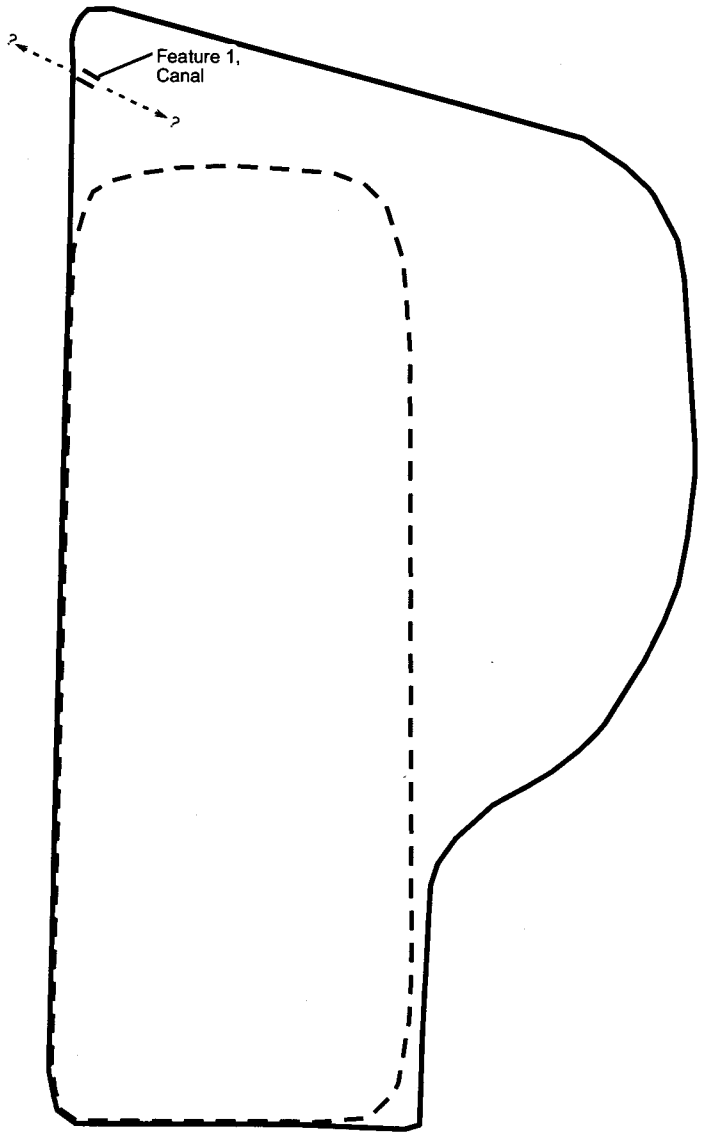
Temporally diagnostic potsherds among the 2,082 artifacts that were field inventoried indicate the Hohokam probably farmed on the Lehi terrace (geologic floodplain) within the power plant parcel between the Gila Butte phase of the early Colonial period and the late Classic period Civano phase (circa A.D. 750 to 1450). As expected, the testing revealed that construction of the power plant, decades of earlier farming, and flood flows on the floodplain had disturbed much of the project area, but the discovery of buried strata with archaeological deposits and an irrigation canal at depths of about 3 to 5 feet (1 to 1.5 m) in the northwest corner of the power plant parcel indicate that the archaeological record of the project area remains at least partially intact. Those strata thin to the east or are deeper than the test trenches. Because the canal appears to date to the final Civano phase of the Hohokam occupation there is potential that earlier Hohokam or perhaps even pre-Hohokam deposits might be more deeply buried in parts of the project area.

Testing east of the fuel tanks retention basin failed to find any archaeological features or many artifacts, suggesting that excavation of the retention basin may have removed most of the intact archaeological deposits and any archaeological features that were present. The testing also indicated that 2.3 feet (0.7 m) or more of sediments have been deposited across the area by flood flows after the Hohokam occupation ended about 5 centuries ago. The one trench that was dug deeper revealed an erosion channel that extended to a depth of about 7 feet (2.1 m) and was underlain by an eroded paleosol of undetermined age. Although the lateral extent of the erosion channel was not determined it could be extensive and the few artifacts found in trenches east of the retention basin appear to be in eroded contexts.

An archaeological site, designated AZ U:9:311(ASM), was defined to encompass the extensive scatter of disturbed artifacts, the one buried canal feature that was found, and a surrounding area where a few buried artifacts were found and other features might be present (**Figure 11**). Because there are so few surface clues about the extent of the site, the site boundaries are somewhat arbitrary and further excavation is necessary to better define the limits of the site. The currently available information is summarized in an attached site description (**Appendix D**).

Site AZ U:9:311(ASM) appears to be the remnants of a Hohokam field that probably was farmed during the late Classic period Civano phase (circa A.D. 1300-1450) and perhaps as early as the Gila Butte phase of the Colonial period (circa A.D. 750). It is recommended that the site be considered eligible for the Arizona Register under Criterion D for its potential to yield important information about Hohokam agriculture and settlement of the Phoenix Basin. Because the canal feature identified at the site is buried, horizontal exposure has potential to identify a network of field ditches, which have been documented only rarely at other Hohokam sites. Analyses of charred macrobotanical specimens, pollen, and biosilicates could identify what crops the Hohokam grew on the Salt River floodplain; radiocarbon dating has potential to determine when the Hohokam used the area; and study of the canal could yield information about its engineered characteristics such as flow rates, capacity, and amount of area that it could have watered.

The canal and adjacent field areas are buried in the very northwestern corner of the power plant parcel, and it might be possible to design the proposed new facilities to avoid disturbance of the area. If not, it is recommended that a plan be developed and implemented to recover information and artifacts from the area prior to any construction activity.



The aerial photograph background has been removed from this copy of the report.

Restrict distribution of this map to avoid vandalism of archaeological sites, as provided for by Section 304 of the National Historic Preservation Act, Section 9(a) of the Archaeological Resources Protection Act, and Section 39-125 of the Arizona Revised Statutes.

Aerial Source: Flood Control District of Maricopa County 2012, Data Purchase

Legend

Site AZ U:9:311(ASM) Boundary

Highly Disturbed Artifact Scatter

N

0 100 200 300 Feet

0 25 50 75 100 Meters

Map of Site AZ U:9:311(ASM)
Figure 11

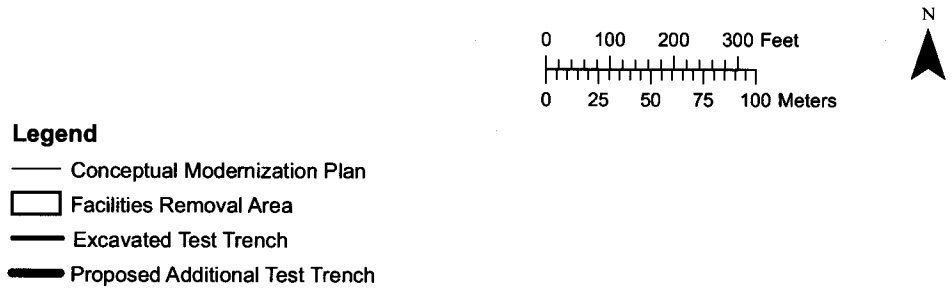
Deeper testing is needed to further evaluate whether intact archaeological deposits might be present in areas beyond the northwestern corner of the power plant parcel below the depths of the test trenches that were excavated. The safety requirements for stepping back or shoring trenches deeper than 5 feet (1.5 m) make such testing complicated and costly. The proposed modernization of the power plant will involve deep excavations for new combustion turbine foundations. If the construction schedule could be designed to dig the required deeper excavations early in the process and accommodate archaeological monitoring and time to excavate any archaeological features that might be discovered, monitoring could be an effective strategy for checking for deeper archaeological deposits. Such a strategy entails the risk of construction delays if archaeological excavations to recover and preserve artifacts and information take more time than allocated.

An alternative would be to excavate more test trenches during continued design of the new facilities and preconstruction planning, targeting the testing in those areas that would be disturbed by deep excavations for turbine foundations. A schematic layout of five trenches, each about 50 feet (15 m) long, is shown on **Figure 12.** Those locations are proposed because they are closest to the proposed locations of the turbines that would require deep structural foundations and are immediately outside the previously disturbed fuel tanks retention basin and the basin berms where surface artifacts were dense. Obsolete piping for the fuel storage tanks would need to be removed before trenches could be dug at the depicted locations.

Additional test trenches are proposed along the east-west segment of the internal access road if it is determined that subgrade preparation would extend below the plow zone and deeper deposits may be relatively undisturbed. No testing is proposed along the north-south segment of the road alignment because installation of large buried water and gas lines have disturbed that corridor and excavating test trenches near those major utility lines would entail safety risks and could damage the lines, which are critical for operating the power plant.

It should be recognized that more preconstruction testing may not eliminate a need for archaeological monitoring of construction activities unless the results indicate there is little potential for human remains to be buried in areas that would be disturbed by construction of the proposed new facilities. Even if more preconstruction testing does not eliminate the need for archaeological monitoring of construction to ensure that human remains are treated in accordance with the Arizona Burial Law, additional testing should provide information about the extent of disturbed deposits and what areas would not warrant monitoring.

This figure has been removed from this report to restrict distribution of sensitive information.



Schematic Strategy for Deeper Testing
Figure 12

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The restricted distribution map in this appendix has been removed from this copy of the report.

Appendix A

Figure A-1. Archaeological Sites and Hohokam and Historic Canal Alignments near the Ocotillo Power Plant

RESTRICT DISTRIBUTION TO PREVENT VANDALISM

To avoid vandalism, restrict information about the location of archaeological sites, as provided for by Section 39-125 of the Arizona Revised Statutes.

Appendix B – Field Inventory of Surface Artifacts

(compiled by Chad Kirvan, Regina Chapin-Pyritz, and Christopher Watkins on 26 and 27 November 2013)

Table B-1. Ceramic Potsherds

Grid Unit	Count	Ware	Type	Temper
A01	1	plain	Salt Plain	sand
B03	1	plain	Salt Plain	sand
B04	1	plain	Salt Plain	sand
C02	1	red	Salt Red	sand
C02	1	plain	Salt Plain	sand
C03	1	buff		
C03	2	plain	Salt Plain	sand
C04	3	red	Salt Red	sand
C09	5	plain	Gila Plain	mica schist
D01	1	red	Salt Red	sand
D01	1	plain	Gila Plain	mica schist
D01	2	plain		Squaw Peak schist
D02	1	red	Gila Red	mica schist
D02	1	plain	Gila Plain	mica schist
D02	5	plain	Salt Plain	sand
D03	2	buff		
D03	1	plain	Gila Plain	mica schist
D03	3	plain	Salt Plain	sand
D03	3	plain	Wingfield Plain	phyllite
D04	2	buff		
D04	1	red	Gila Red	mica schist
D04	2	red	Salt Red	sand
D04	6	plain	Gila Plain	mica schist
D04	8	plain	Salt Plain	sand
D04	1	plain	Wingfield Plain	phyllite
D04	1	plain		Squaw Peak schist
D05	1	red	Salt Red	sand
D05	4	plain	Gila Plain	mica schist
D05	7	plain	Salt Plain	sand
D05	1	plain		Squaw Peak schist
D06	2	buff		
D06	1	red	Salt Red	sand
D06	4	plain	Salt Plain	sand
E01	1	buff		
E01	1	plain	Gila Plain	mica schist
E01	5	plain	Salt Plain	sand
E02	1	plain	Salt Plain	sand
E06	1	red	Salt Red	sand
E06	4	plain	Salt Plain	sand
E06	1	plain	Wingfield Plain	phyllite
E07	1	not determined		
F01	1	red	Gila Red	mica schist
F01	3	red	Salt Red	sand
F01	8	plain	Salt Plain	sand
F05	1	buff	Gila Butte Red-on-buff	
F06	1	buff		
F06	1	Salado Polychrome	Gila Polychrome	
F06	1	red	Gila Red	mica schist
F06	4	red	Salt Red	sand
F06	4	plain	Gila Plain	mica schist
F06	15	plain	Salt Plain	sand
F06	1	plain	Wingfield Plain	phyllite
G01	2	Salado Polychrome	Gila Polychrome	
G01	1	plain	Gila Plain	mica schist
G01	6	plain	Salt Plain	sand
G02	2	buff		
G02	2	plain	Salt Plain	sand

Grid Unit	Count	Ware	Type	Temper
G03	1	buff		
G03	1	red	Salt Red	sand
G03	1	plain	Wingfield Plain	phyllite
G04	1	plain		Squaw Peak schist
G05	1	buff		
G05	1	plain	Gila Plain	mica schist
G05	3	plain	Salt Plain	sand
G06	1	buff	Gila Butte Red-on-buff	
G06	1	buff		
G06	3	red	Salt Red	sand
G06	1	plain	Gila Plain	mica schist
G06	18	plain	Salt Plain	sand
G06	1	plain		Squaw Peak schist
G06	1	plain	Wingfield Plain	phyllite
H01	1	buff	Sacaton Red-on-buff	
H01	3	buff		
H01	1	plain	Gila Plain	mica schist
H01	17	plain	Salt Plain	sand
H01	2	plain		Squaw Peak schist
H02	5	buff		
H02	1	red	Gila Red	mica schist
H02	5	red	Salt Red	sand
H02	4	plain	Gila Plain	mica schist
H02	23	plain	Salt Plain	sand
H02	3	plain		Squaw Peak schist
H02	6	plain	Wingfield Plain	phyllite
H03	5	buff		
H03	3	red	Salt Red	sand
H03	1	plain	Gila Plain	mica schist
H03	9	plain	Salt Plain	sand
H03	3	plain		Squaw Peak schist
H03	4	plain	Wingfield Plain	phyllite
H04	6	buff		
H04	5	plain	Gila Plain	mica schist
H04	23	plain	Salt Plain	sand
H04	17	plain	Wingfield Plain	phyllite
H05	1	buff	Sacaton Red-on-buff	
H05	3	buff		
H05	6	plain	Gila Plain	mica schist
H05	19	plain	Salt Plain	sand
H05	3	plain	Wingfield Plain	phyllite
H06	2	buff		
H06	2	red	Salt Red	sand
H06	1	plain	Gila Plain	mica schist
H06	15	plain	Salt Plain	sand
H06	2	plain		Squaw Peak schist
H06	2	plain	Wingfield Plain	phyllite
I01	4	buff		
I01	1	plain	Gila Plain	mica schist
I01	7	plain	Salt Plain	sand
I01	1	plain	Wingfield Plain	phyllite
I02	3	buff		
I02	1	red	Salt Red	sand
I02	7	plain	Gila Plain	mica schist
I02	19	plain	Salt Plain	sand
I03	8	buff		
I03	9	plain	Gila Plain	mica schist
I03	34	plain	Salt Plain	sand
I03	8	plain	Wingfield Plain	phyllite

Grid Unit	Count	Ware	Type	Temper
I04	2	buff		
I04	1	red	Gila Red	mica schist
I04	4	plain	Gila Plain	mica schist
I04	27	plain	Salt Plain	sand
I04	2	plain		Squaw Peak schist
I04	1	plain	Wingfield Plain	phyllite
I05	2	buff		
I05	1	red	Gila Red	mica schist
I05	1	red	Salt Red	sand
I05	5	plain	Gila Plain	mica schist
I05	19	plain	Salt Plain	sand
I05	1	plain		Squaw Peak schist
I06	10	buff		
I06	2	red	Gila Red	mica schist
I06	6	red	Salt Red	sand
I06	3	plain	Gila Plain	mica schist
I06	53	plain	Salt Plain	sand
I06	1	plain		Squaw Peak schist
I06	9	plain	Wingfield Plain	phyllite
J01	3	buff		
J01	1	red	Gila Red	mica schist
J01	1	plain	Gila Plain	mica schist
J01	13	plain	Salt Plain	sand
J01	3	plain	Wingfield Plain	phyllite
J02	1	buff		
J02	4	plain	Salt Plain	sand
J02	1	plain	Wingfield Plain	phyllite
J04	1	plain	Salt Plain	sand
J05	1	buff		
J05	2	plain	Salt Plain	sand
J05	2	plain	Wingfield Plain	phyllite
J06	9	buff		
J06	3	Salado Polychrome	Gila Polychrome	
J06	38	plain	Salt Plain	sand
J06	11	plain	Wingfield Plain	phyllite
K01	1	buff	Sacaton Red-on-buff	
K01	2	buff		
K01	3	plain	Gila Plain	mica schist
K01	15	plain	Salt Plain	sand
K01	2	plain	Wingfield Plain	phyllite
K05	3	plain	Salt Plain	sand
K06	11	buff		
K06	1	Salado Polychrome		
K06	2	red	Salt Red	sand
K06	5	plain	Gila Plain	mica schist
K06	30	plain	Salt Plain	sand
K06	7	plain	Wingfield Plain	phyllite
L01	1	buff		
L01	1	plain	Gila Plain	mica schist
L01	15	plain	Salt Plain	sand
L01	5	plain	Wingfield Plain	phyllite
L02	1	plain	Gila Plain	mica schist
L02	2	plain	Salt Plain	sand
L02	1	plain	Wingfield Plain	phyllite
L06	2	buff		
L06	6	plain	Gila Plain	mica schist
L06	12	plain	Salt Plain	sand
L06	3	plain	Wingfield Plain	phyllite

Grid Unit	Count	Ware	Type	Temper
M01	1	buff		
M01	2	red	Gila Red	mica schist
M01	1	red	Salt Red	sand
M01	4	plain	Gila Plain	mica schist
M01	8	plain	Salt Plain	sand
M01	9	plain	Wingfield Plain	phyllite
M01	1	plain	not Hohokam?	
M02	3	buff		
M02	2	red	Gila Red	mica schist
M02	1	red	Salt Red	sand
M02	5	plain	Gila Plain	mica schist
M02	29	plain	Salt Plain	sand
M02	9	plain	Wingfield Plain	phyllite
M03	2	buff		
M03	3	red	Gila Red	mica schist
M03	4	plain	Gila Plain	mica schist
M03	25	plain	Salt Plain	sand
M03	3	plain	Wingfield Plain	phyllite
M04	4	buff		
M04	2	red	Gila Red	mica schist
M04	9	plain	Gila Plain	mica schist
M04	30	plain	Salt Plain	sand
M04	3	plain		Squaw Peak schist
M04	6	plain	Wingfield Plain	phyllite
M05	9	buff		
M05	48	plain	Salt Plain	sand
M05	5	plain		Squaw Peak schist
M05	22	plain	Wingfield Plain	phyllite
M06	1	buff	Gila Butte Red-on-buff	
M06	21	buff		
M06	1	red	Gila Red	mica schist
M06	28	plain	Gila Plain	mica schist
M06	84	plain	Salt Plain	sand
M06	2	plain		Squaw Peak schist
M06	26	plain	Wingfield Plain	phyllite
N01	8	buff		
N01	5	plain	Gila Plain	mica schist
N01	23	plain	Salt Plain	sand
N02	1	buff		
N02	2	plain	Gila Plain	mica schist
N02	12	plain	Salt Plain	sand
N02	2	plain	Wingfield Plain	phyllite
N04	2	plain	Salt Plain	sand
N05	1	buff		
N05	2	plain	Salt Plain	sand
N05	1	plain	Wingfield Plain	phyllite
N06	1	buff	Gila Butte Red-on-buff	
N06	16	buff		
N06	12	plain	Gila Plain	mica schist
N06	90	plain	Salt Plain	sand
N06	18	plain	Wingfield Plain	phyllite
N06	1	plain	not Hohokam?	
O01	5	buff		
O01	1	red	Gila Red	mica schist
O01	1	plain	Gila Plain	mica schist
O01	9	plain	Salt Plain	sand
O01	2	plain	Wingfield Plain	phyllite
O02	4	buff		
O02	7	plain	Salt Plain	sand
O05	1	plain	Salt Plain	sand

Grid Unit	Count	Ware	Type	Temper
O06	16	buff		
O06	1	red	Salt Red	sand
O06	11	plain	Gila Plain	mica schist
O06	81	plain	Salt Plain	sand
O06	29	plain	Wingfield Plain	phyllite
P01	1	buff		
P01	1	red	Salt Red	sand
P01	2	plain	Gila Plain	mica schist
P01	8	plain	Salt Plain	sand
P01	1	plain	Wingfield Plain	phyllite
P05	1	plain	Salt Plain	sand
P06	21	buff		
P06	4	plain	Gila Plain	mica schist
P06	113	plain	Salt Plain	sand
P06	21	plain	Wingfield Plain	phyllite
P06	2	plain	not Hohokam?	
total	1,813			

Table B-2. Flaked Stone

Grid Unit	Count	Material	Type	Description	Color
A02	1	quartzite	tertiary		gray
B04	1	quartzite	tertiary		orange/brown
C01	1	fine-grain basalt	tertiary	unifacially worked	blackish gray
C09	1	quartzite	secondary		gray brown
D01	1	chert	secondary		
D01	1	dacite	secondary		
D02	1	chert	tertiary		white
D02	1	quartzite	secondary		black
D02	1	quartzite	tertiary		black
D03	1	quartzite	tertiary		dark red
D03	1	unidentified	tertiary		orange
D04	2	fine-grain basalt	secondary		
D04	1	chert	shatter		yellowish brown
D04	1	rhyolite	tertiary	possible tool fragment	
D04	1	unidentified	tertiary		brown
E01	1	dacite	core ?		
E04	1	granite	secondary		
E05	2	fine-grain basalt	secondary		
E05	1	dacite	secondary		
F01	1	fine-grain basalt	primary		
F01	1	fine-grain basalt	secondary		
F01	3	dacite	secondary		
F01	1	quartzite	secondary		
F02	1	chert	bifacial thinning		brown
F05	1	chert	shatter		purple
F06	1	fine-grain basalt	primary		
F06	1	dacite	tertiary		
F06	1	rhyolite	shatter		
G01	1	fine-grain basalt	secondary		
G01	1	chert	broken flake		pink, translucent
G01	1	chert	secondary		brown
G01	1	quartzite	secondary		green
G03	1	unidentified	primary		
G05	1	quartzite	secondary		
G05	1	rhyolite	secondary		
G06	1	fine-grain basalt	secondary		
G06	2	dacite	secondary		
G06	1	rhyolite	secondary		
H02	2	fine-grain basalt	secondary		
H02	3	fine-grain basalt	tertiary		
H02	3	dacite	secondary		
H02	1	rhyolite	secondary		
H03	4	fine-grain basalt	secondary		
H03	1	chert	tertiary		white
H03	1	chert	shatter		gray
H03	1	quartz	secondary		
H04	2	fine-grain basalt	secondary		
H04	2	fine-grain basalt	tertiary		
H04	1	chert	secondary		brown
H04	1	dacite	primary		
H04	3	dacite	secondary		
H04	1	obsidian	shatter		
H04	2	quartzite	secondary		

Grid Unit	Count	Material	Type	Description	Color
H05	1	fine-grain basalt	tertiary		
H05	1	chert	bifacial thinning		pink
H05	1	dacite	secondary		
H05	1	quartzite	secondary		pink
H05	1	quartzite	secondary		white
H05	1	rhyolite	tertiary		
H06	3	fine-grain basalt	secondary		
H06	1	dacite	tertiary		
H06	1	unidentified	tertiary		
I01	1	fine-grain basalt	secondary		
I01	1	chert	tertiary		dark gray
I01	1	dacite	core		
I01	1	dacite	secondary		
I02	1	chert	tertiary		gray
I02	1	dacite	core		
I02	1	quartzite	primary		red
I02	1	quartzite	secondary		red
I04	4	fine-grain basalt	tertiary		
I04	1	rhyolite	tertiary		
I05	2	fine-grain basalt	secondary		
I05	1	chert	core		white
I05	1	jasper	tertiary		
I06	1	fine-grain basalt	secondary		
I06	2	dacite	core		
I06	1	dacite	tertiary		
J01	1	fine-grain basalt	primary		
J01	1	fine-grain basalt	secondary		
J01	1	fine-grain basalt	tertiary		
J01	1	chert	tertiary		white/pink
J05	2	fine-grain basalt	secondary		
J06	1	fine-grain basalt	tertiary	unifacially worked	
J06	1	chert	secondary		gray
J06	1	chert	secondary		red
J06	1	chert	tertiary		white
J06	1	dacite	secondary		
J06	1	dacite	tertiary		
K01	1	fine-grain basalt	primary		
K01	3	fine-grain basalt	tertiary		
K01	1	chert	tertiary		dark green/black
K01	2	dacite	secondary		
K06	2	fine-grain basalt	secondary		
K06	4	fine-grain basalt	tertiary		
K06	2	dacite	secondary		
K06	1	jasper	secondary		
L01	1	fine-grain basalt	tertiary		
L01	1	fine-grain basalt	shatter		
L01	1	chert	tertiary		brown
L01	1	dacite	secondary		
L02	1	fine-grain basalt	tertiary		
L06	1	fine-grain basalt	secondary		
M01	3	fine-grain basalt	secondary		
M01	1	fine-grain basalt	tertiary		
M01	1	chert	secondary		gray
M01	1	chert	secondary		red
M01	1	chert	tertiary		white
M01	1	dacite	tertiary		
M02	4	fine-grain basalt	secondary		
M02	3	fine-grain basalt	tertiary		

Grid Unit	Count	Material	Type	Description	Color
M03	1	fine-grain basalt	primary		
M03	3	fine-grain basalt	secondary		
M03	3	fine-grain basalt	tertiary		
M03	1	chert	primary		brown
M03	1	dacite	primary	broken flake	
M03	1	dacite	secondary		
M04	4	fine-grain basalt	tertiary		
M04	2	unidentified	secondary		
M05	3	fine-grain basalt	secondary		
M05	1	fine-grain basalt	tertiary		
M05	1	fine-grain basalt	shatter		
M05	1	chert	secondary		cream/gray
M06	1	fine-grain basalt	primary		
M06	7	fine-grain basalt	secondary		
M06	2	fine-grain basalt	tertiary		
M06	1	chert	primary		gray
M06	1	chert	tertiary		light brown
M06	1	rhyolite	tertiary		
M06	1	unidentified	tertiary		
N01	1	fine-grain basalt	secondary		
N01	3	fine-grain basalt	tertiary		
N02	1	fine-grain basalt	secondary		
N02	1	quartzite	secondary		
N03	1	rhyolite	secondary		
N04	1	fine-grain basalt	tertiary		
N06	1	fine-grain basalt	primary		
N06	10	fine-grain basalt	secondary		
N06	5	fine-grain basalt	tertiary		
N06	1	chert	secondary		cream
O01	2	fine-grain basalt	secondary		
O01	1	fine-grain basalt	tertiary		
O01	1	chert	tertiary	utilized flake	white
O01	1	chert	shatter		white
O06	3	fine-grain basalt	secondary		
O06	4	fine-grain basalt	tertiary		
O06	1	chert	tertiary		gray
O06	1	dacite	secondary		
P01	1	fine-grain basalt	secondary		
P01	2	fine-grain basalt	tertiary		
P06	1	fine-grain basalt	core	multidirectional	
P06	1	fine-grain basalt	primary		
P06	7	fine-grain basalt	secondary		
P06	12	fine-grain basalt	tertiary		
P06	1	chert	tertiary		cream
P06	1	dacite	secondary		
P06	1	dacite	tertiary		
total	254				

Table B-3. Ground Stone

Grid Unit	Count	Type	Material
H04	1	stone ball	unidentified
I03	1	metate fragment, well-worn trough	basalt, vesicular
I05	1	indeterminate form, possible metate fragment	basalt, vesicular
I06	1	mano, complete 1-hand, pounding wear on 1 end	basalt, pink
N01	1	mano fragment	basalt, vesicular
P06	1	mano fragment	unidentified (red)
total	6		

Table B-4. Hammerstones

Grid Unit	Count	Type	Material
I06	1	fragment	basalt
M03	1	fragment, well used	basalt, fine-grain
N06	1	fragment	basalt
total	3		

Table B-5. Marine Shell

Grid Unit	Count	Species	Description
D01	1	scallop, *Pecten* sp.? or *Argopecten* sp.?	small worked fragment with ridges
G04	1	unidentifiable	small worked fragment
M01	1	cone shell, *Conus* sp. ?	tinkler fragment, about half
total	3		

Table B-6. Faunal Bone

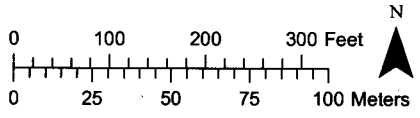
Grid Unit	Count	Species	Description
G02	1	unidentifiable	worked burned bone fragment, part of awl or hairpin

Table B-7. Other Materials

Grid Unit	Count	Material	Description
G01	2	daub	burned clay with stick impressions

Appendix C – Sample Profile Drawings of Archaeological Test Trenches

This figure has been removed from this report to restrict distribution of sensitive information.



Legend

Exterior Edge of Retention Basin Berm

Area of Potential Effects for Direct Construction Impacts

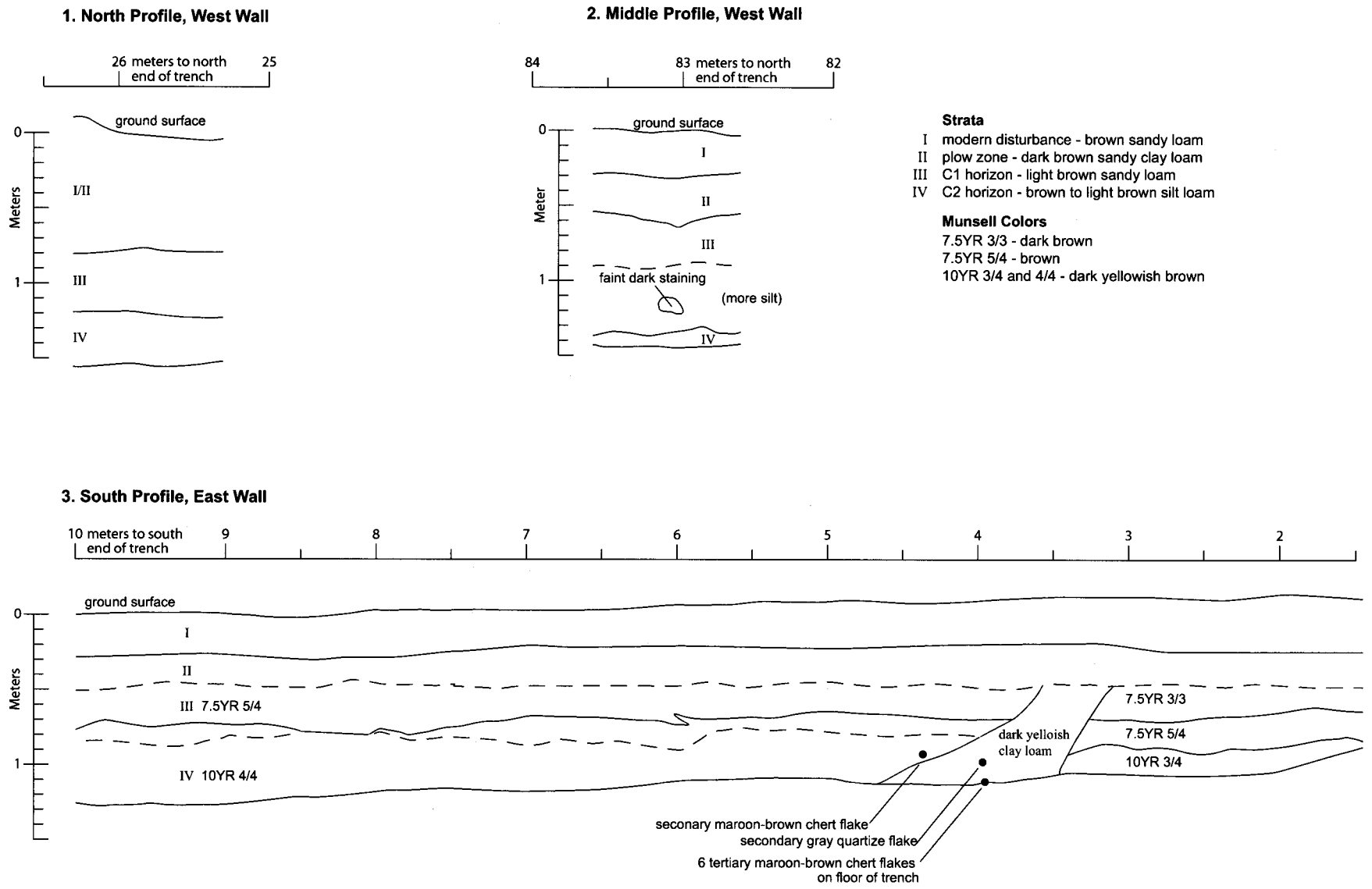
Profile Location

= Profile Number

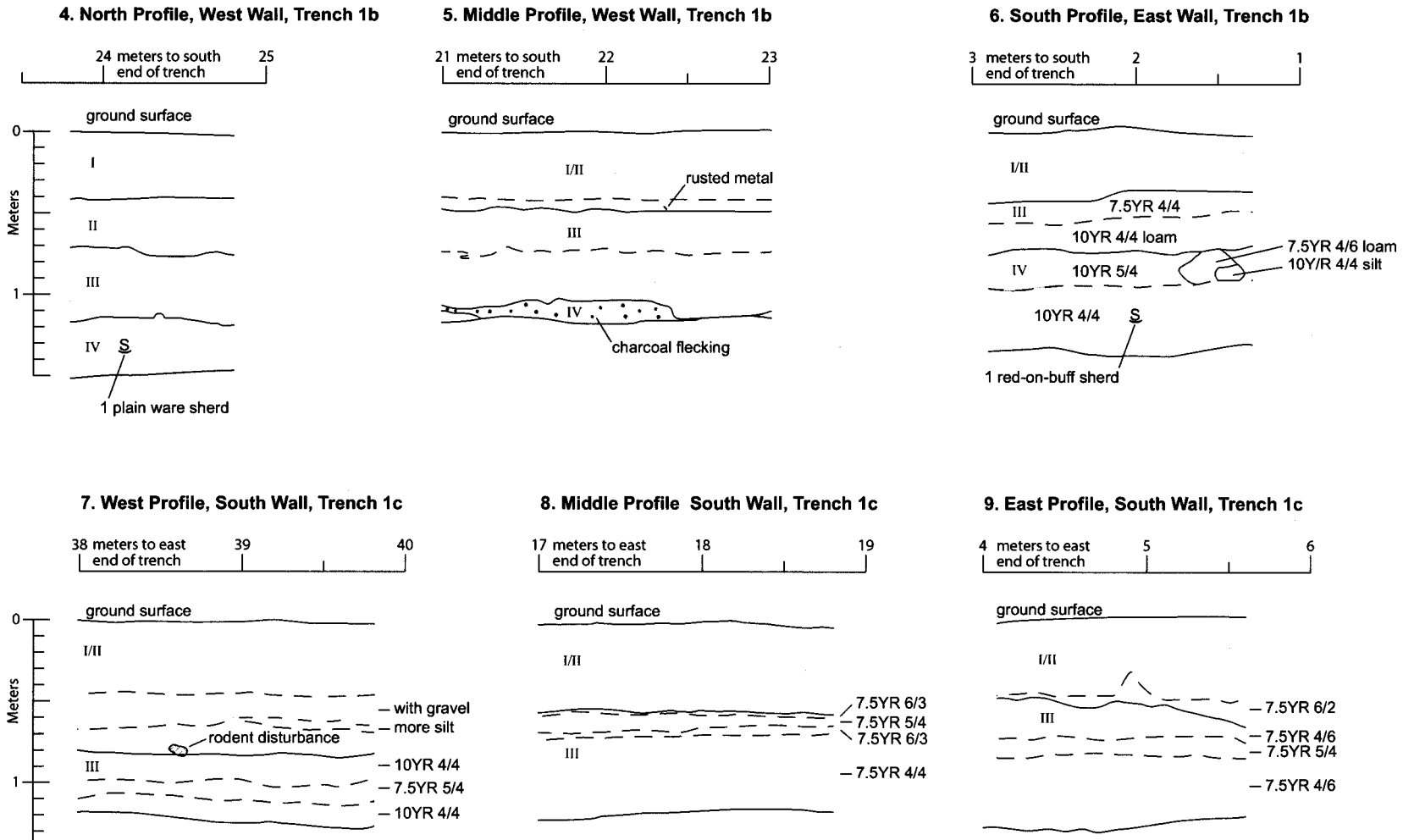
Tr # = Trench Number

Test Trench

Location of Selected Trench Profiles
Figure C-1



Trench 1a Profiles
Figure C-2



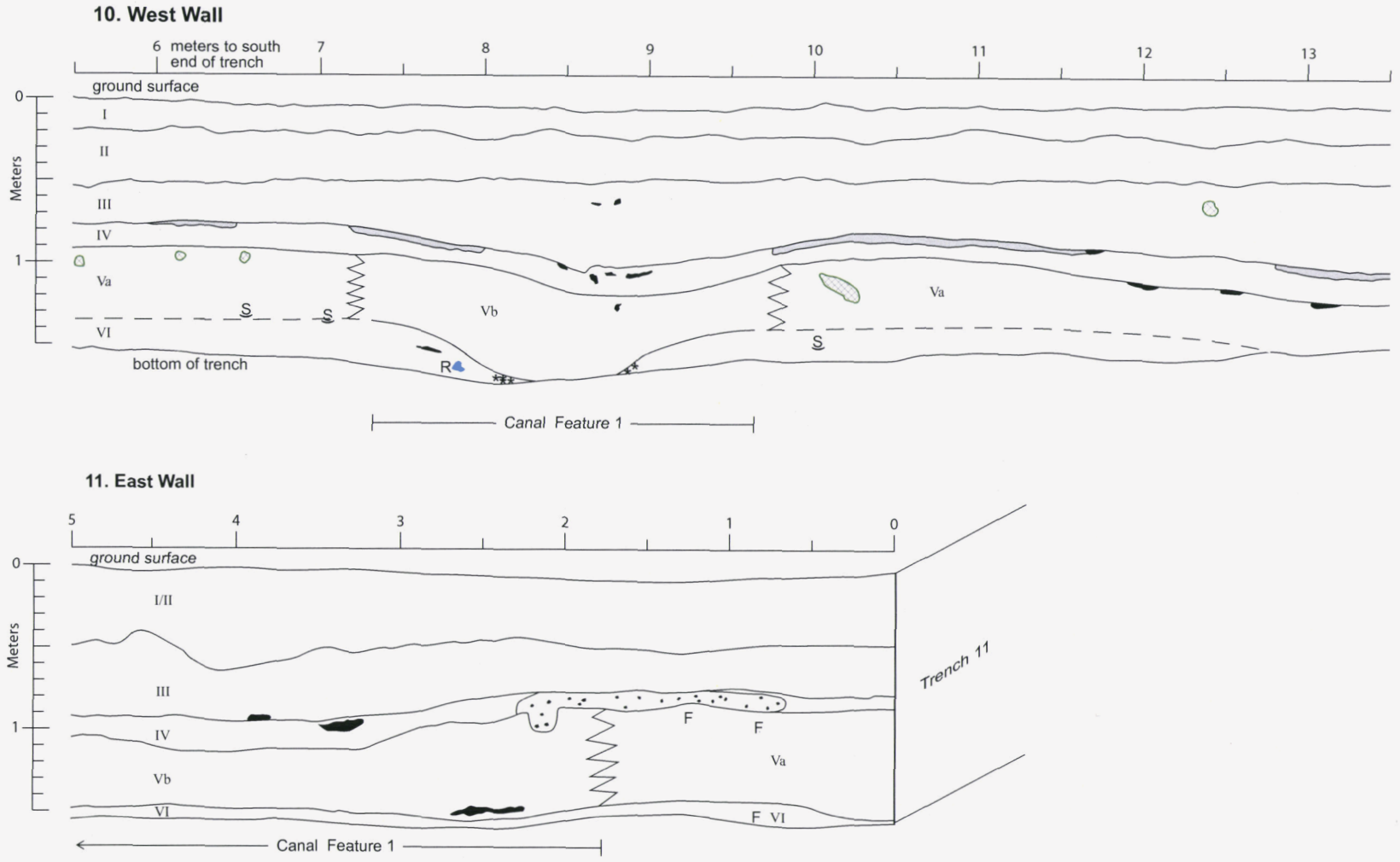
Strata

I modern disturbance - brown sandy loam
II plow zone - dark brown sandy clay loam
III C1 horizon - light brown sandy loam
IV C2 horizon - brown to light brown silt loam

Munsell Colors

7.5YR 4/4 and 5/4 - brown
7.5YR 4/6 - strong brown
7.5YR 6/2 - pinkish gray
7.5YR 6/3 - light brown
10YR 4/4 - dark yellowish brown
10YR 5/4 - yellowish brown

Sample Profiles of Trenches 1a and 1b
Figure C-3



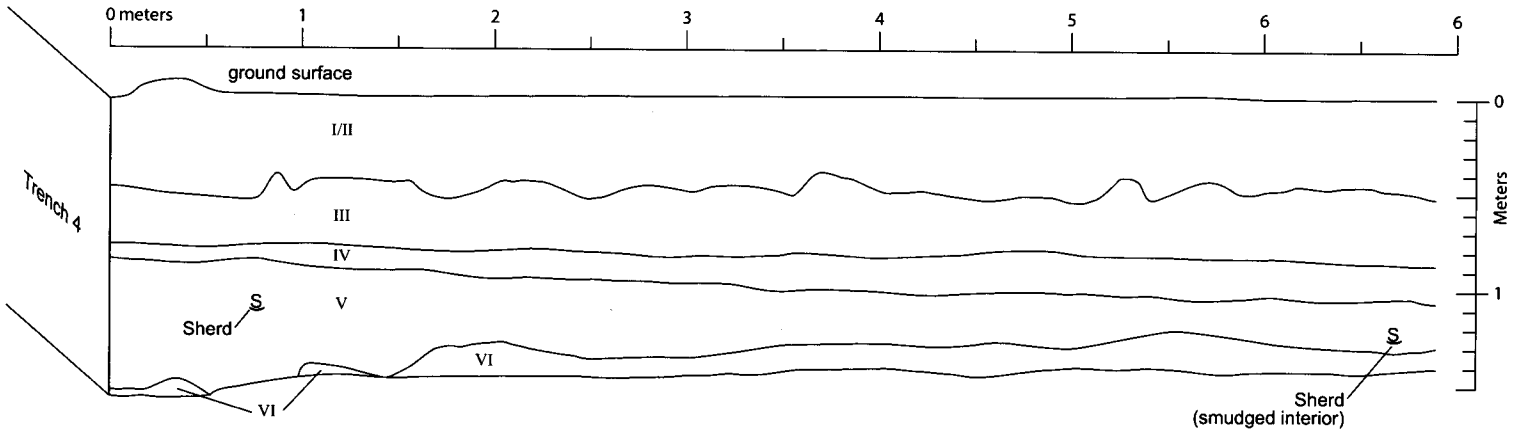
Strata

- I modern disturbance - brown sandy loam
- II plow zone - dark brown sandy clay loam
- III over bank deposits - light brown sandy loam
- IV archaeological deposit - brown to light brown silt loam
- Va archaeological deposit - dark brown to brown, clay to sandy clay loam, mottled
- Vb Feature 1 canal fill - dark brown clay
- VI archaeological deposit - dark brown to brown, clay to loam, extremely mottled

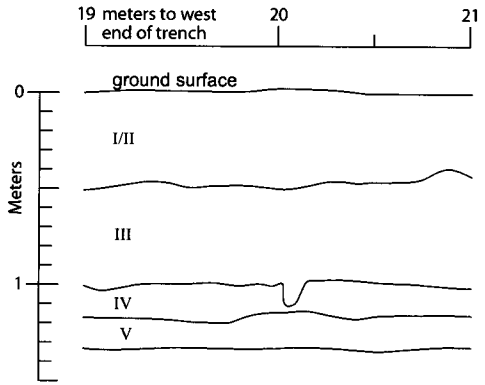
- clay lens
- * iron/manganese oxide stain
- charcoal
- F flake
- S sherd
- R rock
- rodent disturbance
- facies transition
- indistinct boundary

Trench 4 Profiles
Figure C-4

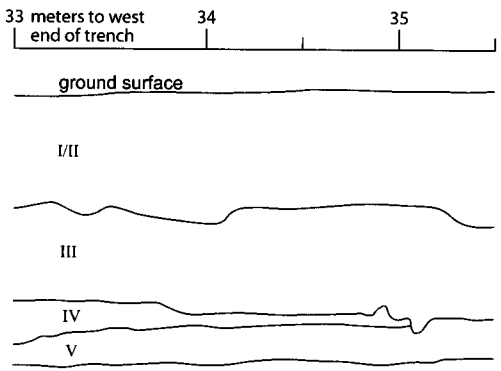
12. West Profile, North Wall, Trench 11



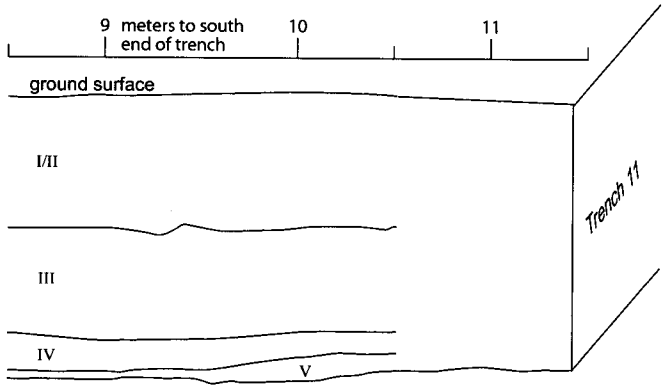
13. Center Profile, North Wall, Trench 11



14. East Profile, North Wall, Trench 11



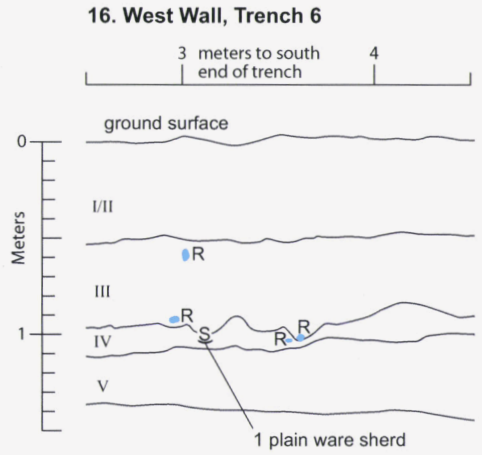
15. West Profile, Trench 5

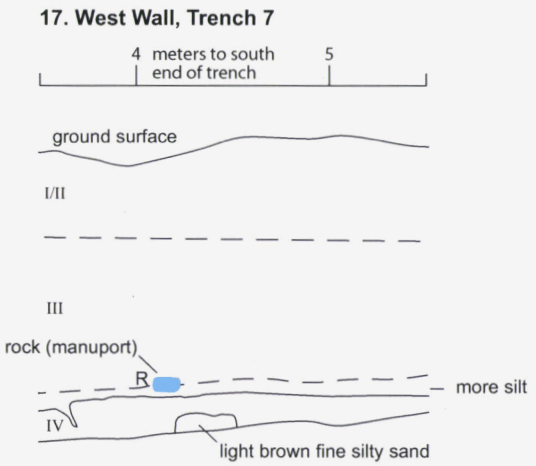


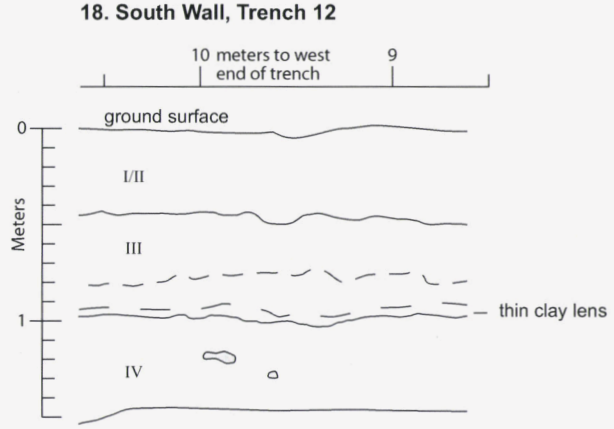
Strata

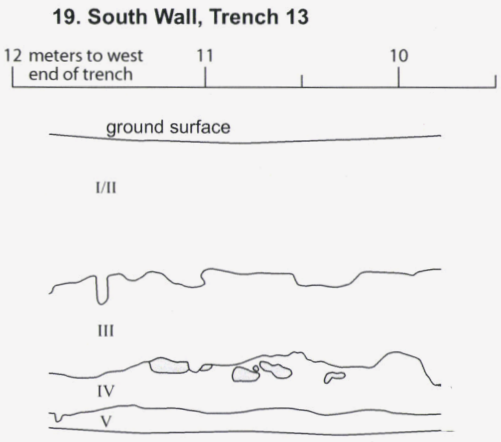
I modern disturbance - brown sandy loam
II plow zone - dark brown sandy clay loam
III over bank deposits - light brown sandy loam
IV archaeological deposit - brown to light brown silt loam
V archaeological deposit - dark brown to brown, clay to sandy clay loam, mottled
VI archaeological deposit - dark brown to brown, clay to loam, extremely mottled

Trenches 5 amd 11 Profiles
Figure C-5









Strata

I modern disturbance - brown sandy loam
II plow zone - dark brown sandy clay loam
III over bank deposits - light brown sandy loam
IV archaeological deposit - brown to light brown silt loam
V archaeological deposit - dark brown to brown, clay to sandy clay loam

mottled charcoal / ash
S sherd
R rock
indistinct boundary

Sample Profiles of Trenches 6, 7, 12, and 13
Figure C-6

Description of Site AZ U:9:311(ASM), a Hohokam Field

Cultural Affiliation/Age: Hohokam/Gila Butte phase through Civano Phase (circa A.D. 750-1450)

Site Type/Inferred Use: artifact scatter with buried irrigation canal/probable field area

Owner: private (Arizona Public Service Company)

U.S. Geological Survey 7.5-Minute Topographic Quadrangle: Tempe

Elevation: 1,170 feet (357 m) above sea level

Topographic Setting: Lehi terrace (lowest Salt River terrace)

Vegetation/Ground Visibility: none (graded and partially covered with gravel mulch/100 percent

Geology: extremely fine Quaternary alluvium, weakly to noncalichified silt over Lehi terrace gravel

Soils: Gilman loam

Site Condition within Study Area: highly disturbed by power plant development, and earlier farming

Maximum Dimensions: 800 by 1,500 feet (245 by 460 m) **Area:** 13.7 acres (5.54 hectares)

Features within Study Area: 1 (buried irrigation canal)

Historic Context: Hohokam occupation of the Salt River Valley, circa A.D. 500 to 1450

Arizona Register Recommendation: eligible, Criterion D

Field Observations: Site AZ U:9:311(ASM) appears to be an area of Hohokam fields on the Lehi terrace on the south side of the Salt River, and very likely is associated with the occupation of the village site of La Plaza, AZ U:9:165(ASM), which is located just to the south and west on the higher Mesa terrace. The site consists primarily of a highly disturbed artifact scatter and one buried feature—a Hohokam field lateral canal—discovered by archaeological testing. Because the site is so disturbed and has few surface clues about the extent of the site, the site boundaries were drawn somewhat arbitrarily to include the disturbed scatter of surface artifacts, the test trench where the canal was identified, and an area where testing identified a few buried artifacts and potential for other buried features. Further excavation is necessary to better define the extent of the site.

Artifact Scatter. The artifacts were highly disturbed by construction of three large fuel storage tanks associated with the Ocotillo Power Plant, and apparently were dug up when a retention basin was excavated to a depth of about 5 feet (1.5 m) around the fuel tanks. The artifacts are most dense on the earthen berm surrounding the basin, and apparently were concentrated as a lag deposit as the berm eroded. The possibility that the dirt used to create the berms around the retention basin was imported and the artifacts were brought to the site with that material was considered, but no evidence to support that hypothesis was identified. Because of the extent of disturbance, it was concluded that additional laboratory analysis of the artifacts was not warranted and they were not collected, but a large sample was inventoried in the field.

The inventory was organized by superimposing a grid of 109 units, each 65 feet (20 m) square, across the artifact scatter. Each of the 3 tanks covers approximately 4 grid units, leaving 97 grid units (approximately 9.6 acres or 38,800 square m). The field inventory was halted after 6 person-days of effort had tallied 2,082 artifacts, leaving 12 grid units along the southern edge of the targeted area uncounted.

The inventory is dominated by 1,813 potsherds (87%) and 254 pieces of flaked stone (12%). Less common types of artifacts include 6 pieces of ground stone, 3 hammerstones, 3 pieces of marine shell, 1 fragment of shaped and burned faunal bone (probably part of an awl or hairpin), and 2 pieces of what appeared to be burned daub, which suggests some type of earth-covered shelter may have been present and burned.

About 84 percent of the sherds (1,522) are plain ware, which is not temporally diagnostic but reflects a Hohokam affiliation, although 4 atypical unidentified sherds do not appear to be of Hohokam origin.

Almost 70 percent of the plain ware sherds (1,068) have sand temper indicative of locally made Salt Plain (formerly Gila Plain, Salt variety). Gila Plain (formerly Gila Plain, Gila variety) sherds with mica schist temper were probably made in the Gila River valley and are less common (177 or 12 percent). About 13 percent of the plain ware sherds (243) are Wingfield Plain (phyllite temper), and almost 2 percent (30) have Squaw Peak schist temper, indicating they were made in the northern part of the Salt River valley. It has been hypothesized that the uncommon occurrence of Wingfield Plain and Squaw Peak schist tempered pottery in field house site AZ U:9:281(ASM) south of the La Plaza site could indicate the residents of the La Plaza village hired "migrant laborers" from the north side of the Salt River valley to work their fields (Steinbach, Erik, Christopher N. Watkins, and Glen E. Rice [editors], 2008, *Hohokam Canals and Field Houses on the ASU Campus, Excavations at the Barrett Honors College Site, Arizona State University,* Technical Report 07-16, Rio Salado Archaeology, Tempe, Arizona). The relatively high percentage of the phyllite and Squaw Peak schist tempered plain ware in another field context at site AZ U:9:311(ASM) near the La Plaza village site lends some support to that hypothesis.

About 12 percent of the inventoried sherds (210) are buff ware, most of which lack painted red designs. Buff ware proportions of 20 percent or more are typical of pre-Classic period assemblages (Watts, Joshua, David R. Abbott, and Andrew D. Lack, 2012, Analysis of a Ceramic Assemblage from the Northwestern Portion of La Plaza [AZ U:9:165(ASM)], in *Archaeological Excavations at the Northwestern Edge of La Plaza, a Hohokam Village Site in Tempe, Arizona,* edited by Eric S. Cox and A.E. [Gene] Rogge, pp. 8-1 to 8-37, URS, Phoenix, Arizona). Casa Grande Red-on-buff was used during the Soho phase of the early Classic period, but Classic period assemblages generally have less than 10 percent buff ware because red ware was becoming more common. The Hohokam no longer made buff ware during the Civano phase of the late Classic period.

Four sherds have designs characteristic of Gila Butte Red-on-buff, which dates to the early Colonial period, and 3 sherds are Sacaton Red-on-buff, which dates to the subsequent Sedentary period. About 4 percent of the inventory is red ware (66), with locally made sherds with sand temper (Salt Red) being about twice as common as those with mica schist temper (Gila Red) (45 compared to 21), which were probably made in the Gila River valley. The red ware is indicative of the Classic period. The inventory includes 7 Salado Polychrome sherds (6 identified specifically as Gila Polychrome), which date to the Civano phase.

In summary, few of the inventoried sherds are temporally diagnostic but they indicate at least intermittent use of the site over a period of approximately seven centuries from the early Colonial period through the late Classic period (circa A.D. 750 to 1450). Although buff ware sherds are more than three times as numerous as red ware sherds, the relatively low percentage of buff ware within the assemblage suggests the most intensive use might have been during the Classic period.

The flaked stone is mostly knapping debris and primarily secondary (126) and tertiary (96) flakes. No projectile points were identified, but 1 tertiary rhyolite flake appeared to be a tool fragment, 2 fine-grain basalt tertiary flakes had unifacially worked edges, and 1 chert flake had evidence of use wear. Two bifacial thinning flakes were identified. Seven pieces are cores of fine-grain basalt, dacite, and chert, which are the most common types of toolstone in the assemblage (85 percent). A piece of obsidian shatter probably was not of local origin, but the other types of toolstone probably could have been collected from the gravels of the Salt River channel and terraces.

The inventory includes six pieces of ground stone of vesicular basalt or unidentified types of rock. One is a complete one-hand mano that was used not only for grinding but wear on one end indicated it also was used for pounding. Two other pieces are mano fragments. Another piece was a fragment of a metate with a well-worn trough, and another piece of indeterminate form might have been part of a metate. An uncommon form of ground stone artifact was a sphere about the size of a softball.

The rarer types of inventoried items include three small pieces of worked marine shell. One was half of a tinkler ornament, probably made from a cone shell (*Conus* sp.). Another fragment had ridges suggesting it was a scallop shell (*Pecten* sp. or *Argopecten* sp.). The third piece was a nondiagnostic fragment.

An average of 25 artifacts were found in each inventoried grid unit (6 artifacts per 100 square m), but the artifacts were distributed in a highly clustered pattern. The 6 grid units with the most artifacts had 41 percent of all the artifacts. No meaningful patterning of the spatial distribution of the various types of artifacts was detected.

A scatter of approximately 6 plain ware potsherds were found about 200 feet (60 m) east of the southern part of the basin, and a whole metate was found 65 feet (20 m) northeast of that sparse scatter. It was determined that those artifacts probably were deposited in that area in 2012 when about 1 foot (30 cm) of excess dirt, which had been excavated to expand a storm water retention basin in the southeastern part of the power plant parcel, was spread across the area. The only other artifact on the site surface was a metate fragment about 220 feet (67 m) east of the northern part of the fuel storage tank retention basin.

Archaeological Testing. To further explore the site, 13 test trenches, accumulating to 1,390 linear feet (424 m), were excavated with a backhoe equipped with a bucket 3 feet (0.9 m) wide. One segment of a trench 50 feet (15 m) long was excavated to a depth of 7 feet (2.1 m) and the rest were dug to depths of 4 to 5 feet (1.2 to 1.5 m).

Feature 1, Irrigation Canal. The single archaeological feature found by the testing is a canal approximately 5 feet (1.5 m) wide and 1 foot (30 cm) deep, a size that suggests it is a field lateral. The one exposure of the canal suggests it flowed to the west/northwest.

The canal had been excavated into Stratum VI, a layer of mottled brown to dark brown clay to loam. The bottom of the canal extended slightly below the bottom of the test trench, which was dug to a depth of 5 feet (1.5 m). The sediments on the north and south sides of the canal vary from dark brown to brown clay to sandy clay loam, and were designated Stratum Va. Those deposits probably accumulated in fields watered by the canal, but further investigation is needed to confirm that the Hohokam farmed the surrounding area. The ditch is filled with dark brown clay that was designated Stratum Vb. Scattered charcoal in Stratum V and the overlying Stratum IV, a brown to light brown silt loam, may represent burning of field stubble or weeds. The higher deposits in the soil column include Stratum III (overbank deposits that postdate the Hohokam occupation), Stratum II (plow zone), and Stratum I (zone of modern disturbance).

The cross section indicates the canal had a slight berm on the downslope (north) side and the canal alignment might have shifted slightly to the north over time. Clay fill in the canal indicates sluggish flow during most of the time the canal was in use. Silt loam in the higher fill of the canal indicates an increase in water velocity. Iron and manganese staining below the canal reflect anaerobic conditions due to prolonged standing water in the canal.

Three flakes and three sherds were found in the trench walls in association with the ditch and a Salado Polychrome sherd recovered from the dirt excavated from the trench suggests the canal probably dates to the Civano phase of the late Classic period. Pre-Classic period Hohokam or perhaps even pre-Hohokam archaeological deposits might be buried more deeply.

Recommendations: Site AZ U:9:311(ASM) appears to be the remnants of a Hohokam field that probably was farmed during the late Classic period Civano phase (circa A.D. 1300-1450) and perhaps as early as the Gila Butte phase of the Colonial period (circa A.D. 750). It is recommended that site AZ U:9:311(ASM) be considered eligible for the Arizona Register under Criterion D for its potential to yield important information about Hohokam agriculture and settlement of the Phoenix Basin. Because the canal feature

identified at the site is buried, horizontal exposure has potential to identify a network of field ditches, which have been documented only rarely at other Hohokam sites. Analyses of charred macrobotanical specimens, pollen, and biosilicates could identify what crops the Hohokam grew on the Salt River floodplain; radiocarbon dating has potential to determine when the Hohokam used the area; and study of the canal could yield information about its engineered characteristics such as flow rates, capacity, and amount of area that it could have watered.

The canal and adjacent field area are buried in the very northwestern corner of the power plant parcel, and it might be possible to design the proposed new facilities at the Ocotillo Power Plant to avoid disturbance of the area. If not, it is recommended that a plan be developed and implemented to recover information and artifacts from the area prior to any construction activity. Additional deeper testing of areas that would be disturbed by the proposed modernization of the power plant or archaeological monitoring of construction also is recommended to check for potential additional archaeological features and deposits and evaluate them and treat them appropriately.

The restricted distribution map on this page has been removed from this copy of the report.

EXHIBIT F – RECREATIONAL PURPOSES AND ASPECTS

Arizona Revised Statutes ("ARS") §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(4) stipulates "the proposed availability of the site to the public for recreational purposes, consistent with safety considerations and regulations" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> "*State the extent, if any, the proposed site or route will be available to the public for recreational purposes, consistent with safety considerations and regulations and attach any plans the applicant may have concerning the development of the recreational aspects of the proposed site or route.*"

The proposed Ocotillo Modernization Project (the "Project") is entirely located within the existing Ocotillo Power Plant site ("Ocotillo Site"). There are no anticipated adverse impacts on recreation as a result of the Project. Within the City of Tempe, the Ocotillo Site has been designated as industrial land use based on its current use. APS plans to maintain industrial uses of the Ocotillo Site by continuing to operate the power plant and associated facilities. The Ocotillo Site has no existing or planned designated recreation facilities and is not accessible for public recreation purposes.

EXHIBIT G – CONCEPTUAL DRAWINGS OF TYPICAL FACILITIES AND TRANSMISSION FACILITIES

Arizona Revised Statutes ("ARS") §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(7) stipulates "the technical practicability of achieving a proposed objective and the previous experience with equipment and methods available for achieving a proposed objective" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> *"Attach any artist's or architect's conception of the proposed plant or transmission line structures and switchyards, which applicant believes may be informative to the Commission."*

The illustrations on the following pages represent conceptual design information for the Ocotillo Site facilities and transmission line structures.

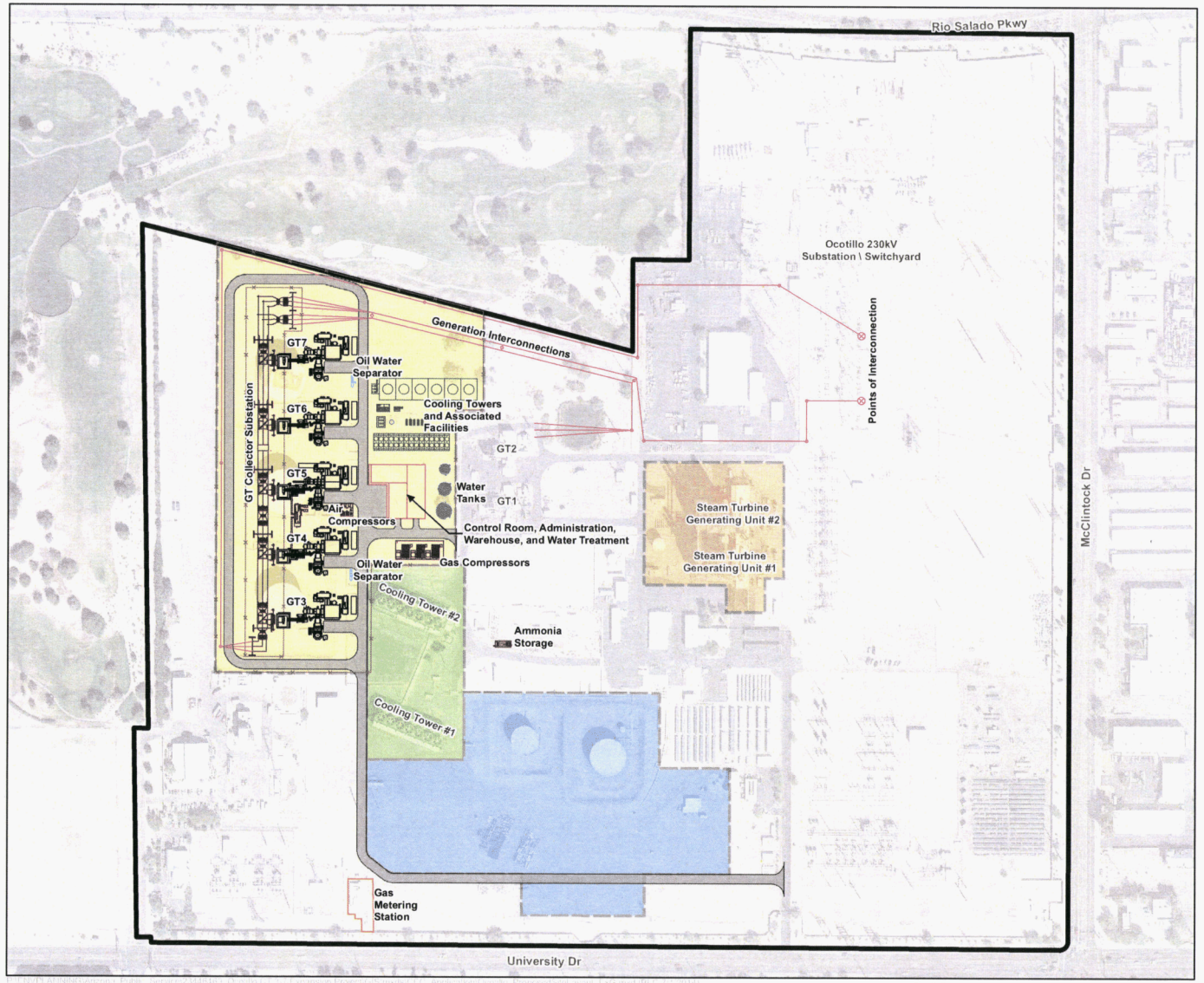


Figure G-1

Proposed Site Layout

Ocotillo Modernization Project

Legend

- Existing Ocotillo Power Plant

Proposed Site Layout

- Proposed GT
- Control Room, Administration, Warehouse, and Water Treatment
- Cooling Towers and Associated Facilities
- Oil Water Separator
- Generation Interconnections
- Gas Metering Station
- Water Tanks
- Plant Features
- Fence

Primary Construction

- Temporary Construction Offices, Laydown and Parking Areas
- Main Construction Area for New Generating Units
- Cooling Towers Removal Area
- Steam Turbine Generating Unit Removal Area
- Internal Access Road

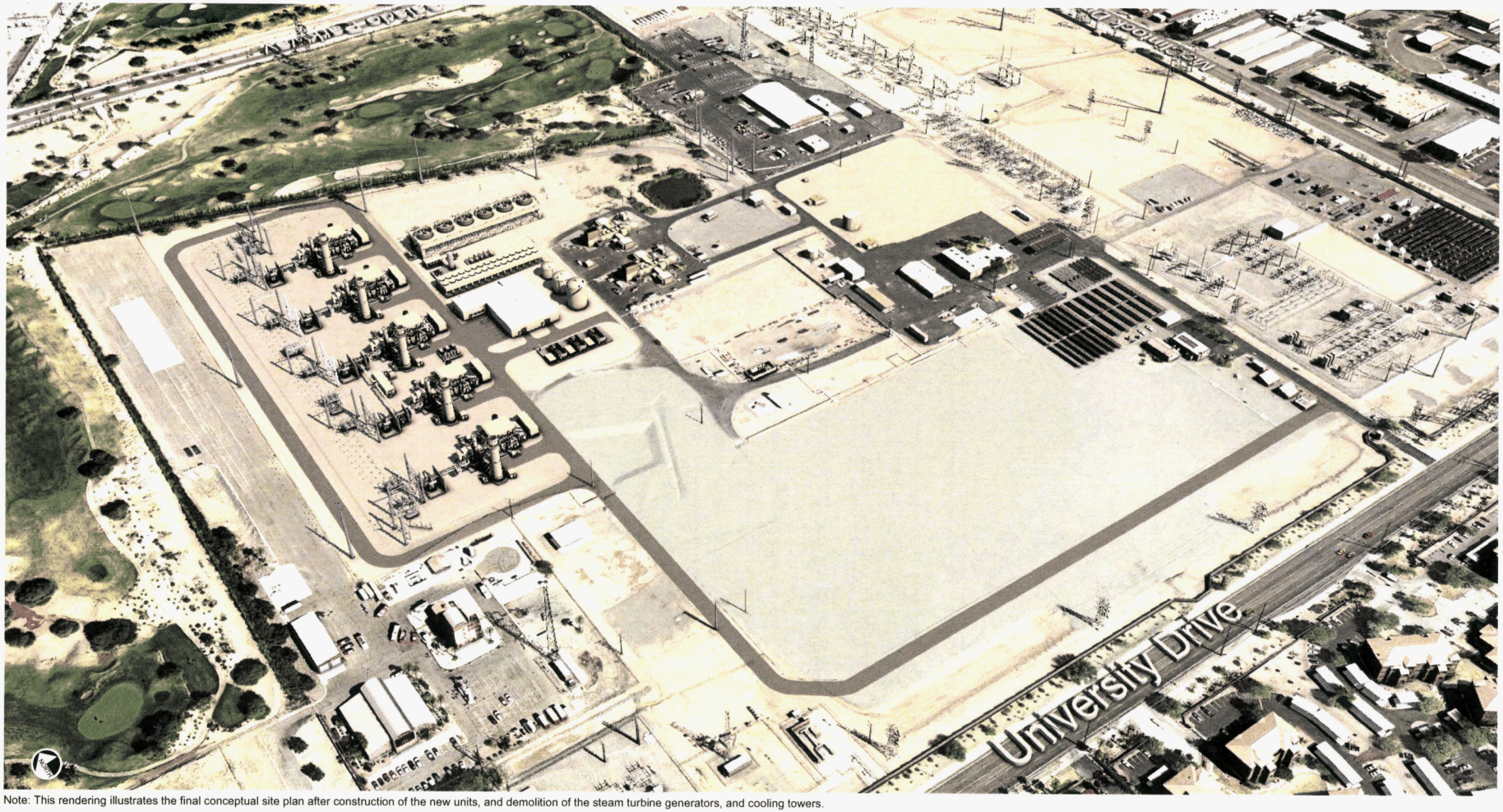
GT = Gas Turbine Generator

Source:
Project Features: APS 2013 - 2014
Base Map: ADOT 2014
Imagery: FCDMC 2012

N

0 150 300
Feet
1:3,600

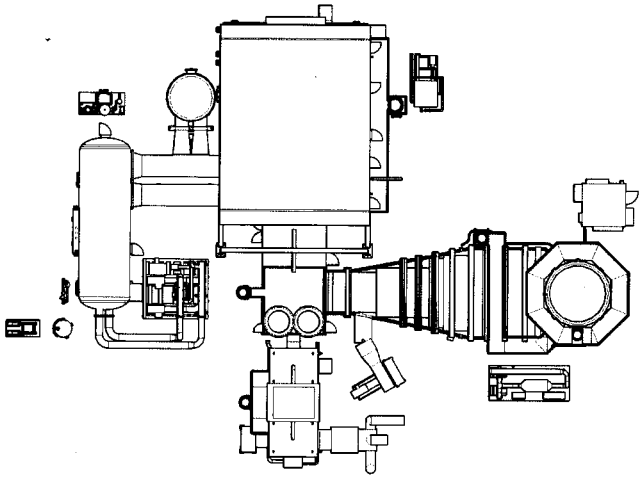
aps



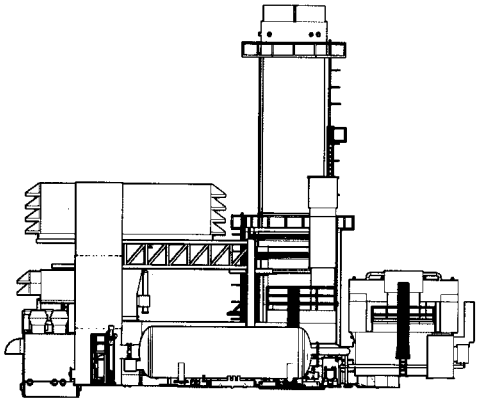
Note: This rendering illustrates the final conceptual site plan after construction of the new units, and demolition of the steam turbine generators, and cooling towers.

Conceptual Site Plan
Figure G-2

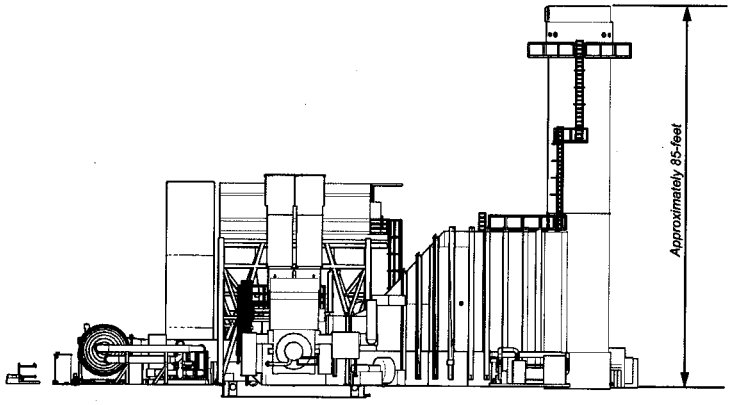
aps



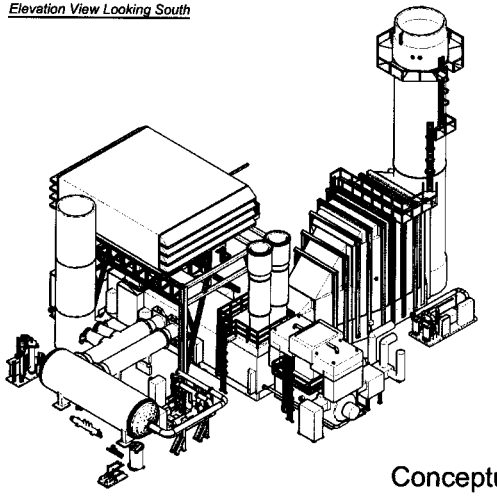
Top View



Elevation View Looking South



Elevation View Looking East



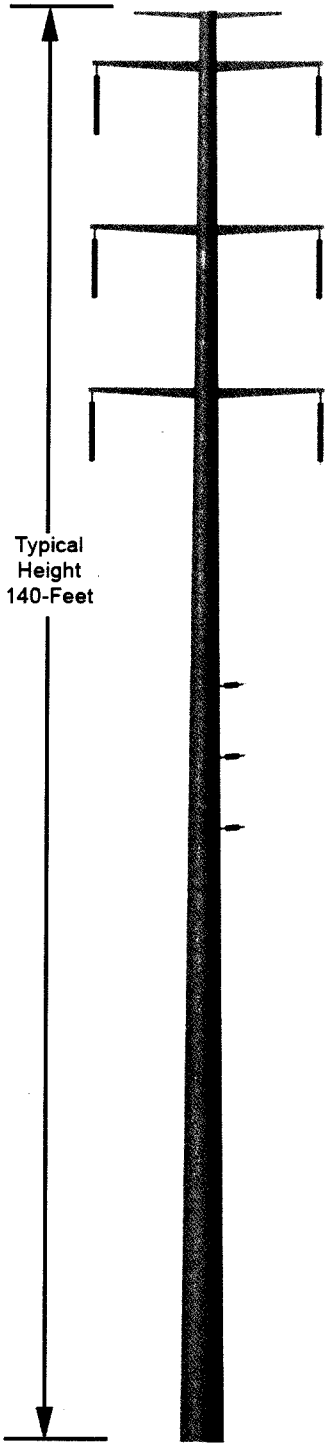
Isometric View

Source:
3D Model: Kiewit

Conceptual Equipment Detail
(Typical GT - Plan and Profile)

Figure G-3

aps



NOT TO SCALE

Figure G-4 – Typical Double-Circuit 230kV Tangent Pole with Single-Circuit 69kV

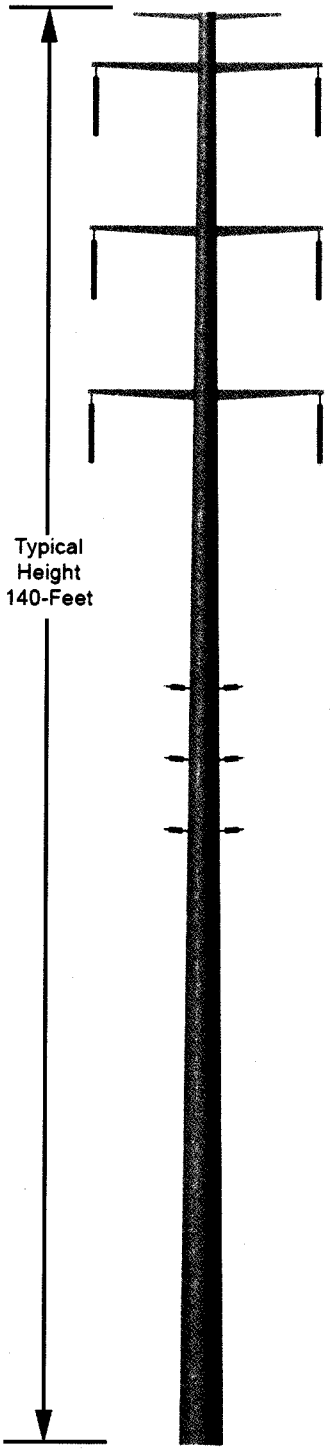


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Figure G-5 – Typical Double-Circuit 230kV Tangent Pole with Double-Circuit 69kV

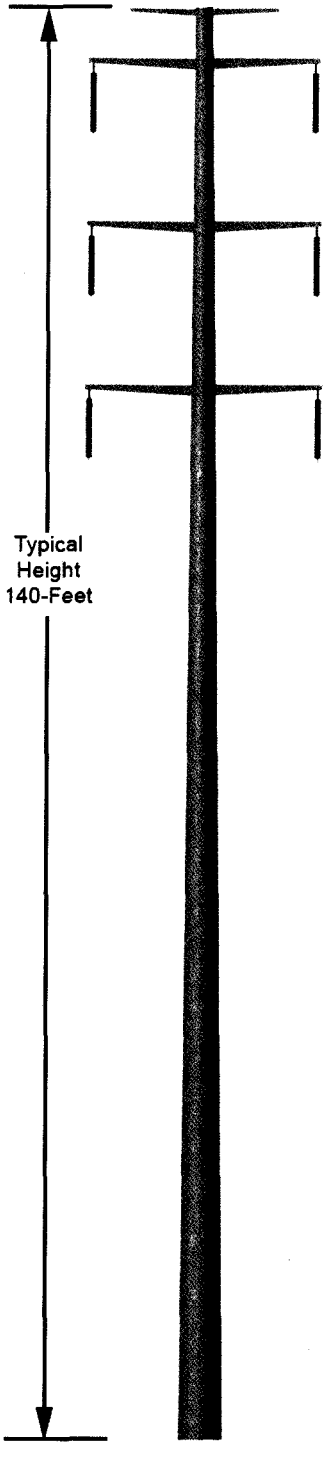

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Figure G-6 – Typical Double-Circuit 230kV Tangent Pole

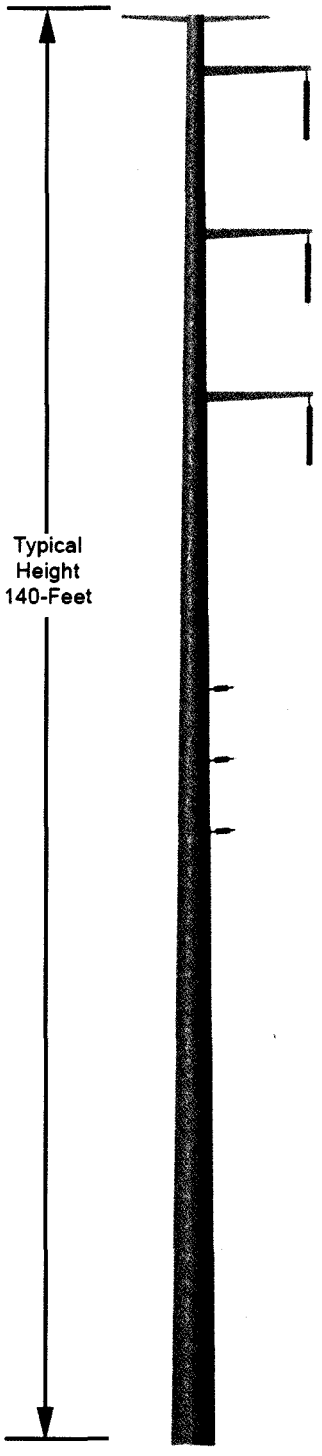

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Figure G-7 – Typical Single-Circuit 230kV Tangent Pole with Single-Circuit 69kV

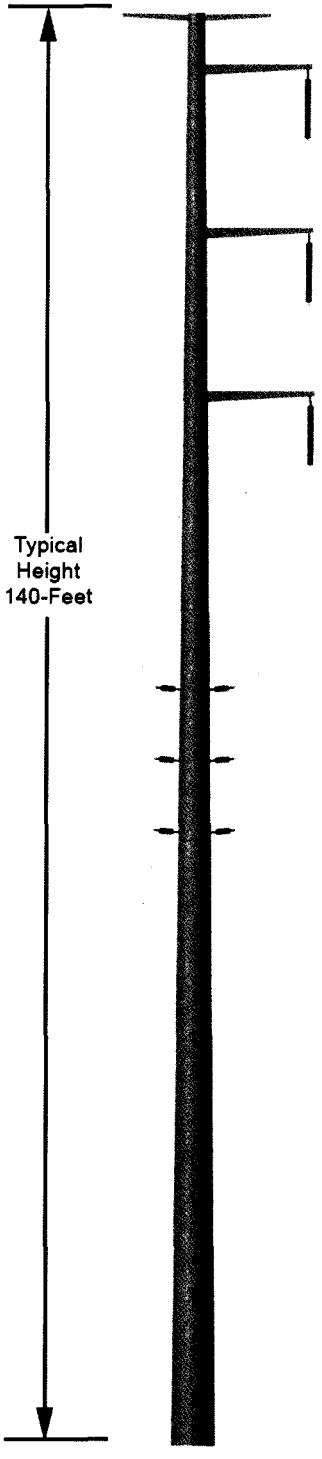

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Figure G-8 – Typical Single-Circuit 230kV Tangent Pole with Double-Circuit 69kV

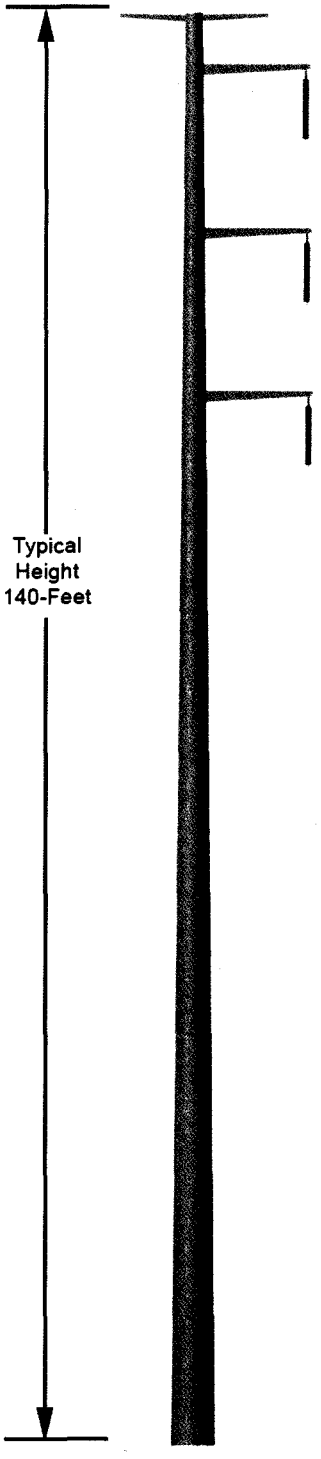

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Figure G-9 – Typical Single-Circuit 230kV Tangent Pole

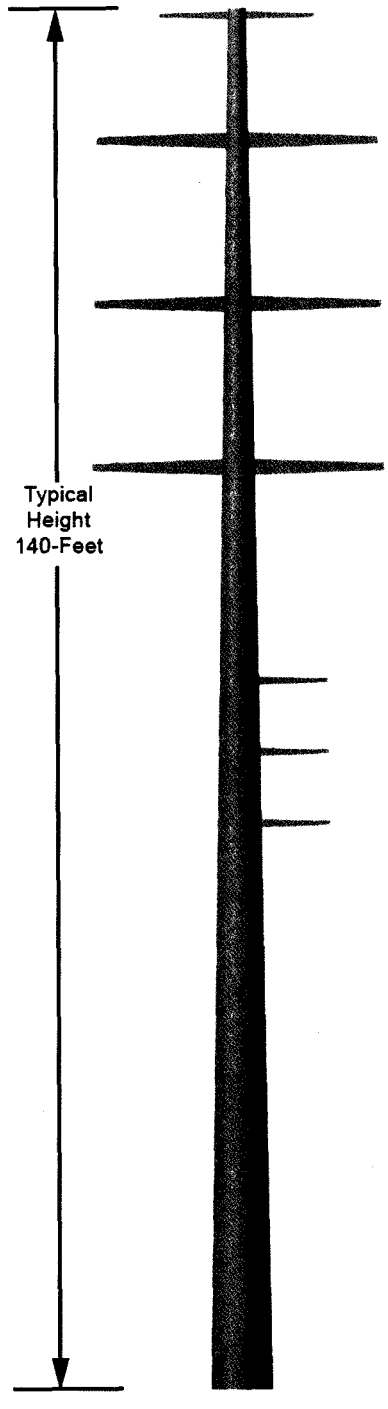

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Figure G-10 – Typical Double-Circuit 230kV Dead-End Pole with Single-Circuit 69kV

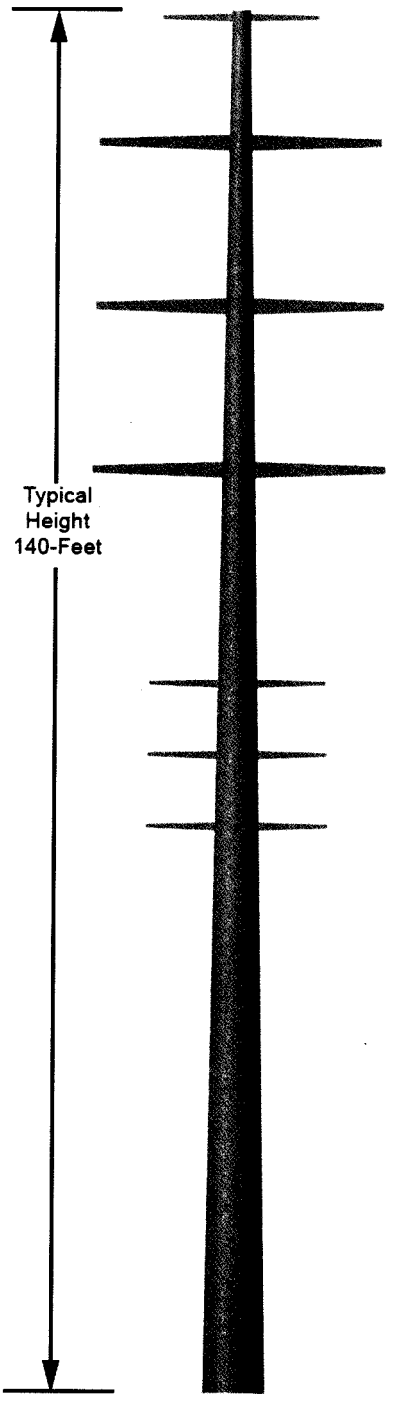

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Figure G-11 – Typical Double-Circuit 230kV Dead-End Pole with Double-Circuit 69kV

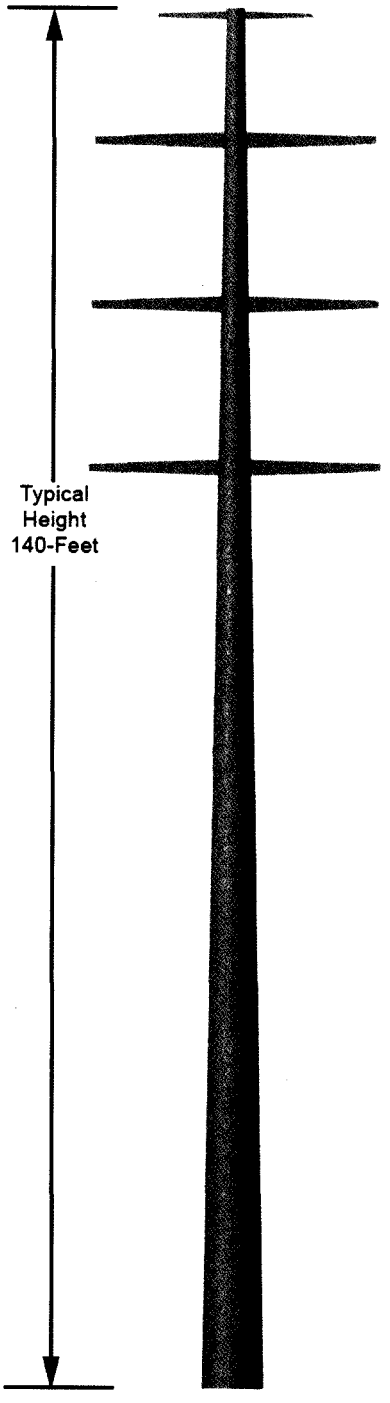

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Figure G-12 – Typical Double-Circuit 230kV Dead-End Pole

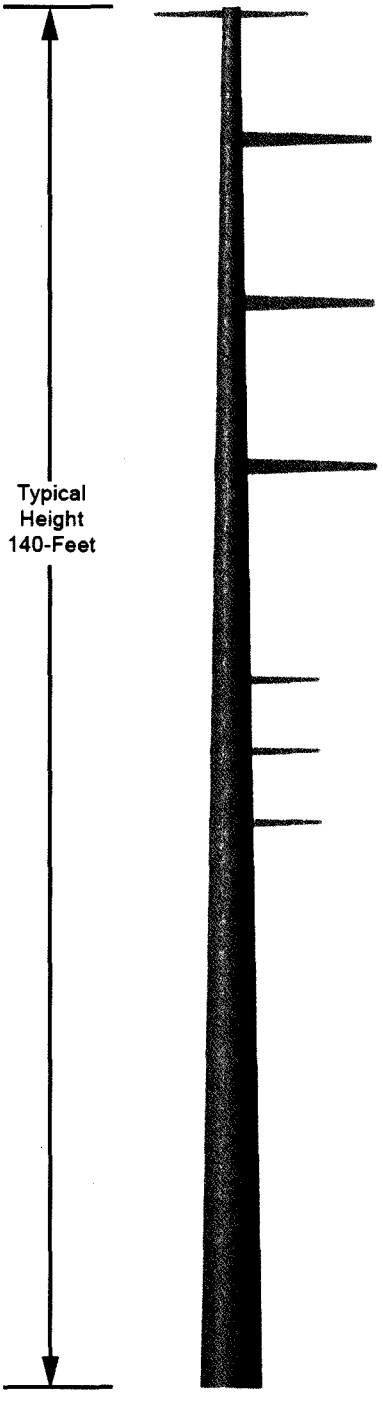

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Figure G-13 – Typical Single-Circuit 230kV Dead-End Pole with Single-Circuit 69kV

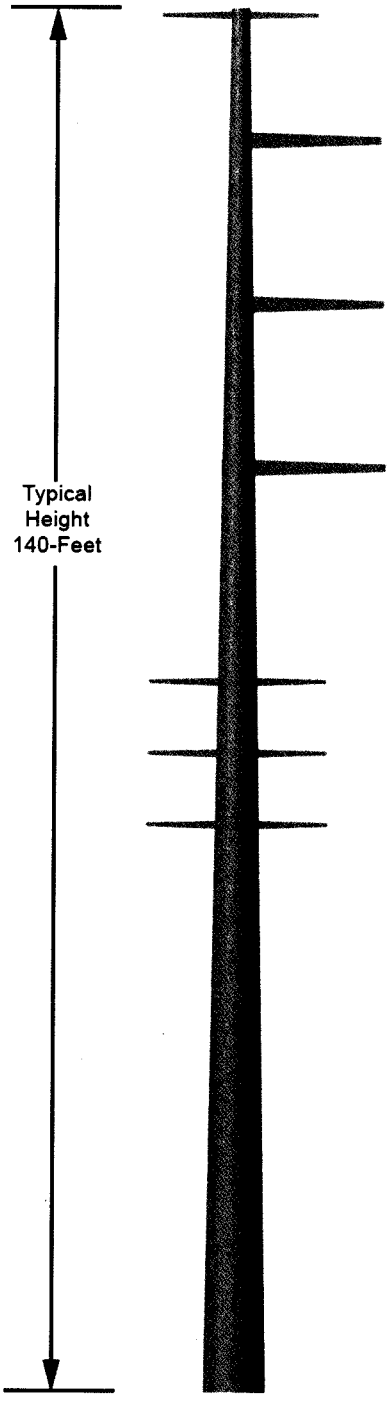

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Figure G-14 – Typical Single-Circuit 230kV Dead-End Pole with Double-Circuit 69kV

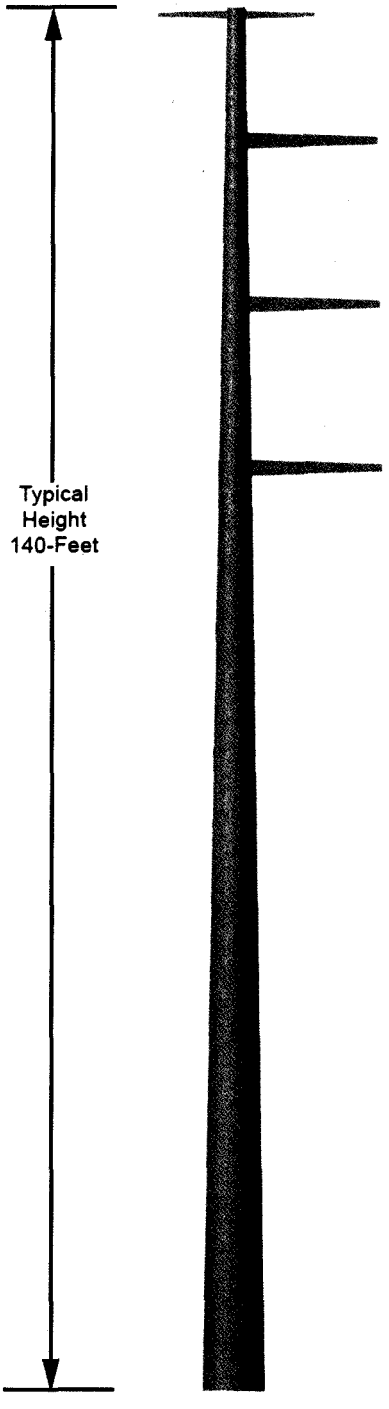

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Figure G-15 – Typical Single-Circuit 230kV Dead-End Pole

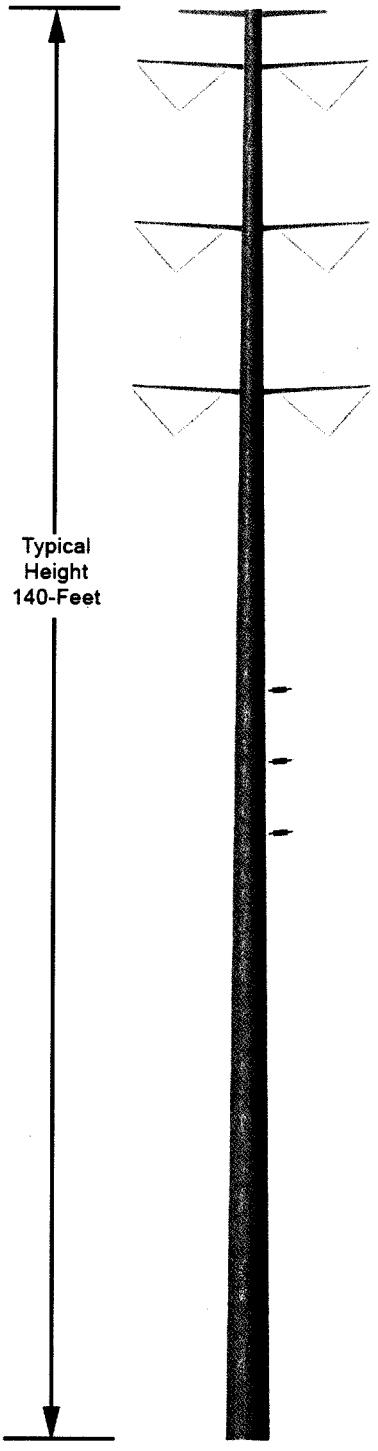

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Figure G-16 – Typical Double-Circuit 230kV (V-String) Tangent Pole with Single-Circuit 69kV

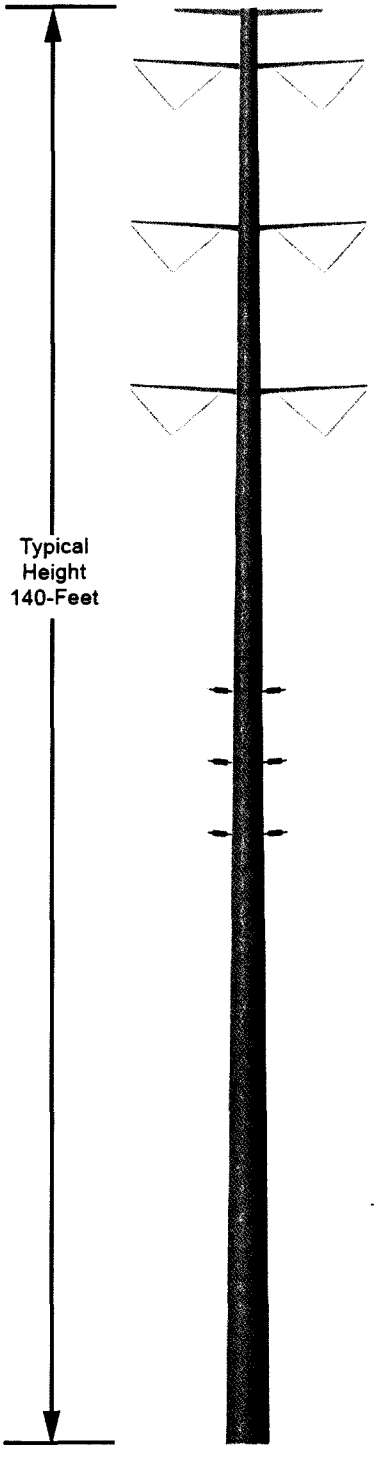

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Figure G-17 – Typical Double-Circuit 230kV (V-String) Tangent Pole with Double-Circuit 69kV

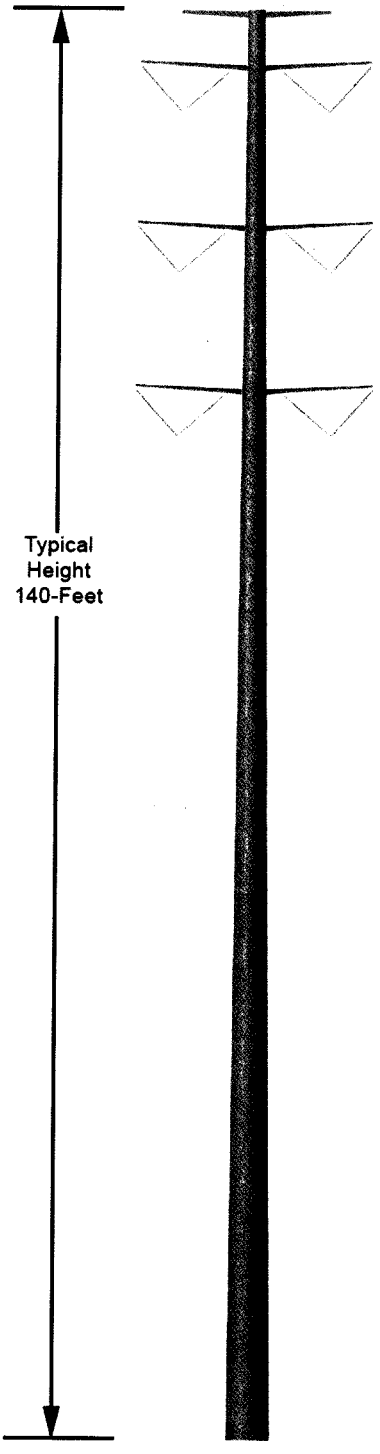

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Figure G-18 – Typical Double-Circuit 230kV (V-String) Tangent Pole

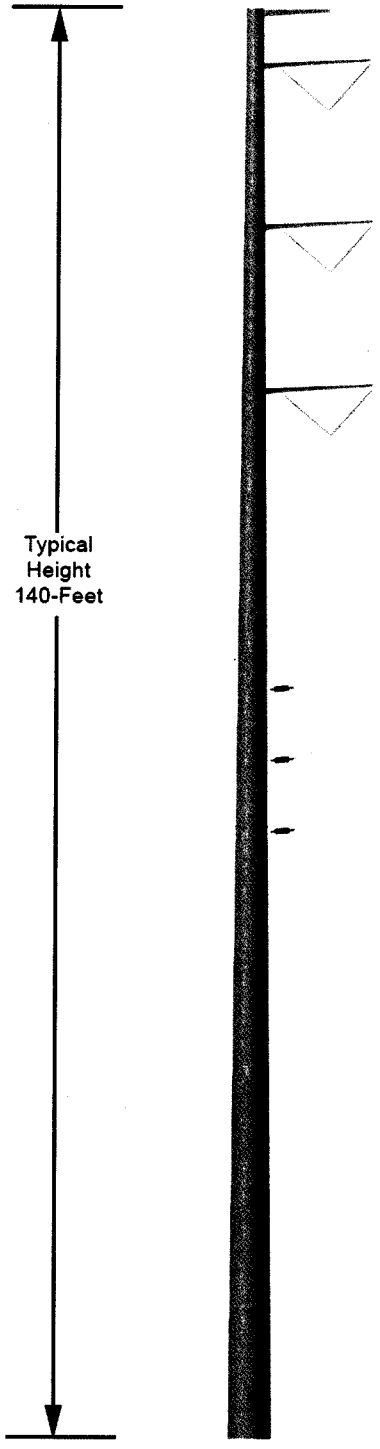

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Figure G-19 – Typical Single-Circuit 230kV (V-String) Tangent Pole with Single-Circuit 69kV

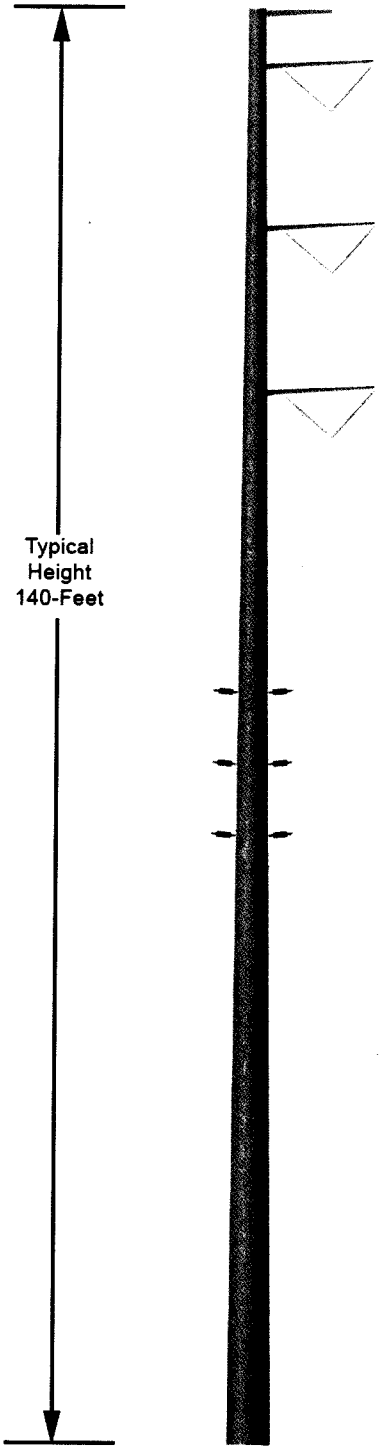

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Figure G-20 – Typical Single-Circuit 230kV (V-String) Tangent Pole with Double-Circuit 69kV

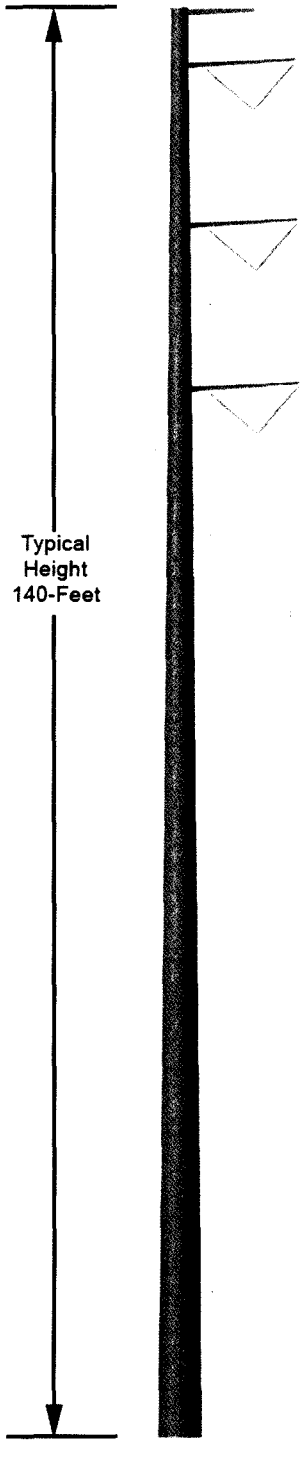

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Figure G-21 – Typical Single-Circuit 230kV (V-String) Tangent Pole

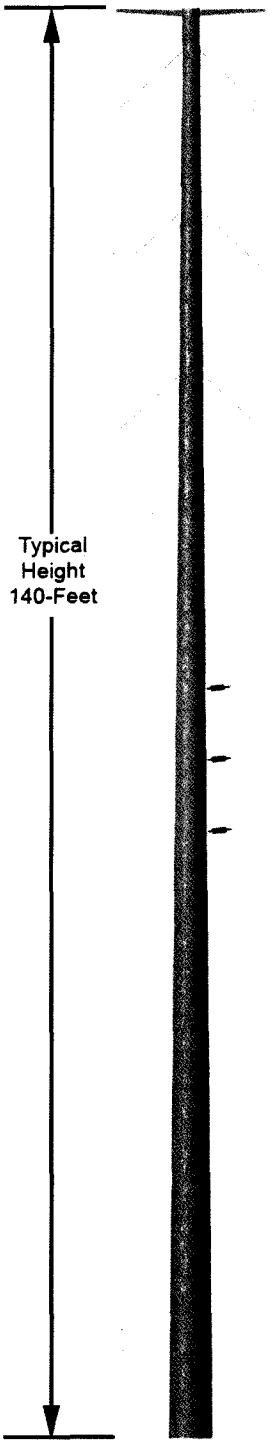

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Figure G-22 – Typical Double-Circuit 230kV (Braced Post) Tangent Pole with Single-Circuit 69kV

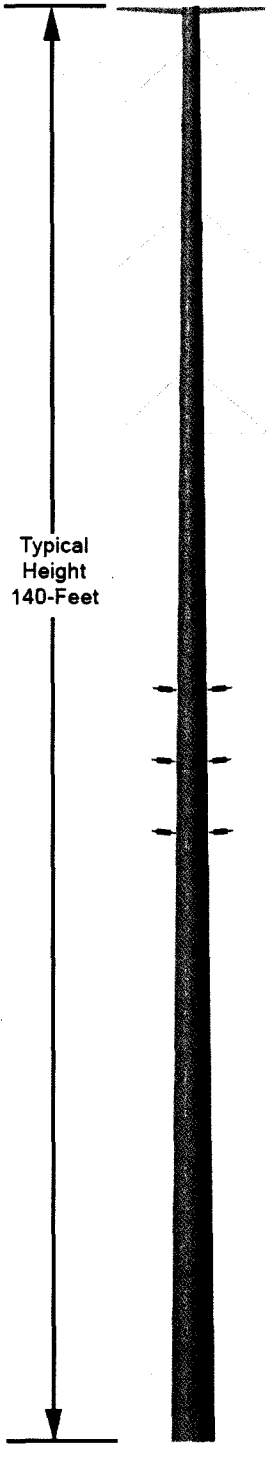

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Figure G-23 – Typical Double-Circuit 230kV (Braced Post) Tangent Pole with Double-Circuit 69kV

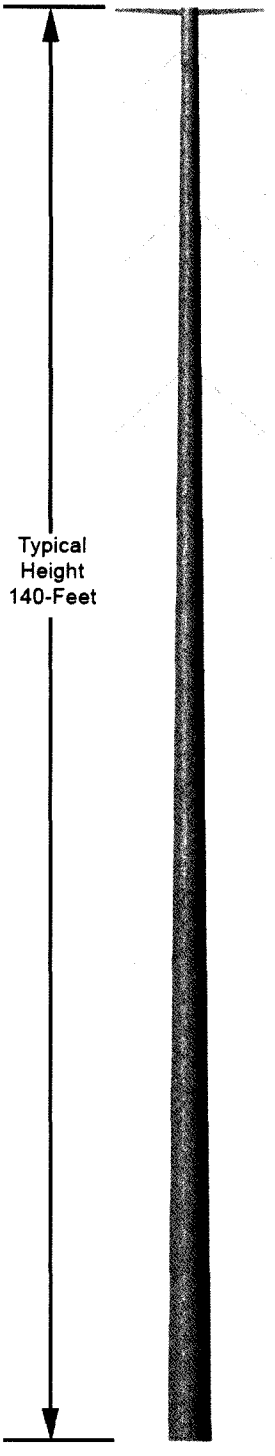

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Figure G-24 – Typical Double-Circuit 230kV (Braced Post) Tangent Pole

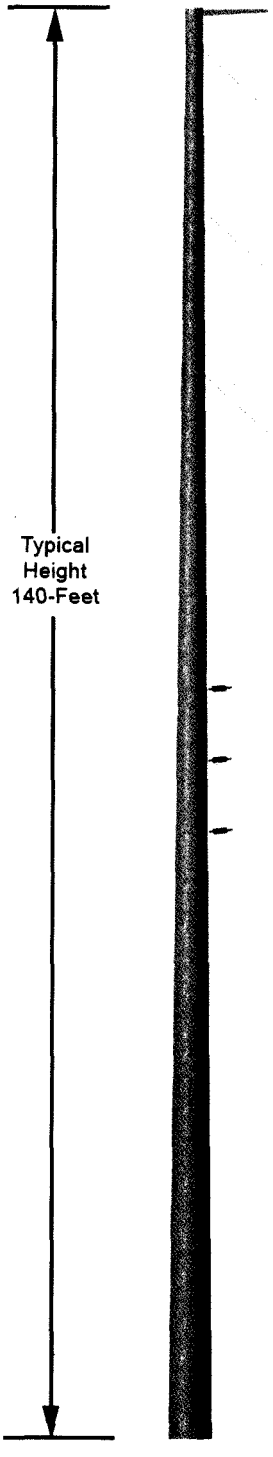

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Figure G-25 – Typical Single-Circuit 230kV (Braced Post) Tangent Pole with Single-Circuit 69kV

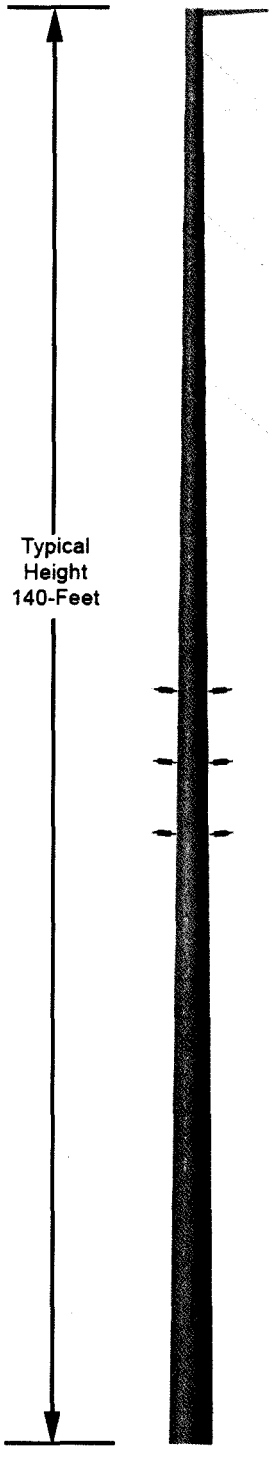

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Figure G-26 – Typical Single-Circuit 230kV (Braced Post) Tangent Pole with Double-Circuit 69kV

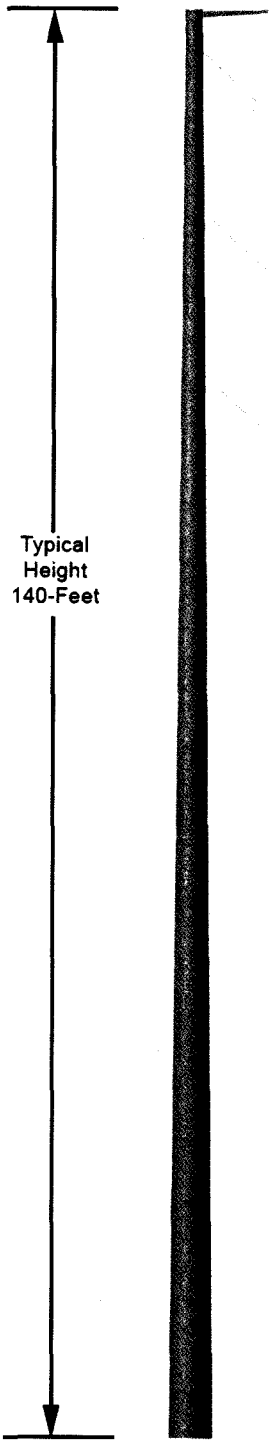

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Figure G-27 – Typical Single-Circuit 230kV (Braced Post) Tangent Pole

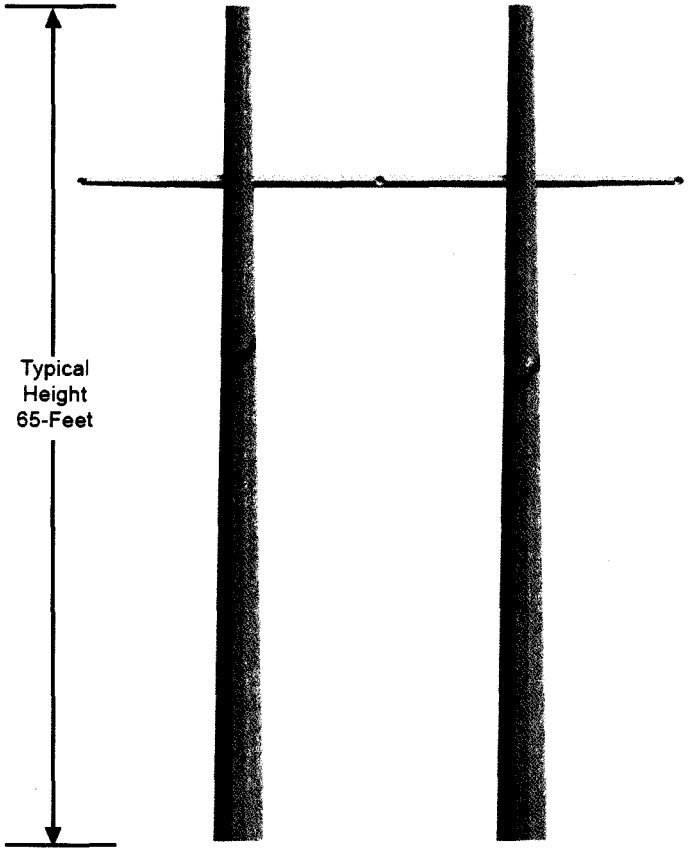

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Figure G-28 – Typical Single-Circuit 230kV H-Frame Structure

EXHIBIT H – EXISTING PLANS

Arizona Revised Statutes ("ARS") §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(1) stipulates "existing plans of the state, local government and private entities for other developments at or in the vicinity of the proposed site" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> *"To the extent applicant is able to determine, state the existing plans of the state, local government and private entities for other developments at or in the vicinity of the proposed site or route."*

EXISTING PLANS OVERVIEW

The review of existing and future land uses conducted for the Ocotillo Modernization Project ("Project") is described in Exhibit A. As part of the land use review, general plans were gathered for the study area, which includes the existing Ocotillo Power Plant ("Ocotillo Site") and areas within 2 miles. General plans were acquired and reviewed from the cities of Tempe, Scottsdale, Mesa, Phoenix, the Salt River Pima-Maricopa Indian Community (SRPMIC), and Maricopa County. Based on the jurisdiction (and ownership) of lands adjacent to and within close proximity to the Ocotillo Site, APS and URS met with representatives from the City of Tempe and Arizona State University to confirm information gathered from their plans and also to identify specific known future development plans. Planners for Mesa, Scottsdale, Phoenix, SRPMIC, and Maricopa County also were contacted to discuss the Project and identify known future development plans. Information related to specific future development plans was compiled for areas within the vicinity, approximately 1 mile, of the Ocotillo Site based on the density of development within the surrounding area. Figure H-1 denotes 30 developments occurring within 1 mile of the Ocotillo Site.

Future Developments – Final Permitting and Construction Phase

Figure H-1 depicts the locations of thirteen (13) future developments that are in review for a building permit, under construction, or have received their final permit for occupancy.

Final Permitting/Certificate of Occupancy – West of the Ocotillo Site, Zipps Sports Grill obtained their certificate of occupancy for a restaurant along Mill Avenue.

Construction Underway – The Residences at University Center is located immediately west of Dorsey Lane, across the street from the Tempe/APS Joint Fire Training Center. The multi-family housing development will be three and four stories tall and include approximately 300 apartments. West of the Ocotillo Site, the State Farm at Marina Heights development will be the insurance company regional headquarters and will accommodate office, dining, retail, and plaza space. Hayden Ferry Lakeside and Sun Devil Marketplace are both mixed-use, commercial, office, and retail developments located west of the site. The ASU Annex development will accommodate two new restaurants Postino and Snooze. University House is a mixed-use development that will accommodate 72 residential units and other commercial uses. North of the Ocotillo Site, the Camden Tempe multi-family residential development will accommodate up to 234 units. East of the Ocotillo Site, the development Liberty Center at Rio Salado will include six (6) office buildings totaling over 800,000 square feet. 1010 Lemon Street is a mixed-use development located south of the Ocotillo Site and will accommodate 213 multi-family residential units, commercial, and a parking garage.

In Plan Review for Building Permit – The Lofts at Hayden Ferry Lakeside is a multi-family residential development that will include up to 264 units. North of Loop 202, the Bella Vita Townhomes will be a single family residential development with 18 units. The Standard on Broadway development will accommodate mixed use and 194 residential units located south of the Ocotillo Site.

Future Developments – Preliminary Planning Phase

Seventeen (17) future developments that are under preliminary site plan review or plans have been approved/fully entitled also are shown on Figure H-1.

Plans Approved/Entitled – The Villas at Southbank will be an assisted living facility and mixed-use complex would be located on adjacent parcels bordering Tempe Town Lake and City of Tempe owned vacant land immediately north of the Ocotillo Site. The entitled mixed-use complex will likely be a commercial building and the assisted living facility will accommodate 262 dwelling units, a restaurant, and other facility amenities. Per communications with the City of Tempe, the adjacent vacant parcels owned by the City of Tempe (also along Tempe Town Lake) are not under development and future plans for development are unknown. Tempe Town Lake Residential will be a multi-family residential complex, located west of the Ocotillo Site, and will accommodate 290 units. Other fully entitled projects east of the Ocotillo Site include the Hayden Lane Townhomes, 3 single family units, and the Apache Villas; Apache Villas will accommodate 76 residential units and other mixed-uses. South of the Ocotillo Site, fully entitled developments include Kenneth Place Townhomes, Jentilly Condos, and the Grove. Kenneth Place Townhomes will include 8 single family residences. The multi-family residential development at Jentilly Condos will accommodate 33 residential units and 326 residential units at the Grove residential development.

Preliminary Site Plan Review – LPC at Southbank will be a senior housing residential development that will accommodate 358 residential units located west of the Ocotillo Site. USA Place will be a mixed-use development for a hotel and educational facilities. The Alec Warren and Mill + Rio developments plan for mixed use residential and retail units. The AC Tempe by Marriot will be a hotel with 159 rooms. Tempe Market Place East development includes two hotels and is under preliminary site plan review. Projects under preliminary site plan review include Hayden @ Dorsey Station, the Terraces, and Dorsey Lane Townhomes. The Hayden @ Dorsey Station proposes a mixed-use complex which will include 358 residential units and other retail units. The Terraces will accommodate several uses including residences, retail, parking, and other mixed uses. Dorsey Lane Townhomes will be a multi-family residential development that will include 54 units.

CONCLUSION

Impacts are anticipated to be minimal because the existing Ocotillo Site is already an operational power plant within its industrial land use designation. The Project would be compatible with future developments in the vicinity of the Ocotillo Site.

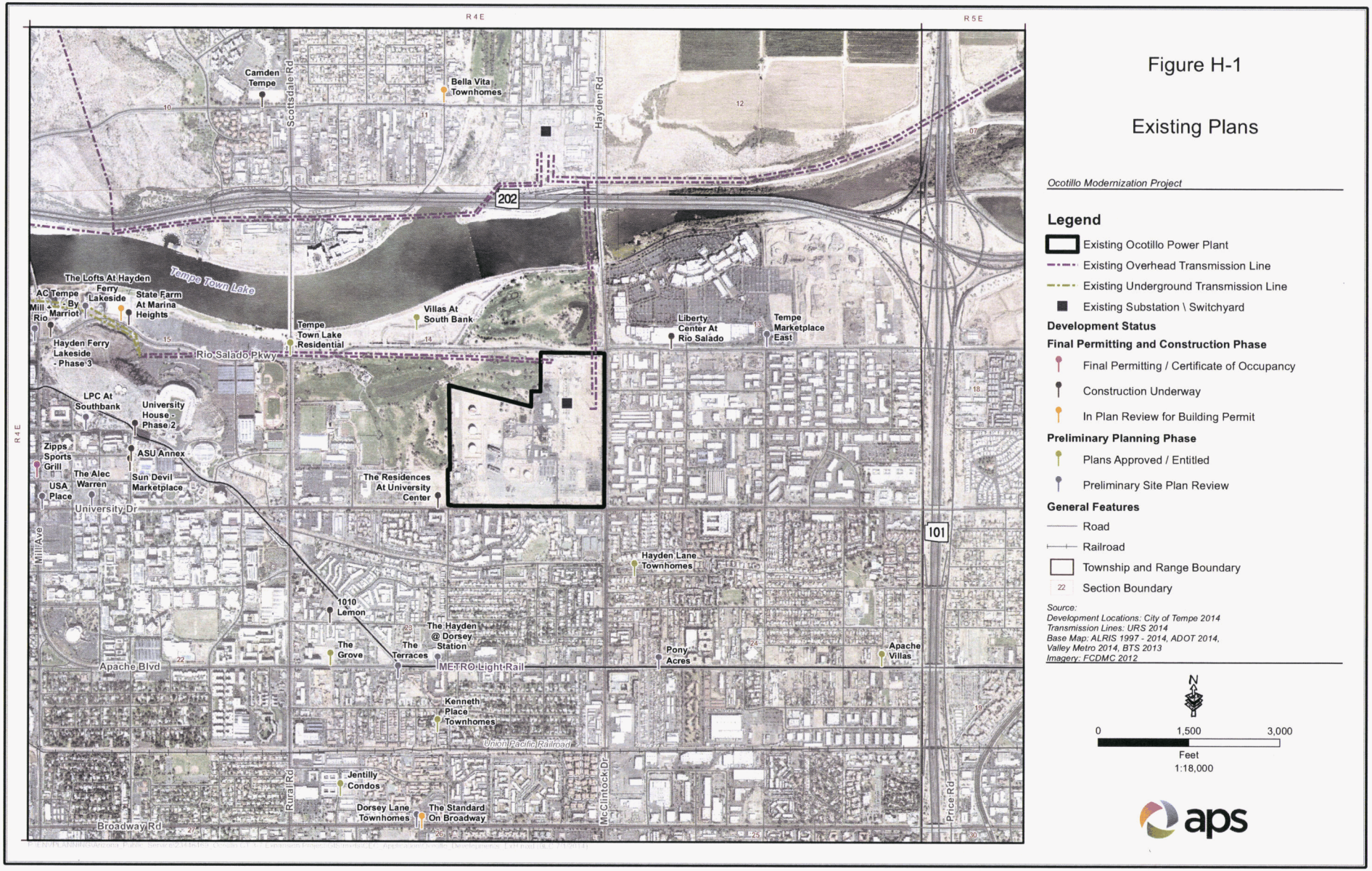

Figure H-1

Existing Plans

Ocotillo Modernization Project

Legend

- Existing Ocotillo Power Plant
- Existing Overhead Transmission Line
- Existing Underground Transmission Line
- Existing Substation \ Switchyard

Development Status

Final Permitting and Construction Phase

- Final Permitting / Certificate of Occupancy
- Construction Underway
- In Plan Review for Building Permit

Preliminary Planning Phase

- Plans Approved / Entitled
- Preliminary Site Plan Review

General Features

- Road
- Railroad
- Township and Range Boundary
- 22 Section Boundary

Source:
Development Locations: City of Tempe 2014
Transmission Lines: URS 2014
Base Map: ALRIS 1997 - 2014, ADOT 2014, Valley Metro 2014, BTS 2013
Imagery: FCDMC 2012

N

0 1,500 3,000
Feet
1:18,000

aps

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_____. 2014. Personal Communication, Arizona State University, John Creer on May 21, 2014.

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EXHIBIT I – ANTICIPATED NOISE/INTERFERENCE WITH COMMUNICATION SIGNALS

Arizona Revised Statutes ("ARS") §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(3) stipulates "noise emission levels and interference with communication signals" are among the factors the Siting Committee must consider in reviewing Certificate of Environmental Compatibility ("CEC") applications. As stated in Arizona Administrative Code R14-3-219:

> *"Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities."*

INTRODUCTION

The following assessment of environmental noise effects considers the following:

1. Current operations (i.e., two [2] existing steam units and two [2] GT units) while the five (5) new LMS100 GT units would be under construction.

2. Expected 2018 operations, at which time operations would be characterized by as many as five (5) LMS100 GT units and the existing pair of GT units. The steam turbine[1] units would be decommissioned and not operating.

Preceding the presentation of baseline sound levels measured on the 126-acre Ocotillo Power Plant parcel ("Ocotillo Site"), and the predictive analysis of noise emission associated with the aforementioned scenarios, the following Results Summary section highlights key findings and conclusions. A subsequent section on acoustical terminology and concepts is offered to help the reader better understand this Exhibit I noise-related portion of the CEC.

RESULTS SUMMARY

Predicted Project construction noise levels may temporarily exceed the applicable 60 dBA daytime threshold for some months of the construction schedule, but activities causing these temporary elevated noise levels could be permitted given prior written approval and/or during allowable construction process hours.

In general, Project operation noise levels will be similar to, or less than, noise from existing plant operations and would comply with the City of Tempe requirements under a variety of anticipated scenarios and conditions. With respect to anticipated Project operations, four scenarios were considered in this noise analysis:

- "Steady-state" operation of all seven GT units (two existing and five new);
- "Steady-state" operation of the five new GT units and the existing north GT unit, while the existing south GT unit ramps-up to "steady-state" operation;

[1] "Steam" will be used in this Exhibit I to represent "steam turbine", while "ST" will stand for "short-term" sound measurement.

- "Steady-state" operation of the five new GT units and the existing south GT unit, while the existing north GT unit ramps-up to "steady-state" operation; and
- "Steady-state" operation of only the five new GT units, with the existing GT pair offline.

Given the faster ramp-up (a.k.a., start-up) times and newer technology associated with the proposed GE LMS100 GT units, as compared to the existing GT units, this analysis assumes the start-up noise of a new GT is quieter than the start-up noise of an existing GT and would be shorter in duration; hence, only existing GT start-up noise has been considered in this analysis. Predicted noise from anticipated Project operations for all four of these above scenarios would be expected to be compliant with, based on Section 20-4.9 of the Tempe Code, a daytime threshold of 65 dBA L_{eq} at the exterior of occupied residences. The nighttime threshold of 55 dBA L_{eq} could also be met, assuming residential receiver windows and doors are closed. Such fenestration closures are subject to the influence of seasonal environmental conditions and, ultimately, dwelling occupant choice.

At all four nearest representative residential receivers considered in this analysis, predicted noise from these above four scenarios of anticipated Project operations noise is expected to be less than that of existing operations involving start-up noise of either existing steam turbine unit. At three of the studied receiver locations, on which there are existing residential-type land uses, the combined "steady-state" operation noise from all seven GTs is expected to be 1 to 3 dBA less than the noise from combined existing "steady-state" operation of both steam turbines and the GT pair. At the fourth receiver location, a future residential-type land use closest to the five new GT units, the anticipated noise from all seven "steady-state" operating GT units would be greater than existing "steady-state" operations (i.e., both steam turbines and both GT units) by less than 2 dBA—a barely detectable difference by a listener with average healthy human hearing.

Furthermore, because nearby roadway traffic noise alone is estimated to be several decibels over the 65 dBA L_{eq} threshold for three of the four identified nearest noise-sensitive receivers, such audible differences and measurement of Project operation noise compliance in an interior dwelling space under such conditions could be very difficult to discern, as ambient sound containing road and commercial aircraft traffic noise would likely mask Project noise to some degree.

ACOUSTICS FUNDAMENTALS

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the given environmental setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a fluid medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of the sound and is measured in Hertz ("Hz"), while intensity describes the sound's loudness and is measured in decibels ("dB"). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above approximately 110 dB begin to be felt inside the human ear as discomfort and eventually pain at 120 dB and higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dB. A 3 to 5 dB change is readily

perceived. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or if -10 dB, halving) of the sound's loudness.

Due to the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically; however, some simple rules are useful in dealing with sound levels. First, if a sound's amplitude is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Sound level is usually expressed by reference to a known standard. In expressing sound pressure level ("SPL") on a logarithmic scale, the sound pressure is compared to a reference value of 20 micropascals (μPa). SPL depends not only on the sound power ("PWL") of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source.

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. When the drum skin vibrates 100 times per second it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment consist of multiple frequencies that differ in amplitude. The method commonly used to quantify such sounds consists of evaluating a range or spectrum of frequencies according to a weighting system that reflects average healthy human hearing sensitivity, which tends to be best in the mid-range frequencies usually associated with speech but poorer at the low and high frequency extremes. This weighting system, applied as standardized decibel adjustments for each one-third or full octave band that makes up the audible spectrum, is called "A-weighting," and the decibel level measured is called the A-weighted sound level ("dBA"). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the dBA may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) may be used to describe sound that is changing in level. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the acoustic energy contained in the fluctuating sound level being measured over the specified time period. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum (L_{max}) and minimum (L_{min}) instantaneous level indicators that represent the root-mean-square maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location.

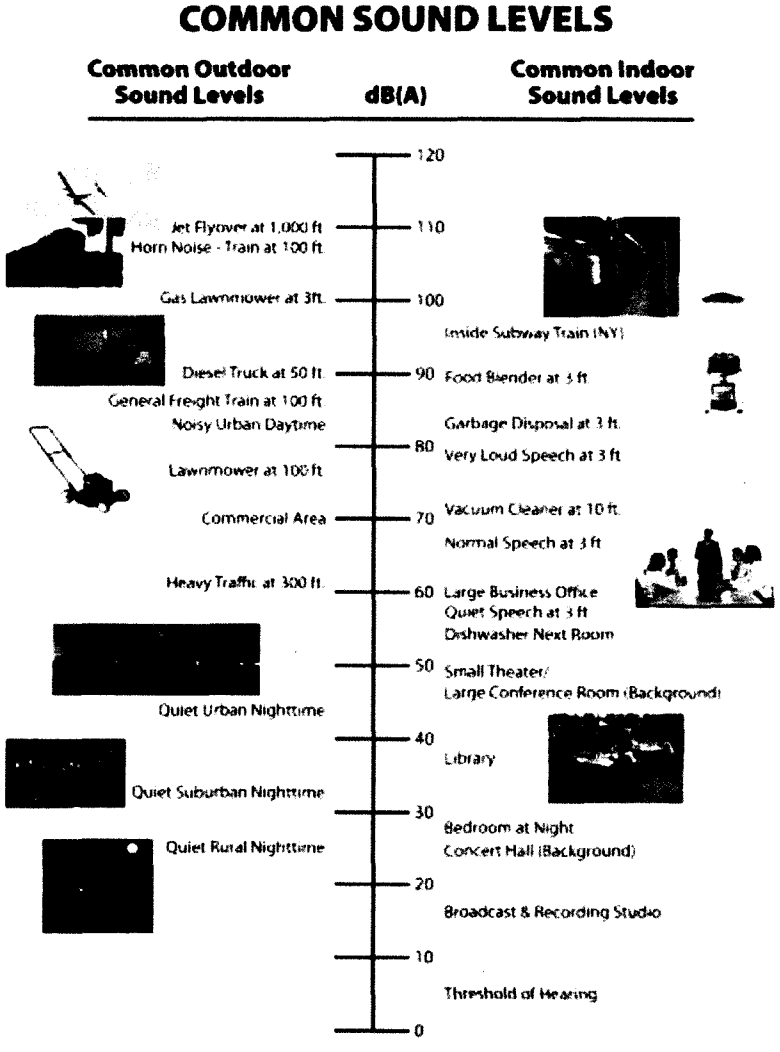
To describe the time-varying character of environmental noise, statistical noise descriptors L_{10}, L_{50}, and L_{90} are commonly used. They are the noise levels equaled or exceeded ten percent (10%), fifty percent (50%), and ninety percent (90%) of the measured time interval, respectively. Sound levels associated with the L_{10} typically describe transient or short-term events, half of the sounds during the measurement interval are softer than L_{50} and half are louder, while levels associated with L_{90} often describe background noise conditions and/or continuous, "steady-state" sound sources. By way of example, the din of background sound (e.g., indistinguishable traffic noise from a network of nearby roadways and building mechanical systems) measured at a receiver location would reasonably be represented by the L_{90} value,

while momentary louder sound from occasional commercial jets passing overhead during the measurement period (e.g., a continuous hour) would probably exhibit a much higher L_{10} value.

Finally, another sound measure known as the Day-Night Average Sound Level (L_{dn}) is defined as the A-weighted average sound level for a continuous 24-hour day. As part of its derivation from hourly or representative daytime and nighttime SPL, the calculation of L_{dn} applies a 10 dB penalty to hourly sound levels during the nighttime period (10:00 p.m. to 7:00 a.m.), which helps compensate for apparent increased human sensitivity to noise during these quieter nighttime hours.

The L_{dn} value is typically used to define acceptable land use compatibility with respect to noise. Because of the time-of-day penalties associated with the L_{dn} descriptor, the L_{eq} for a continuously operating sound source during a 24-hour period will be numerically less. Sound levels of typical noise sources and environments are provided in Figure I-1 to provide a frame of reference.

Figure I-1. Sound Pressure Levels of Typical Noise Sources and Noise Environments



Source: IDOT (2014)

EXISTING SOUND LEVELS

This section describes the existing noise environment on site and in the vicinity of the Project. Surrounding noise-sensitive receivers that may be affected by the Project are also identified.

Project Area

The major noise-producing components of the Project, both existing and proposed, are located within the boundaries of the current Ocotillo Site bordered by East University Avenue to the south, South McClintock Drive to the east, the Tempe/APS Joint Fire Training Center and Arizona State University ("ASU") Karsten Golf Course to the west, and East Rio Salado Parkway to the north (see Figure I-2).

Some land uses are considered sensitive to noise. Residences, hospitals, libraries, schools, places of worship, or other facilities, where quiet is an important attribute of the environment, are commonly considered to be noise-sensitive land uses. With respect to the Project vicinity, such nearest noise-sensitive land uses likely include the following listed in Table I-1:

Table I-1
Identified Nearest Noise-Sensitive Land Uses

ID	Locations	Land Use
S1	Quality Inn 1375 E University Drive	Hotel
S2	Gateway Apartments 1655 E. University Dr.	Multifamily residential
S3	Dorsey Place Condominiums 1275 E University Dr.	Multifamily residential
S4	Northwest corner of vacant lot that adjoins the Tempe/APS Joint Fire Training Center to the west	Anticipated multi-family residential

Determination of Existing Sound Levels

The existing outdoor sound environment in the vicinity of the Project and the identified noise-sensitive receiver locations listed in Table I-1 can be characterized as having acoustical contribution from a variety of sources, of which nearby roadway traffic and existing Power Plant operations were generally observed to be dominant. To help assess the contribution of each of these dominant sound sources, and as detailed in the following paragraphs, road traffic noise was estimated with an industry-accepted methodology and plant operation noise was measured at various locations within the Ocotillo Site.

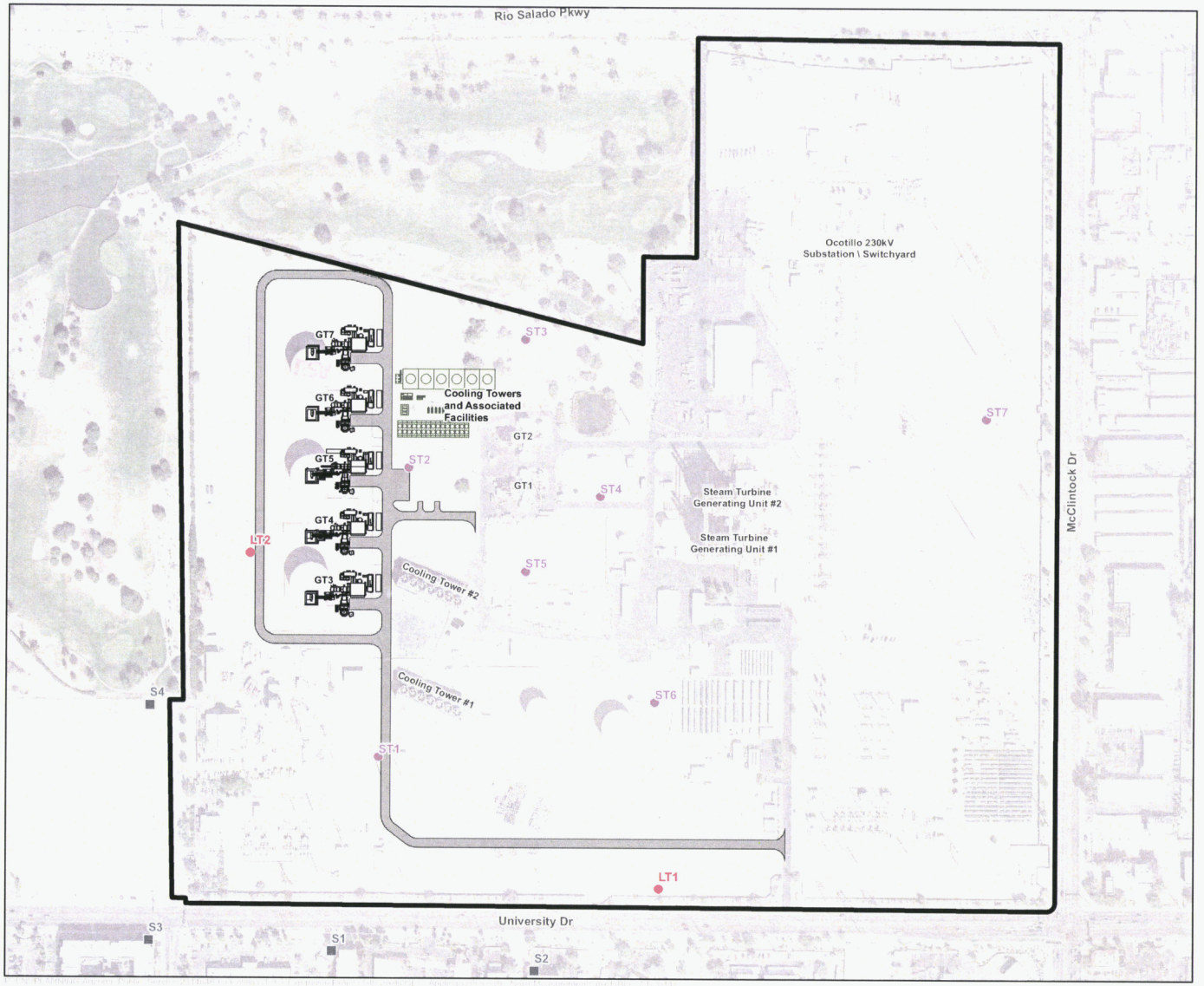


Figure I-2

Baseline Ambient Sound Level Measurement

Ocotillo Modernization Project

Legend

- Existing Ocotillo Power Plant
- Nearest Noise Sensitive (S) Receiver
- Short-Term (ST) Baseline Sound Level Measurement Location
- Long-Term (LT) Baseline Sound Level Measurement Location

Proposed Site Layout

- Proposed GT
- Cooling Towers and Associated Facilities
- Internal Access Road

GT = Gas Turbine Generator

S1 Quality Inn
S2 Gateway
S3 Dorsey Place Condos
S4 NW Corner of E. University Ave and S. Dorsey Lane

Source:
Noise Measurement Locations: URS 2013
Project Features: APS 2013 - 2014
Base Map: ADOT 2014
Imagery: FCDMC 2012

N

0 150 300
Feet
1:3,800

aps

Ambient Noise Estimates

Using 2012 roadway traffic volume data and parameters available from the Arizona Department of Transportation (ADOT) for the segment of East University Avenue between McClintock Drive and approximately 500 feet west of South Dorsey Lane, existing outdoor ambient sound was estimated for the four noise-sensitive receiver locations identified in Table I-1 with the Federal Highway Administration (FHWA) Traffic Noise Model (TNM, version 2.5). Results of these TNM predictions appear in Table I-2, and are based on the following model input parameters:

- Annual Average Daily Traffic (AADT) = 27,360 vehicles (14,798 eastbound, 12,562 westbound);
- Posted speed limit = 40 miles per hour (mph);
- Vehicle split = 94.3% automobiles, 3.5% medium trucks, 2.2% heavy trucks;
- K Factor = 10% (i.e., ten percent [10%] of AADT is considered a "peak hour" of traffic volume, as opposed to straight averaging of AADT over 24 hours).

Table I-2
Predicted Roadway Traffic Noise from E. University Avenue

Figure I-2 Location ID	Predicted dBA with K Factor (10% of AADT)	Predicted dBA with AADT/24 (average hourly)
S1	73.2	69.4
S2	71.8	68.1
S3	75.8	72.0
S4	60.4	56.6
LT1	66.7	62.9

The predicted traffic noise levels at S1, S2 and S3 are expected to be similar, given their similar perpendicular distances to East University Avenue. As S4 is farther away, the predicted traffic noise level is unsurprisingly much less than that of the other three positions. If these estimates shown in Table I-2 are accurate, measured ambient sound at these positions would be expected to be somewhat higher (depending primarily on distance) due to the added contribution of plant operations noise and indistinct background sound.

Ambient Noise Measurements

A series of SPL measurements was conducted from August 14 to August 16, 2013, at locations well within the Ocotillo Site and along the property line to quantify the existing ambient outdoor noise environment, with particular emphasis on assessing acoustical contribution from existing typical Power Plant operations. Shown in Figure I-2, seven (7) "short-term" (ST) measurement positions were located near facility operating systems, while two (2) "long-term" (LT) monitors were located along the southern and western boundaries of the Ocotillo Site.

The ST positions were selected for the purpose of measuring noise from the Power Plant systems where acoustical contribution from other sound sources would unlikely have significant or even measurable contribution. Hence, ST positions were within a few hundred feet of plant systems of interest, such as the pair of existing steam turbines, the GT pair, and the two (2) existing cooling towers. The selected distances tend to reflect, to the extent practical, guidance appearing in the American National Standards Institute (ANSI) B133.8 standard, which implies that sound measurement positions should be in the

acoustic far-field of system noise emission (i.e., where geometric divergence reliably exhibits 6 dB attenuation of sound pressure per doubling of distance).

The LT positions were located within the Ocotillo Site boundary but in the general path of sound emission from major Power Plant systems to some of the nearest noise-sensitive receiver locations. At these locations, which are more distant from Power Plant systems than the ST measurement positions, acoustical contribution from plant sound sources would be less while sound from non-Project sources (e.g., nearby roadway traffic noise) would exhibit more significance—or dominate the local sound environment.

The results of the LT and ST measurements are summarized in Table I-3. While the ST measurements were originally intended to last only through the duration of a set of APS-controlled operation scenarios, field conditions and instrument power source longevity provided an opportunity for all nine (9) SPL monitors to measure through the nighttime of August 15 and continue into the following morning of August 16.

SPL measurements were conducted using ANSI Type 1 or 2 Integrating Sound Level Meters (SLM) manufactured by Larson Davis. The Model 820, 720 and 712 SLMs had microphones fitted with factory-supplied windscreens to help reduce undue wind-induced noise (WIN) during SPL measurement and thus lessen the corresponding risk to obtaining usable measurement data. Instrument calibration, which has been factory-checked annually per industry guidelines, was field-checked before and after each measurement period with a Larson Davis CAL150B acoustic calibrator. SPL measurements were conducted, to the extent practical, in accordance with applicable portions of International Standardization Organization (ISO) standard 1996-2.

An additional ANSI Type 1 SLM (Larson Davis Model 824), with real-time one-third octave band analysis functionality, was also used to perform concurrent SPL measurements at multiple ST monitoring locations during the portions of the measurement survey occurring daytime hours on August 15 and the morning of August 16. Measurement data collected at one-third octave band center frequency ("OBCF") resolution would be used to help determine predictive noise model parameters associated with the existing steam and GT units.

Weather conditions during the survey period were seasonally hot with generally clear skies and no observed precipitation. Using a Speedtech SM-28 handheld anemometer, measured air temperature varied from 82 degrees Fahrenheit (°F) at 6:14 a.m. on August 15 to 111°F at 2:15 p.m. later the same day, with relative humidity ranging from 40-50% in the morning to 25-30% in the early afternoon. Observed wind speeds were moderate, ranging from 3 to 6 miles per hour, and largely coming from the southeast direction.

Table I-3
Sound Pressure Level (SPL) Measurement Summary (dBA)

Monitoring Position	Start Date (mm/dd/yy) and Time (hh/mm)	End Date (mm/dd/yy) and Time (hh/mm)	L_{dn} [1]	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
LT1	8/14/13 (11:05)	8/16/13 (10:20)	71	68 [2]	91	53	68	63	55
LT2	8/14/13 (10:40)	8/16/13 (10:10)	65	63 [3]	93	48	67	57	50
ST1	8/15/13 (06:17)	8/16/13 (10:18)	74	68 [4]	81	66	71	68	66
ST2	8/15/13 (06:08)	8/16/13 (10:00)	69	69 [5]	85	60	76	64	61
ST3	8/15/13 (06:25)	8/16/13 (10:08)	67	67	83	52	73	61	53
ST4	8/15/13 (06:03)	8/16/13 (10:04)	74	73	85	58	78	69	58
ST5	8/15/13 (06:07)	8/16/13 (10:35)	73	74	91	62	78	67	63
ST6	8/15/13 (06:11)	8/16/13 (10:31)	72	73	89	52	74	64	54
ST7	8/15/13 (06:20)	8/16/13 (09:50)	75	68	83	53	74	60	54

[1] Day-night level (L_{dn}) is calculated from hourly Leq, over the duration from 8/15/13 07:00 through 8/16/13 07:00.
[2] Leq is over the duration from 8/14/13 11:05 and 8/16/13 08:00.
[3] Leq is over the duration from 8/14/13 10:40 and 8/16/13 07:50.
[4] Leq is over the duration from 8/15/13 07:00 and 8/16/13 07:45.
[5] Leq is over the duration from 8/15/13 06:08 and 8/16/13 07:26.

Please refer to Attachment I-1 for photographs of the measurement locations, and Figure I-2 for a map of their positions superimposed upon an aerial view of the Ocotillo Site and its immediate geographic surroundings. Attachment I-2 displays plots of measured L_{eq} over time for each of the nine (9) SPL monitoring locations listed in Table I-3. Prominence-producing events or activities, such as steam and GT operating status, may appear as annotations on these plots. The following are brief descriptions of each monitoring location and key findings or observations with respect to acoustical contribution from Project and non-Project sources.

LT1 – The SLM microphone was affixed to the lower structure of a transmission tower near the southern Ocotillo Site property wall. The height of the microphone, shown in Photographs 1 and 2, was chosen so as to measure sound emission from the Power Plant sources that might have unblocked line-of-sight (LOS) with second-story residential dwelling units on the southern side of East University Avenue, such as noise-sensitive receiver position S2 from Table I-1. At this height, the microphone was expected to have more direct exposure (i.e., less noise reduction from the property line barrier wall) to roadway traffic noise from East University Avenue. Over the two-day monitoring period, Figure 8 (Attachment I-2) shows that daytime L_{eq} ranged from 63 to 65 dBA, while nighttime L_{eq} dipped to approximately 57-58 dBA. The daytime L_{eq} range appears to be fairly consistent with the non-K-factor "average" hourly dBA predicted East University Avenue traffic noise shown in Table I-2 for location LT1.

LT2 – The SLM microphone was affixed to the chain-link fence along the western boundary of the Ocotillo Site that abuts the paved (and empty) parking area of the Tempe/APS Joint Fire Training Center. While located west of the existing large storage tanks, the microphone position had direct LOS with the steam units and GT units. Over the two-day monitoring period, Figure 9 (Attachment I-2) shows that daytime L_{eq} generally ranged between 55 dBA and 65 dBA, while nighttime L_{eq} dipped to approximately 50 dBA. The low end of this daytime L_{eq} range appears to agree with the non-K-factor "average" hourly dBA predicted East University Avenue traffic noise shown in Table I-2 for receiver S4.

ST1 – This location was chosen to measure existing cooling tower noise, where the southern cooling tower structure obscures visibility (and hence, direct sound emission paths) of the existing GT units and the steam turbines. The relative "flatness" of the L_{eq} plot shown in Figure 1 (Attachment I-2) appears to confirm that the cooling tower systems are indeed operating through the night, particularly during early morning hours when road traffic noise would—based on reduction in traffic volumes—be significantly diminished as an acoustic contributor to the measured ambient SPL.

ST2, ST3, ST4 – These monitoring locations were selected for the purpose of measuring noise emission near the pair of existing GTs, and thus reduce the relative contribution of other sound sources to the measured ambient SPL, but reasonably distant enough from specific GT components so that it could be said the measurements were performed in the acoustic "far field" (i.e., where the aggregate sound from GT operating system components might be considered to propagate predictably via geometric divergence and relatively free from localized mode shapes or constructive/destructive interference).

ST5 – Similar to ST2, ST3, and ST4, this SPL monitoring position is near the existing GTs and is also in proximity to the western side of the pair of steam units.

ST6 – This SPL measurement position is near the southern large storage tank and approximately half the distance of LT1 to the steam units.

ST7 – This SPL measurement position is located to the east of the steam units and west of South McClintock Drive. Near a locked fenced gate in an opening of the property line wall, this position was expected to receive more exposure from road traffic noise. But being on the eastern side of the steam units, this position receives less exposure to noise from the existing GT units.

Common to all nine (9) SPL monitoring positions, measured daytime noise sources included both near and distant roadway traffic, Power Plant operating systems, and commercial (as well as some apparent military) aircraft overflights. Nighttime noise sources, while not directly observed during noise investigations, are assumed to similarly include near and distant roadway traffic, Power Plant operating systems, and (at most) a few hours of commercial aircraft overflights. Even when steam and GT units are not active, the plant cooling tower systems continue to operate (for water recirculation) and produce noise.

Topographical Conditions

The geography of the Ocotillo Site is relatively flat, with a few earthen berms or embankments situated around storage tanks on the site. Beyond the Ocotillo Site boundary, the surrounding community can also be characterized as generally flat on which can be found commercial development to the east, a municipal training facility to the southwest, a golf course to the north and northwest, and residential or mixed-use development to the south.

NOISE IMPACTS FROM PROPOSED PROJECT

Noise will be produced at the proposed Project site during construction and operation of the Project. Potential noise impacts from both activities will be assessed in this section. Federal, state, and local requirements and guidance that apply to the Project are summarized in the following paragraphs.

Applicable Laws, Regulations, Ordinances, or Standards

Federal

There are no federal laws, regulations, ordinances, or standards that directly affect this Project with respect to noise. However, there are guidelines at the federal level that direct the consideration of a broad range of noise issues. For instance, United States Environmental Protection Agency ("EPA") has not promulgated standards or regulations for environmental noise generated by power plants; however, EPA has published a guideline that specifically addresses issues of community noise (EPA Levels Document, Report No. 556/9-74-004). This guideline, commonly referred to as the "levels document," contains goals for noise levels affecting residential land use of L_{dn} <55 dBA for exterior levels and L_{dn} <45 dBA for interior levels. The Department of Housing and Urban Development ("HUD") Noise Guidebook Chapter 2 Section 51.101(a)(8) also recommends that exterior areas of frequent human use follow the EPA guideline of 55 L_{dn}. However, the same Section 51.101(a)(8) indicates that a noise level of up to 65 dBA L_{dn} could be considered acceptable.

Federal Highway Administration ("FHWA") guidance concurs with this apparent 10 to 20 dBA exterior-to-interior noise level difference by describing the following building noise reduction factors (for all building types) as follows: window open, 10 dBA; ordinary sash (closed), 20 dBA.

Occupational exposure to noise is regulated by Title 29, CFR, Part 1910.95 occupational noise exposure. Protection against the effects of noise exposure shall be provided when the sound levels exceed an average of 90 dBA for an 8-hour period. When employees are subjected to sound exceeding this limit, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within 90 dBA, personal protective equipment shall be provided and used to reduce sound levels within the limits. The employer shall administer a continuing, effective hearing conservation program whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 dBA (measured via slow response) or, equivalently, a dose of fifty percent (50%). For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with CFR 1910.95 Appendix A (noise exposure computation) without regard to any attenuation provided by the use of personal protective equipment.

State

The Arizona Corporation Commission ("ACC") will review noise impacts per its rules. As stated in the Arizona Corporation Commission Rules of Practice and Procedure R14-3-219:

> "*Describe the anticipated noise emission levels and any interference with communication signals which will emanate from the proposed facilities.*"

Local

The Project and environs are within the City of Tempe, Arizona, which has noise ordinance language in its code but provides specific exemption per Section 20-4.(9) with regard to power generation facilities as follows:

"Power plant equipment during normal operation provided that no plant equipment may cause the noise level measured inside any sleeping or living room inside any residential dwelling unit to exceed forty-five (45) dB(A) between the hours of 10:00 p.m. and 7:00 a.m., nor fifty-five (55) dB(A) between the hours of 7:00 a.m. and 10:00 p.m."

With respect to construction noise, Section 20-8 of the Tempe Code describes allowable activity periods and setback distances that are summarized as follows:

- From April 15 to October 15 inclusive, concrete may be poured, and concrete mixing trucks may be idled, each day between the hours of 5:00 a.m. and 7:00 p.m. or at such other times pursuant to written authorization. From October 16 to April 14 inclusive, concrete may be poured, and concrete mixing trucks may be idled, each day between the hours of 6:00 a.m. to 7:00 p.m. or at such times pursuant to written authorization.
- Construction and repair work in commercial and industrial zones not within five hundred (500) feet of a residential zone shall not begin prior to 5:00 a.m. and must stop by 7:00 p.m. or it may be conducted at such other times pursuant to written authorization.
- Weekends and holidays excluded. Notwithstanding the foregoing, construction or repair work shall not begin prior to 7:00 a.m. and must stop by 7:00 p.m. and concrete pouring should not begin prior to 6:00 a.m. and must stop by 7:00 p.m. on any Saturday, Sunday or holiday, unless such other times are allowed by written authorization.
- Construction and repair work may be conducted at different times and at higher noise levels than otherwise permitted herein if written authorization is obtained beforehand from the city manager or his authorized representative. In granting such authorization, the city manager or his authorized representative shall consider if construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population levels or different neighboring activities; if obstruction and interference with traffic, particularly on streets of major importance, would be less objectionable at night than during the daytime; if the kind of work to be performed emits noises at such a low level as to not cause significant disturbance in the vicinity of the work site; if the neighborhood of the proposed work site is primarily residential in character wherein sleep could be disturbed; if great economic hardship would occur if the work was spread over a longer time; if the work will abate or prevent hazard to life or property; if the proposed early morning or night work is in the general public interest, and he shall prescribe such conditions, working times, types of construction equipment to be used and permissible noise emissions as he deems to be required in the public interest. No written authorization shall be required to perform emergency work as defined in § 20-2.

Outside of these allowable time periods, or if without prior written permission, the noise level created by construction activity may not exceed the applicable community noise standard by five (5) dBA at either the nearest property line or the affected area of the property. Section 20-6 details these community noise standards as follows:

- Residential (10:00 p.m. – 7:00 a.m.) 45 dBA; (7:00 a.m. – 10:00 p.m.) 55 dBA;
- Commercial (10:00 p.m. – 7:00 a.m.) 55 dBA; (7:00 a.m. – 10:00 p.m.) 65 dBA;
- Industrial (10:00 p.m. – 7:00 a.m.) 60 dBA; (7:00 a.m. – 10:00 p.m.) 70 dBA;
- If the measurement location is on a boundary between two (2) zoning districts, the lower noise standard shall apply.

- If ambient noise in a residentially-zoned location is measured to be 40 dBA or less between the hours of 10:00 p.m. and 7:00 a.m., then this ambient noise level will be community noise standard.
- If ambient noise level in any zoning district is measured and found at any time to be in excess of the community noise standards, then the actual ambient noise level will be the community noise standard.

Compliance with Laws, Regulations, Ordinances, or Standards

Construction Noise

Without prior written permission from the City of Tempe, the applicable requirements suggest that a threshold of 60 dBA L_{eq} (over a 15-minute duration) would apply during the daytime at the property line of a potentially affected noise-sensitive receiver.

Operations Noise

For future Project operation scenarios the following two criteria have been assumed as suggested noise impact indicators as follows:

- For spring, fall, and winter months when nearby residents may have windows and/or doors open and merely screened to allow natural ventilation and cooling, a level of 55 dBA L_{eq} during the nighttime immediately outside a bedroom or other occupied living space would be the expected threshold. This 10 dBA difference from the local interior noise limit with respect to power plant operations (i.e., 45 dBA at night) is consistent with the aforementioned FHWA expectation of 10 dBA of exterior-to-interior noise reduction for an occupied dwelling with open windows. Similarly, the noise criterion immediately outside a bedroom or occupied living space during daytime hours would be 65 dBA.
- For summer months when windows and doors would normally be expected to be closed (for purposes of effectively and efficiently running evaporative or refrigerant-based air-conditioning systems), and thus allow at least 20 dBA of net noise reduction (assuming modern construction techniques), the nighttime threshold immediately outside a bedroom or other occupied living space would be 65 dBA. During the day, this limit would 75 dBA.

For purposes of conservative noise impact analysis with respect to anticipated Project operation, the lowest of these suggested external noise thresholds, 55 dBA L_{eq} (over a 15-minute duration), will be utilized. However, the reader should recall the following:

- From the preceding section on existing ambient noise, roadway traffic noise alone is estimated to be several dBA over this threshold for three of the four identified nearest noise-sensitive receivers. Hence, measurement of Project operation noise compliance in an interior dwelling space under such conditions could be very difficult to discern, as ambient sound containing road traffic noise would likely mask Project noise to some degree.
- The 10 dBA exterior-to-interior noise reduction factor may be conservative. For example, guidance from the World Health Organization ("WHO") states that a 15 dBA reduction may be assumed between an interior bedroom noise level and the outdoor noise level immediately outside.

- Noise-sensitive receiver S4 is currently not noise-sensitive, as there is no residential sleeping or living room there at the time of this writing. Thus, S4 would only be considered a noise-sensitive receiver if and when future construction would create such an inhabited dwelling on this currently vacant lot.

Project Noise Prediction

Construction Noise

Information from the available Project description indicates the anticipated Project construction schedule would take place over a period of approximately 26 months. During construction activities, a varying number of construction equipment and personnel will be in the area, resulting in varying levels of construction noise. A roster of expected construction equipment and corresponding monthly activity schedule was reviewed and appears summarized in Table I-3, showing estimated reference sound levels. Conventional construction activities at the Ocotillo Site would result in a short-term, temporary increase in the ambient noise level resulting from the operation of construction equipment and vehicles. The increase in noise level would be primarily experienced close to the noise source. The magnitude of the noise effects would depend on the type of construction activity, noise level generated by construction equipment, duration of the construction phase(s), and the distance between the noise source and receiver.

Potential noise impacts associated with the Project construction activities were assessed with spreadsheet-based noise calculations. User inputs include (1) distances between the modeled acoustic "centers" and the receivers, (2) quantities of equipment or events over a specific time period (e.g., equipment utilization per month), and (3) usage factor that is represented by a percentage to describe the average aggregate time in a typical work day that a piece of equipment is energized (i.e., engine running). As the exact location of mobile and stationary construction equipment is not yet known, the acoustic center-point (from which the aggregate of all noise-producing construction activities emits) is considered to be at the geographical center of each new LMS100 installation location, where, on average, most of the construction activity would likely be located when each of the five new GTs are installed. This is considered a reasonable approximation when one notes that the largest dimension of this construction zone (i.e., the footprint of a proposed LMS100 GT location) is generally small compared to the distances between it and the closest receivers.

Parameters specific to expected construction activities were input in the model to predict individual sound level contributions with the following terms and equation:

$$L_{eq} = \text{Source SPL} + 10 * \log_{10}(\text{Usage Factor}) + 10 * \log_{10}(\text{Quantity}) - 20 * \log_{10}(\text{Distance from Source / Reference Distance}) - A_{air} - A_{ground}$$

where A_{air} and A_{ground} are attenuation quantities based on calculation of air and ground absorption effects, respectively, per ISO 9613-2. The calculation then logarithmically sums these individual sound levels (equipment-related sources, as suggested in Table I-4) to arrive at aggregate L_{eq} values for a construction activity category with respect to a specific receiver point. The results of the aggregate calculations for each sensitive receiver (assuming the noise emanates from the southern-most new GT installation) are summarized in Table I-5.

Table I-4
Summarized Estimated Construction Equipment Roster and Reference Sound Pressure Levels

Construction Equipment Type	Vehicle or Equipment Engine Power (HP)	Individual Equipment SPL at 50' ($dBA_{,max}$)	Equipment Quantity Range per Month	Acoustical Usage Factor (%)	RCNM User's Guide Table 1 Reference[1]
Air Compressor, 300-400 CFM, electric	100	78	0-2	40	Air compressor
Concrete Saw, 5-7" wet cut	50	90	0-1	20	Concrete saw
Grout Pump, 4-5 cubic yard (CY), pneumatic	n/a	81	0-1	50	Pumps
Boring System, pilot tube, auger, hydraulic	n/a	84	n/a	20	Auger drill rig
Boring System, 30-36", auger, diesel	n/a	83	n/a	50	Boring jack power unit
Skidsteer, 36-45 HP	45	68	0-2	50	"Bobcat" [2]
Wheel loader, 2.5-3.0 CY	130	79	0-2	40	Front loader
Excavator, 50-60K#	250	81	0-1	40	Excavator
Generator, 5-7KW, gasoline	20	73	2-10	50	Generator
Manlift, 60' RT, gasoline or diesel	85	75	0-3	20	Manlift
Manlift, 120' RT, gasoline or diesel	85	75	0-3	20	Manlift
Crane, 70-79 ton, hydraulic, RT	250	81	0-2	16	Crane
Crane, 225-250 ton, lat-boom, mech, crawler	420	81	0-2	16	Crane
Forklift, 6K# RT, tele-boom	100	81	0-4	16	Crane
Welder, 250-300 A, diesel	22	74	0-10	40	Welder/torch
Flatbed,1-ton, 4X4	n/a	74	0-1	40	Flatbed truck
Flatbed,1-ton, 4X4, liftgate	n/a	74	0-2	40	Flatbed truck
Pickup, ¾-ton, 2X4	n/a	75	0-7	40	Pickup truck
Pickup, ¾-ton, 2X4, crewcab	n/a	75	0-1	40	Pickup truck
Pickup,1-ton, 4X4	n/a	75	0-1	40	Pickup truck
Automobile	n/a	75	0-1	40	Pickup truck
Polypipe fusion machine, 1-4"	22	85	0-1	50	All other equipment > 5HP
Polypipe fusion machine, 2-8"	22	85	0-1	50	All other equipment > 5HP

[1] Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (2006).
[2] "Grange Resources" Vipac report (2006).

Table I-5
Predicted Construction Noise Levels (average hourly L_{eq}) at Nearest Noise-Sensitive Receivers

Sensitive Receiver Identification (see Figure I-2)	Direction from Center of Proposed GT3 (southern-most new GT)	Distance from Center of Power Block (ft)	Predicted Range of Average Hourly SPL (dBA L_{eq})
S1	South	900	47-60
S2	Southeast	1,200	45-58
S3	South-Southeast	1,200	45-58
S4	Southwest	600	51-64

While these predicted construction noise levels may temporarily exceed the 60 dBA daytime threshold for some months of the Project construction schedule and its anticipated activity intensity, they would be permitted given prior written approval and/or during allowable construction process hours as described in the earlier section of this Exhibit.

Occupational Noise

Compliance with the Occupational Safety and Health Administration ("OSHA") regulations will help ensure that construction personnel are adequately protected from potential noise hazards. The noise exposure level to protect hearing of workers is regulated at a time-weighted average of 90 dBA over an 8-hour work shift. The Project's contractors are required to comply with all OSHA regulations. Therefore, occupational noise would not result in significant impacts.

Construction Traffic

The construction traffic would consist of workers' transportation vehicles, delivery trucks, and heavy trucks. The specific information regarding construction traffic for the project is as yet undetermined; however, assuming such temporary increases in traffic volume would result in proportions of passenger cars and trucks that are similar to pre-Project ratios, the increase in traffic flows on E. University Avenue and connected roadways would likely result in a minor increase in traffic noise. To help put it in perspective, each *doubling* of traffic volume (composed of the same mix of vehicle types and speeds) would be expected to cause an increase in traffic-generated noise level of only 3 dBA.

Operational Noise

Prediction Methods

The Cadna/A® Noise Prediction Model (Version 4.4.145) was used to estimate sound levels at noise-sensitive receivers due to Project operation scenarios. Cadna/A® is a Windows® based software program that predicts and assesses noise levels near industrial noise sources based on ISO 9613-2 standard for noise propagation calculations. The model uses industry-accepted propagation algorithms and accepts PWL (in dB re: 1 pico Watt) provided by equipment manufacturers and other sources. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. Given the Ocotillo Site and surrounding areas being generally flat, no intervening natural topographical barrier effects were considered; however, the following buildings and structures have been included in the prediction model (depending on studied scenario):

- Proposed control, warehouse and water treatment buildings;
- Proposed new cooling tower and air-cooled heat exchanger;
- Existing cooling towers;
- Existing steam and GT units;
- Proposed tanks adjacent to the proposed water treatment building;
- Gas compression enclosures; and
- Enclosures/casings/stacks associated with the proposed new LMS100 GT units.

Calculations were performed using un-weighted octave band sound power levels as inputs from each pre-defined noise source, as summarized in Table I-6. For noise sources lacking client-supplied sound data, sound levels were based on noted references and/or appropriate calculation methods and assumptions based on available Project description information at the time this Exhibit was prepared. For example, the PWL (at OBCF resolution) for some of the equipment categories in Table I-6 are based on sound levels of similar equipment presented in the predictive operation noise analysis for the proposed Pio Pico Energy Center project in southern California, which intends to utilize three LMS100 units and associated ancillary systems for power generation.

The PWL for the last five items in Table I-6, representing existing facility systems, are calculated from SPL measurement data collected during the August 15-16 field survey. The Cadna/A program can accept such SPL (along with the distance between the measurement location and the source of noise emission) and perform this conversion to PWL automatically.

Given the faster start-up times and newer technology associated with the proposed GE LMS100 GT units, as compared to the existing GT units, this analysis assumes the start-up noise of a new GT is quieter than the start-up noise of an existing GT and would be shorter in duration; hence, only existing GT start-up noise has been considered in this analysis.

For purposes of this analysis, "steady-state" assumes full-load operation of an identified power plant system or component.

Aside from the PWL of individual equipment as shown in Table I-6, additional model parameters to help determine the influence of air and ground absorption effects were input as follows:

- Air temperature = 10° C
- Relative humidity = 70%
- Windspeed = 0 mph
- Project site and vicinity ground absorption coefficient = 0.5

While temperature and relative humidity in the Project vicinity can range between different daily and seasonal extremes, the values shown above are conservative with respect to sound attenuation from air absorption. Audible sound, particularly of higher frequencies, travels farther when there is more moisture in the air. Hence, air absorption is relatively poor in a moist climate with high humidity but better in a dryer climate.

With respect to ground absorption, the coefficient values can range from zero (0), representing a hard or otherwise acoustically reflective surface such as smooth concrete or a body of water, to unity (1) which would represent a porous surface such as loose, tilled soils and vegetative ground cover. Due to the Ocotillo Site having a mixture of large expanses of loose gravel (high acoustical absorption), packed dirt and paved areas, an average coefficient value of 0.5 seems appropriate.

Table I-6
Predictive Operational Noise Model Source Parameters

Proposed Project Component (per unit, unless otherwise noted)	Sound Power Level (PWL, dB) per Component at Octave Band Center Frequency (OBCF, Hz)									A-Weighted (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Air compressor skid	91	98	96	96	93	92	91	90	86	98
Ammonia system	95	106	100	100	97	96	95	94	90	102
Auxiliary transformer	80	86	88	83	83	77	72	67	60	83
Building roof-mounted ventilation fan	95	95	91	87	84	82	80	76	76	88
New combustion turbine generator (GT) turbine and generator enclosure	124	115	116	103	102	98	101	100	92	108
New GT J3 bearing vent fan	89	95	91	94	93	92	91	86	77	97
New GT air inlet filter face	119	115	112	103	93	82	71	57	59	99
New GT inlet filter face ventilation air	89	90	93	89	90	95	99	93	85	102
New GT inlet filter house and ducting	126	122	113	96	81	68	74	74	72	100
New GT step-up transformer	96	102	104	99	99	93	88	83	76	99
Demineralized water pump	86	93	91	91	88	87	86	85	81	93
Gas compressor aftercooler	110	110	109	106	101	99	93	87	81	104
Gas compressor enclosure	117	108	107	106	90	79	73	63	61	99
New GT intercooler system and variable bypass valve (VBV) silencer diffuser pipes	109	101	102	100	101	92	88	87	72	100
New GT Selective Catalytic Reduction (SCR) structure	118	105	101	102	98	89	82	76	62	98
New GT SCR stack shell	126	113	109	110	106	94	90	83	66	106
New GT SCR Stack Exhaust exit with silencer	123	114	115	109	114	107	102	97	85	113
New GT auxiliary skid	102	104	107	87	101	94	95	84	78	102
New GT intercooler cooling system	97	105	107	106	105	104	99	90	62	107
New GT SCR system fans	n/a	102	102	98	95	94	86	82	82	98
Service water pump	86	93	91	91	88	87	86	85	81	93
Waste water pump	86	93	91	91	88	87	86	85	81	93
Water treatment building	100	103	97	91	77	68	61	55	54	85
New cooling tower (CLGTWR) structure	108	111	102	103	98	99	93	92	92	103
New CLGTWR fan	n/a	109	109	108	106	109	109	110	113	117
CLGTWR water pump	86	93	91	91	88	87	86	85	81	93
New Air-cooled Heat Exchanger (ACHE) (includes all 30 fans)	n/a	121	120	117	112	110	104	98	92	115
Existing steam unit (calculated from SPL measurement), "steady-state"	129	131	128	121	118	116	114	110	103	122
Existing steam unit (calculated from SPL measurement), "ramp-up"	132	133	130	125	126	128	131	126	111	135
Existing GT unit (calculated from SPL measurement), "steady-state"	126	127	121	111	104	101	103	99	92	111
Existing GT unit (calculated from SPL measurement), "ramp-up"	128	131	128	119	114	120	118	115	107	124
Existing cooling tower unit (calculated from SPL measurement), "steady-state"	121	121	117	112	111	110	107	105	103	115

Sources: California Energy Commission (2012); URS (2013); APS (2014); Kiewit (2013).

Modeled Scenarios

Table I-7 shows a set of scenarios representing different Project operating conditions as follows:

1. Current operations (Scenarios A, B) – the first scenario (A) assumes only both existing GT units are operating at "steady-state" and reliably delivering power at or near full capacity—the steam units are off-line. Conversely, Scenario B considers operation of just the steam pair, while the GT units remain inactive.

2. Current operations (Scenarios C, D, E, F, G) – the first of this scenario set (C) assumes both steam units and both GT units are operating at "steady-state" and reliably delivering power at or near full capacity. The next four look at individual cases where one of these four (4) existing power units may be in a "ramp-up" process and thus—as measured during the baseline SPL survey—create significantly more noise.
3. Expected 2018 operations (Scenarios H, I, J) – these scenarios involve all five (5) new LMS100 GT units added to operation of the existing pair of GT units. Both the new cooling tower and air-cooled heat exchanger are used as the cooling technology for the new GT units.
4. Expected 2018 operations (Scenario K) – this scenario assumes only the five (5) new GT units are operating (i.e., the existing GT units are off-line).

As indicated in Table I-7, scenarios A through G commonly (and conservatively) assume that both existing cooling towers are operating. For scenarios H through K on Table I-7, it is assumed the existing cooling towers and steam turbines have been decommissioned and dismantled (i.e., they are no longer sources, and their structures have also been removed as potential sound barriers in the model).

RESULTS

Predicted Project Operation Noise

The summarized results of preliminary predictive calculations for anticipated Project operation noise, using the listed noise-emitting sources shown in Table I-6, are presented by scenario in Table I-7.

Table I-7
Preliminary Predicted Project Operation Noise per Scenario at Nearest Noise-sensitive Receivers

Scenario ID	Equipment Operating Status per Scenario ("Y" = yes, "n/a" = not applicable, "stdy" = "steady-state", "ramp" = "ramp-up")												Predicted L_{eq} (dBA) at Noise-sensitive Receivers			
	Steam-south	Steam-north	GT1 (south)	GT2 (north)	GT3	GT4	GT5	GT6	GT7	ACHE	CLGTWR	Existing cooling towers	S1	S2	S3	S4
A	n/a	n/a	stdy	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	56.7	57.0	55.1	57.5
B	stdy	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	60.3	61.2	57.9	60.0
C	stdy	stdy	stdy	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	60.4	61.4	58.0	60.0
D	ramp	stdy	stdy	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	68.3	70.4	65.7	67.7
E	stdy	ramp	stdy	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	66.8	67.4	61.7	63.4
F	stdy	stdy	ramp	stdy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	60.7	63.4	58.4	60.5
G	stdy	stdy	stdy	ramp	n/a	n/a	n/a	n/a	n/a	n/a	n/a	yes	60.6	61.7	58.3	60.2
H	n/a	n/a	stdy	stdy	stdy	stdy	stdy	stdy	stdy	yes	yes	no	58.4	58.2	57.0	61.8
I	n/a	n/a	ramp	stdy	stdy	stdy	stdy	stdy	stdy	yes	yes	no	61.0	61.7	59.3	62.1
J	n/a	n/a	stdy	ramp	stdy	stdy	stdy	stdy	stdy	yes	yes	no	60.1	59.0	57.5	61.9
K	n/a	n/a	n/a	n/a	stdy	stdy	stdy	stdy	stdy	yes	yes	no	58.0	57.8	56.7	61.8

In summary, the predictive analysis results from Table I-7 illustrate that the proposed "steady-state" operation Scenarios (A, B, H, K) are not expected to comply with the suggested 55 dBA L_{eq} exterior nighttime noise impact criterion without some form of noise control or sound abatement. Recall that this

55 dBA L_{eq} criterion is based on the assumption of open residential receiver windows and doors, and is subject to the influence of seasonal environmental conditions and, ultimately, dwelling occupant choice.

During the daytime (7:00 a.m. to 10:00 p.m.), however, and at night when residential receiver windows and doors are closed, the prediction model expects all four of these "steady-state" scenarios to comply with the suggested exterior 65 dBA limit.

Occupational Noise

Based upon the predicted noise level data, the noise levels very near major noise-producing Power Plant operating systems would be similar in magnitude to those already occurring onsite and for which APS already requires the use of hearing protection for worker noise exposure. Continued usage of such hearing protection as part of the existing APS hearing protection program for its workers (and requirement for contractors working on site) is therefore expected and encouraged.

Power Transmission

Noise sources associated with power transmission include occasional breaker operation in the substation, corona noise, and very low magnetostriction hum from the conductors. Breaker noise is considered impulsive in nature, lasting a very short duration and may occur only a few times per year. Corona noise is characterized as having high frequency components, like a buzz, and low frequency tones that are best described as humming sounds. While corona noise usually worsens when the transmission line conductors are wet, such as during rainfall, these conditions often provide sources of their own that help mask the increase.

The Electric Power Research Institute ("EPRI") has conducted noise studies and has published reference material on transmission line noise. Consistent with industry-accepted acoustic textbooks' discussion of propagation of noise from a line source, EPRI states that noise produced by a conductor decreases at a rate of 3 dB per doubling of distance from the source. The EPRI Transmission Line Reference Book indicates that the audible noise from a typical 525-kilovolt ("kV") line with two conductors per phase would likely be less than 40 dBA at a distance of 40 feet from the outside conductor at ground level. If only one conductor per phase is used, the noise level will be less.

Although the newly installed five (5) GT units would require new onsite Generation Interconnections, the anticipated low magnitude of corona noise emission as discussed above is—when compared to existing measured sound levels in the vicinity as presented in Table I-3—either less than or not expected to create a significant increase in ambient noise.

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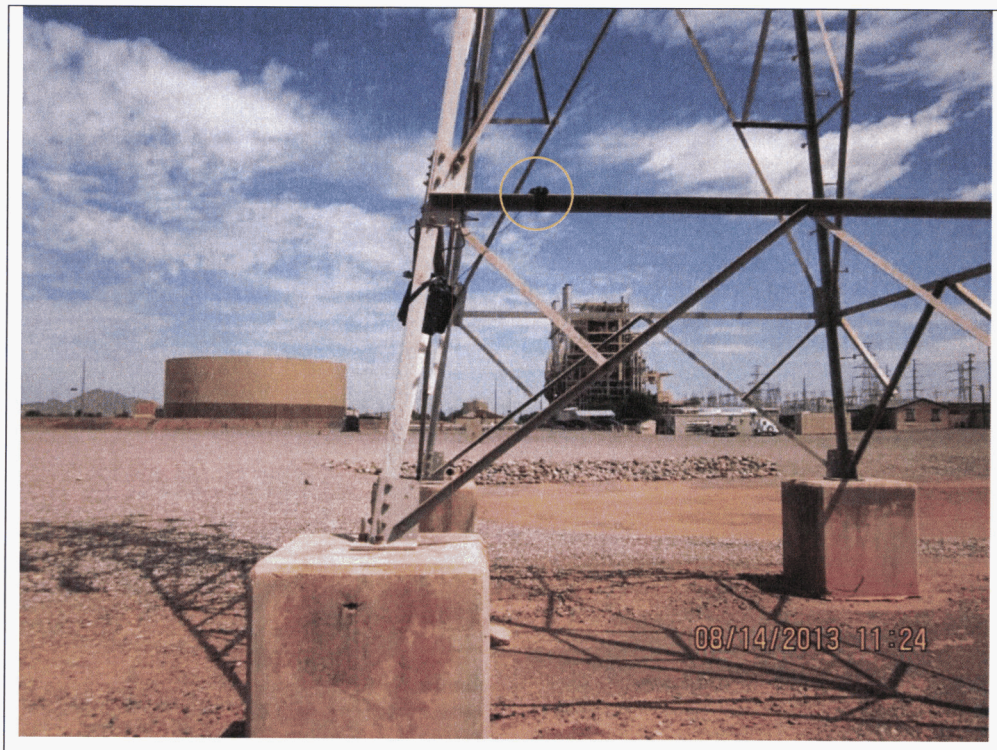
ATTACHMENT I-1 – PHOTOGRAPHS OF NOISE SURVEY POSITIONS

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS



Photograph 1

Date: 08/14/13
GPS: 0415120/ 3698470
View Direction: North

Comments:
SPL monitor location **LT1** near the southern Project property line that adjoins University Avenue.

(Windscreened SLM microphone encircled)

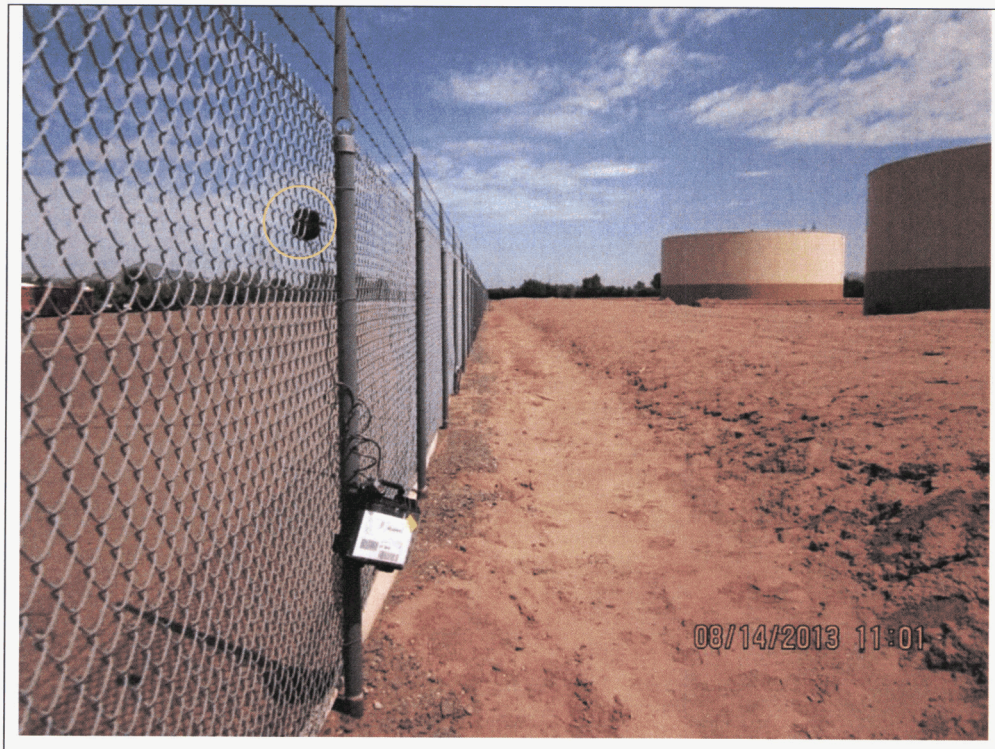
Photograph 2

Date: 08/14/13
GPS: 0415120/ 3698470
View Direction: South

Comments:
SPL monitor location **LT1** near the southern Project property line that adjoins University Avenue.

(Windscreened SLM microphone encircled)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS



Photograph 3

Date: 08/14/13
GPS: 0414749/ 3698765
View Direction: North

Comments:
SPL monitor location **LT2** near the western Project property line that adjoins the Tempe/APS Joint Fire Training Center.

(Windscreened SLM microphone encircled)

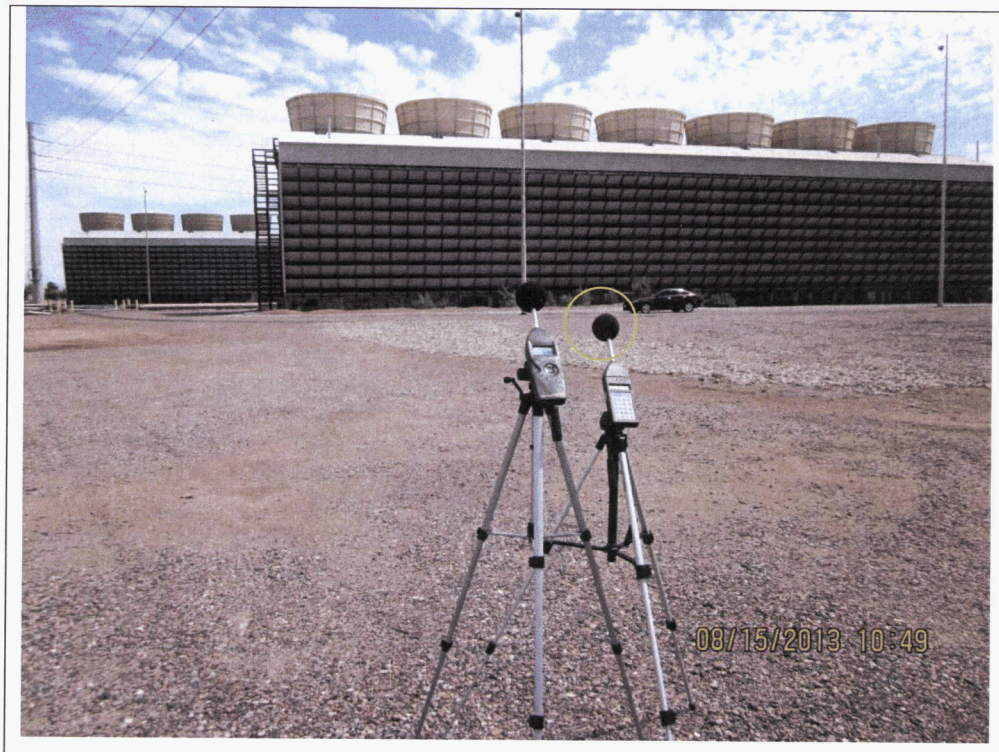
Photograph 4

Date: 08/14/13
GPS: 0414749/ 3698765
View Direction: West

Comments:
SPL monitor location **LT2** near the western Project property line that adjoins the Tempe/APS Joint Fire Training Center.

(Windscreened SLM microphone encircled)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS



Photograph 5

Date: 08/15/13
GPS: 0414862/ 3698589
View Direction: Northeast

Comments:
SPL monitor location **ST1**, south of the southern-most existing cooling tower.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

Photograph 6

Date: 08/15/13
GPS: 0414862/ 3698589
View Direction: West

Comments:
SPL monitor location **ST1**, south of the southern-most existing cooling tower.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on right.)

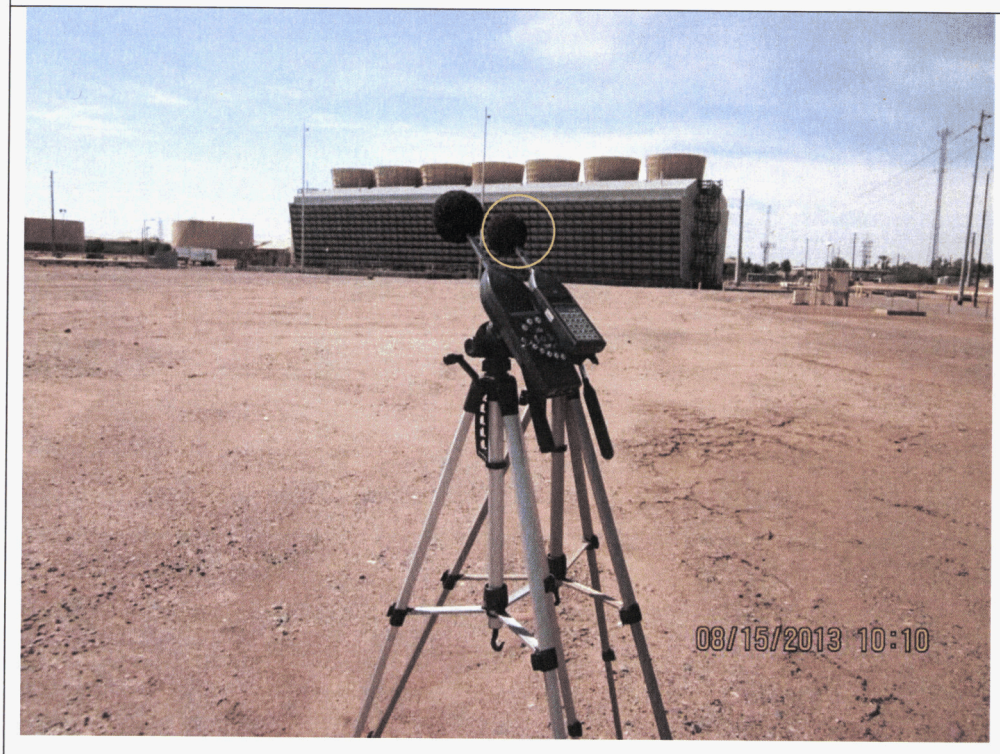
ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS

Photograph 7

Date: 08/15/13
GPS: 0414901/ 3698851
View Direction: East

Comments:
SPL monitor location **ST2**, west of the existing gas combustion turbines.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)



Photograph 8

Date: 08/15/13
GPS: 0414901/ 3698851
View Direction: South

Comments:
SPL monitor location **ST2**, north of the northern-most existing cooling tower.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS

Photograph 9

Date: 08/15/13
GPS: 0414997/ 3698963
View Direction: Southeast

Comments:
SPL monitor location **ST3**, north of the northern-most existing gas combustion turbine.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

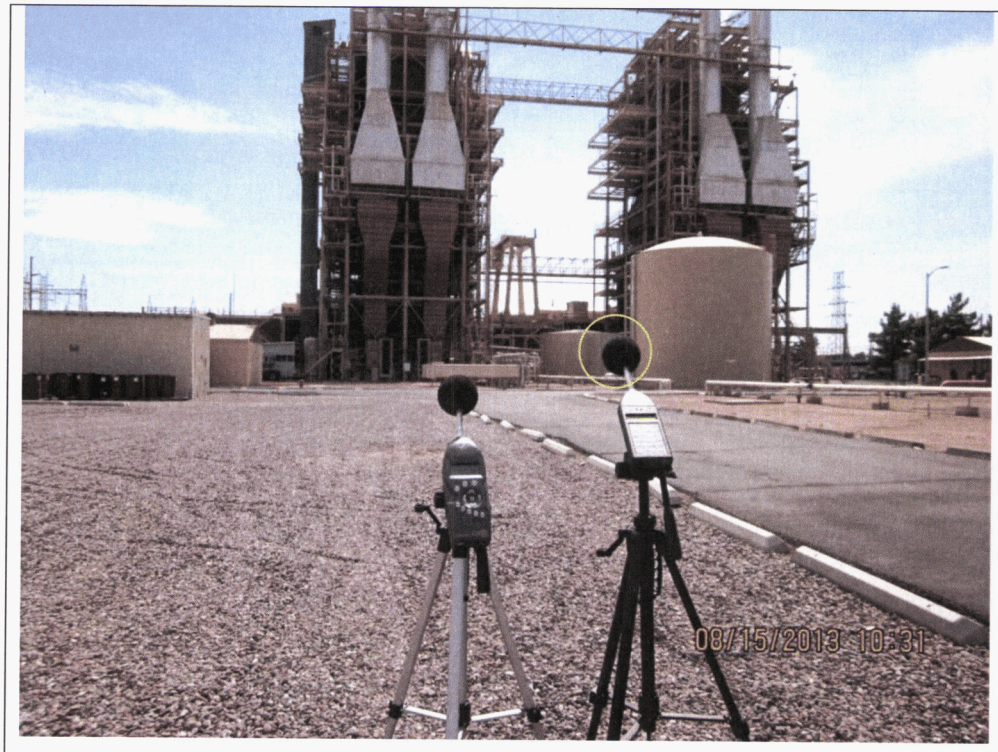
Photograph 10

Date: 08/15/13
GPS: 0414997/ 3698963
View Direction: South

Comments:
SPL monitor location **ST3**, north of the northern-most existing gas combustion turbine.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS



Photograph 11

Date: 08/15/13
GPS: 0415073/ 3698816
View Direction: East

Comments:
SPL monitor location **ST4**, east of the existing gas combustion turbines.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

Photograph 12

Date: 08/15/13
GPS: 0415073/ 3698816
View Direction: Southwest

Comments:
SPL monitor location **ST4**, east of the existing gas combustion turbines.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on right.)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS

Photograph 13

Date: 08/15/13
GPS: 0415999/ 3698747
View Direction: North

Comments:
SPL monitor location **ST5**, south of the southern-most existing gas combustion turbine.

(Windscreened SLM microphone encircled. Photograph taken with concurrent octave-band capable SLM on left.)

Photograph 14

Date: 08/15/13
GPS: 0415999/ 3698747
View Direction: East

Comments:
SPL monitor location **ST5**, south of the southern-most existing gas combustion turbine.

(Photograph taken with concurrent octave-band capable SLM on left.)

ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS

Photograph 15

Date: 08/15/13
GPS: 0415113/ 3698638
View Direction: North

Comments: SPL monitor location **ST6**.

Photograph 16

Date: 08/15/13
GPS: 0415113/ 3698638
View Direction: South

Comments: SPL monitor location **ST6**.

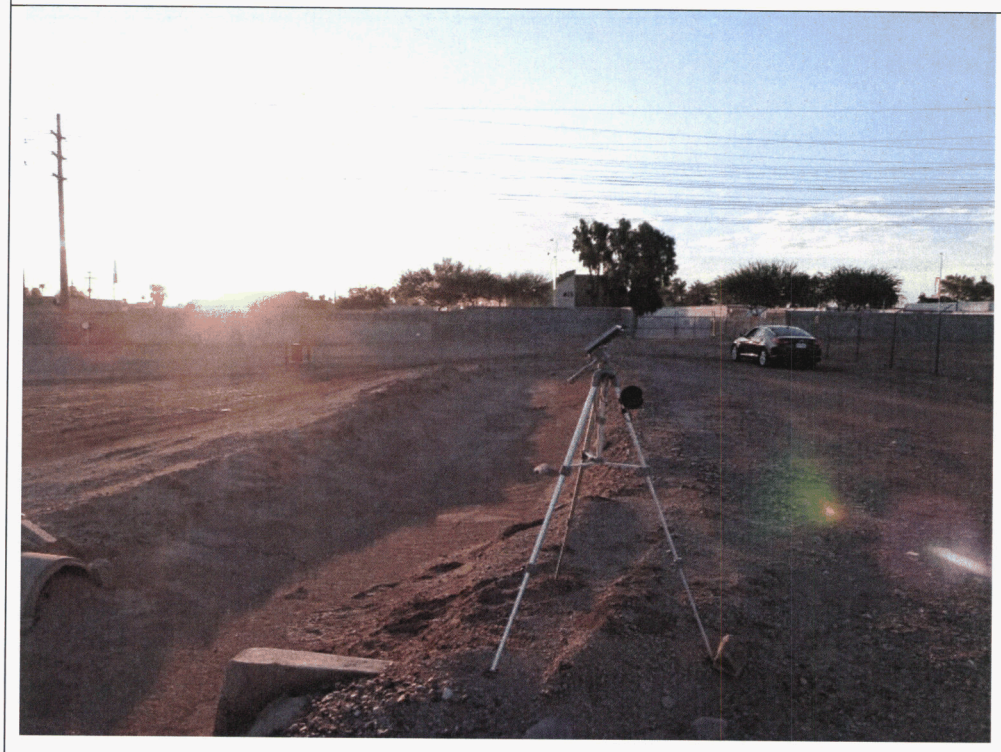
ATTACHMENT I-1
PHOTOGRAPHS OF NOISE SURVEY POSITIONS

Photograph 17

Date: 08/15/13
GPS: 0415414/ 3698884
View Direction: North

Comments:
SPL monitor location **ST7**, east of the existing steam-powered turbines.

(Windscreened SLM microphone encircled.)



Photograph 18

Date: 08/15/13
GPS: 0415414/ 3698884
View Direction: East

Comments:
SPL monitor location **ST7**, east of the existing steam-powered turbines.

(Windscreened SLM microphone encircled.)

ATTACHMENT I-2 – PLOTS OF Leq AT SOUND MONITORING POSITIONS

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

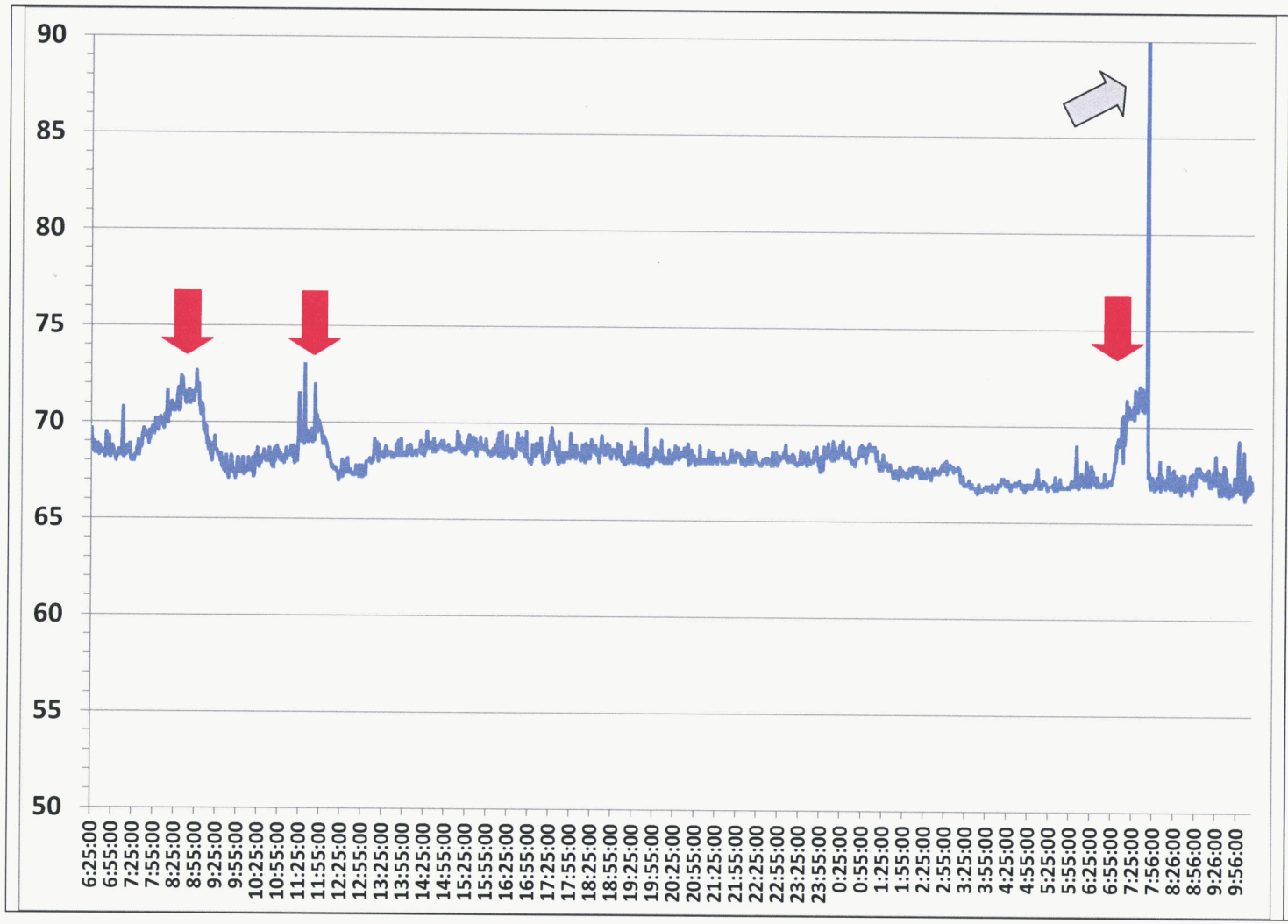


Figure 1

Description: L_{eq} (dBA) at SPL monitoring position **ST1**

GPS: 0414862/ 3698589

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); SLM calibration check signal (grey arrow).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

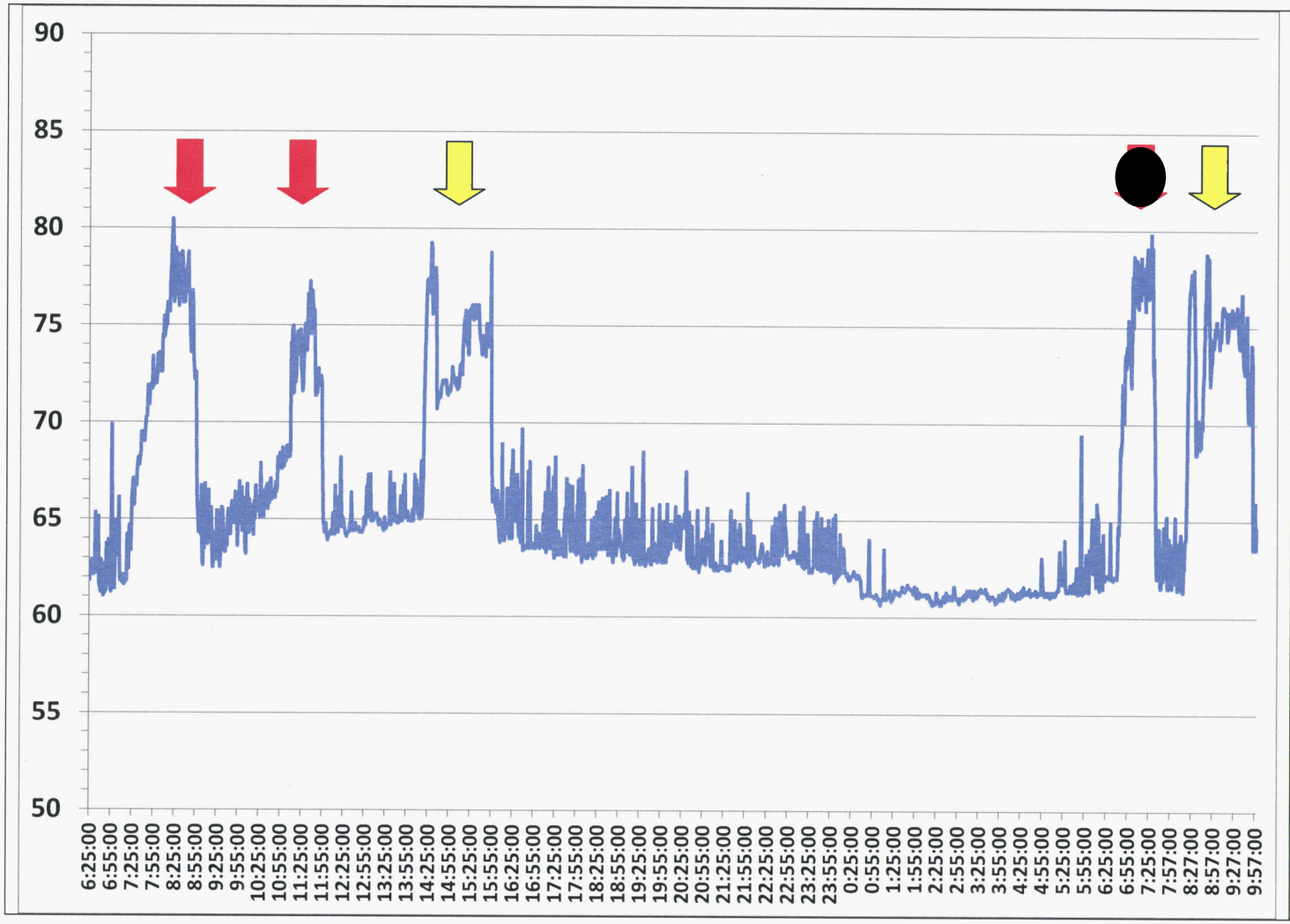


Figure 2

Description: L_{eq} (dBA) at SPL monitoring position **ST2**

GPS: 0414901/ 3698851

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

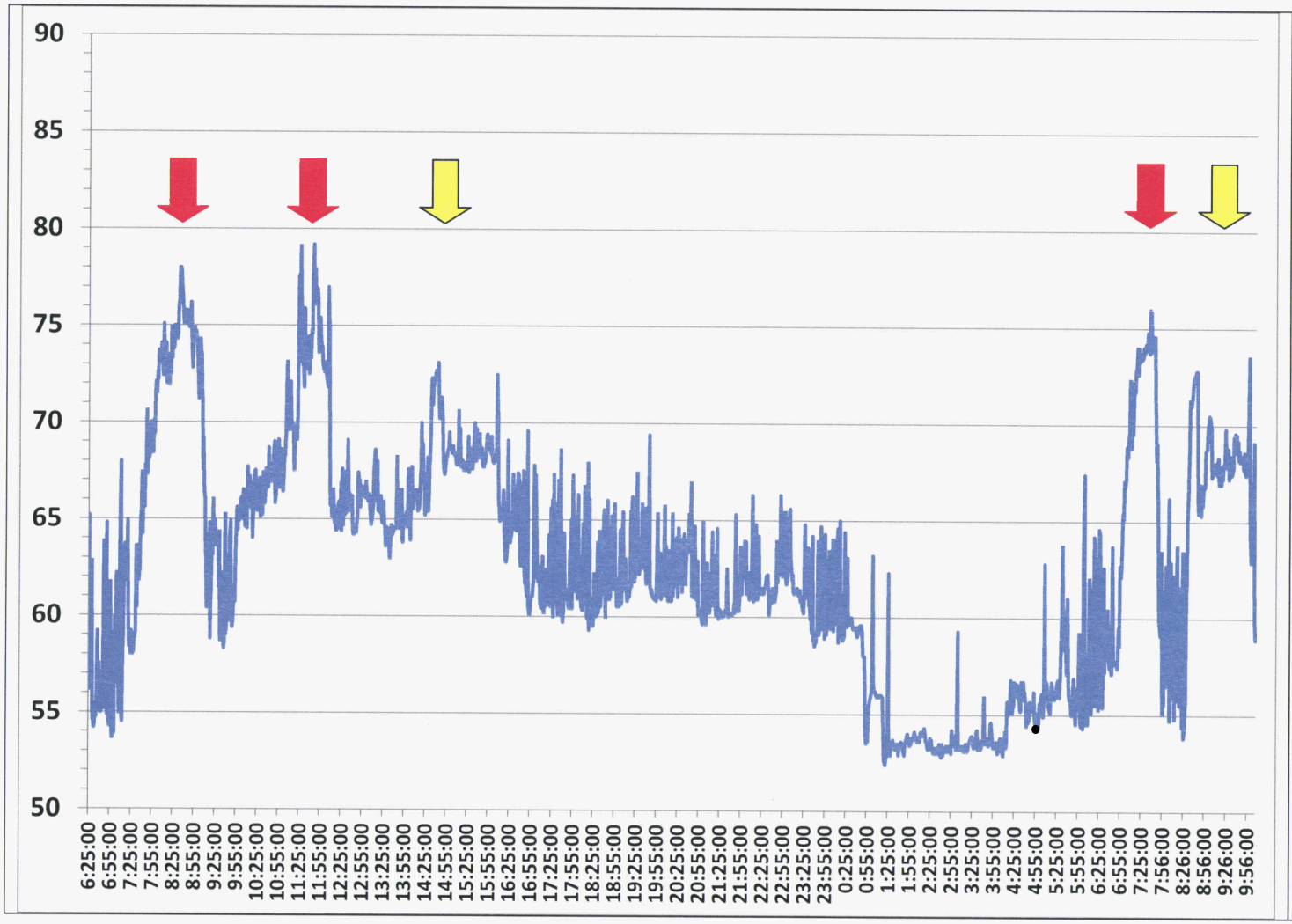


Figure 3

Description: L_{eq} (dBA) at SPL monitoring position **ST3**

GPS: 0414997/ 3698963

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

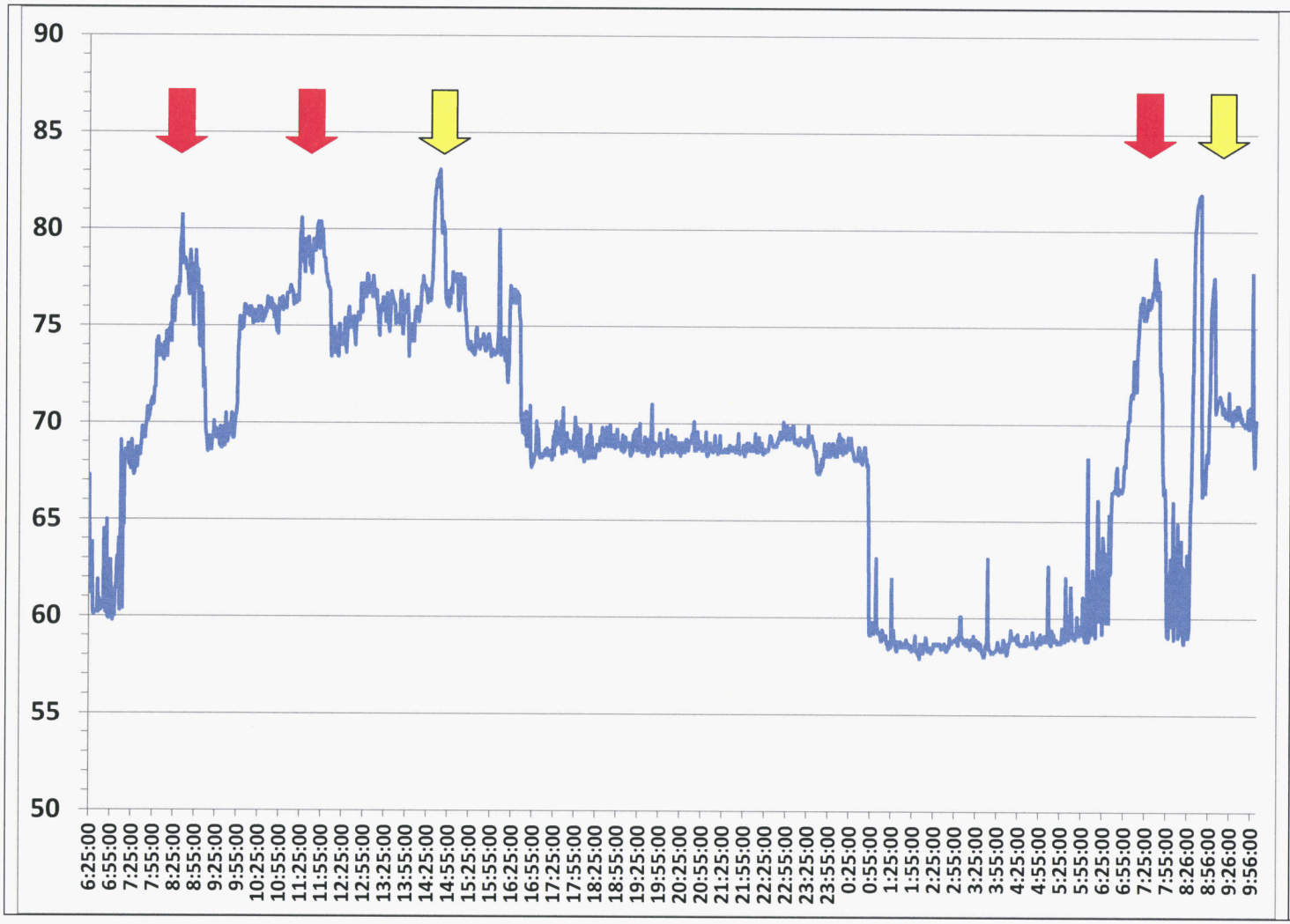


Figure 4

Description: L_{eq} (dBA) at SPL monitoring position **ST4**

GPS: 0415073/ 3698816

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

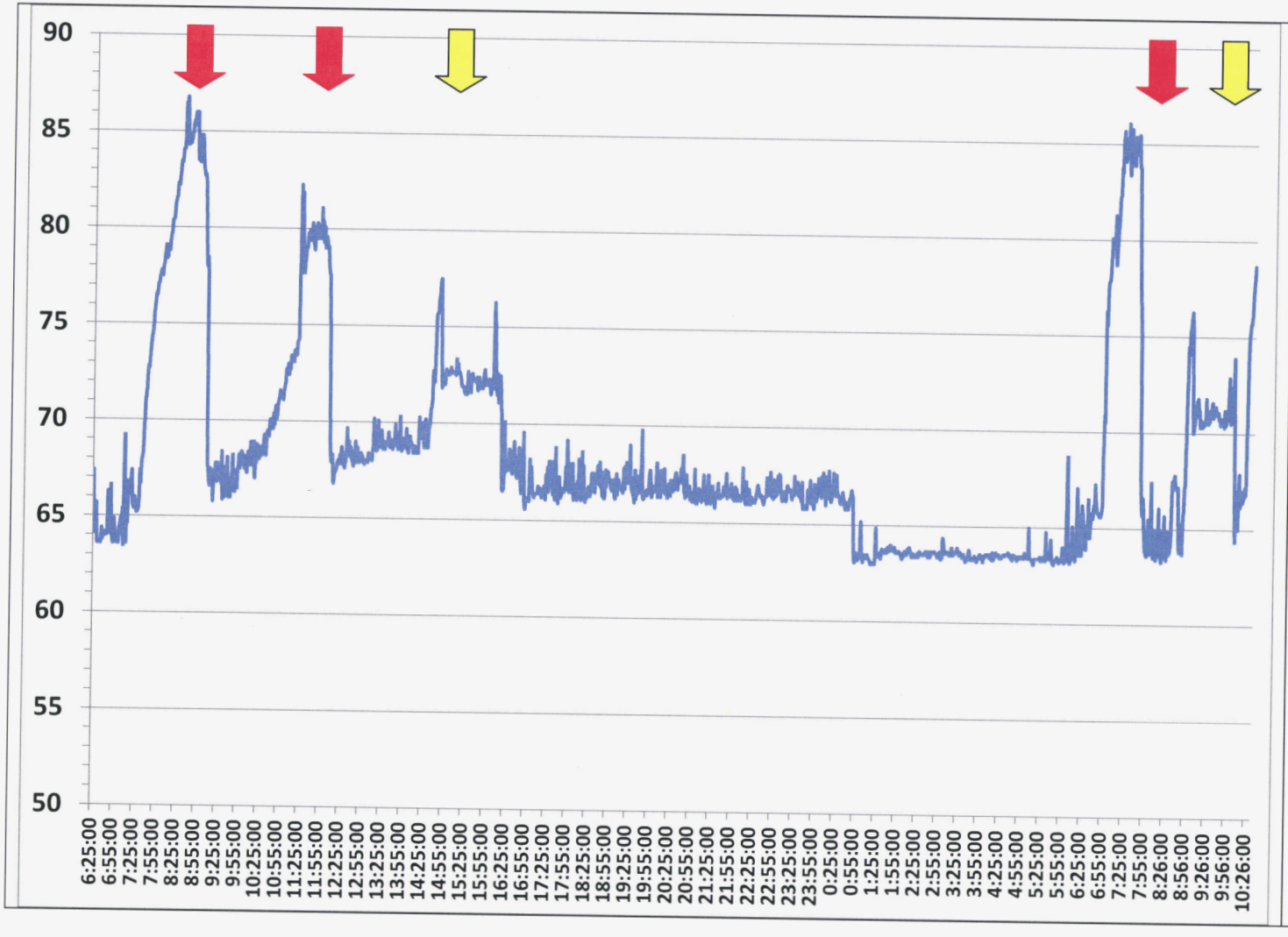


Figure 5

Description: L_{eq} (dBA) at SPL monitoring position **ST5**

GPS: 0415999/ 3698747

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

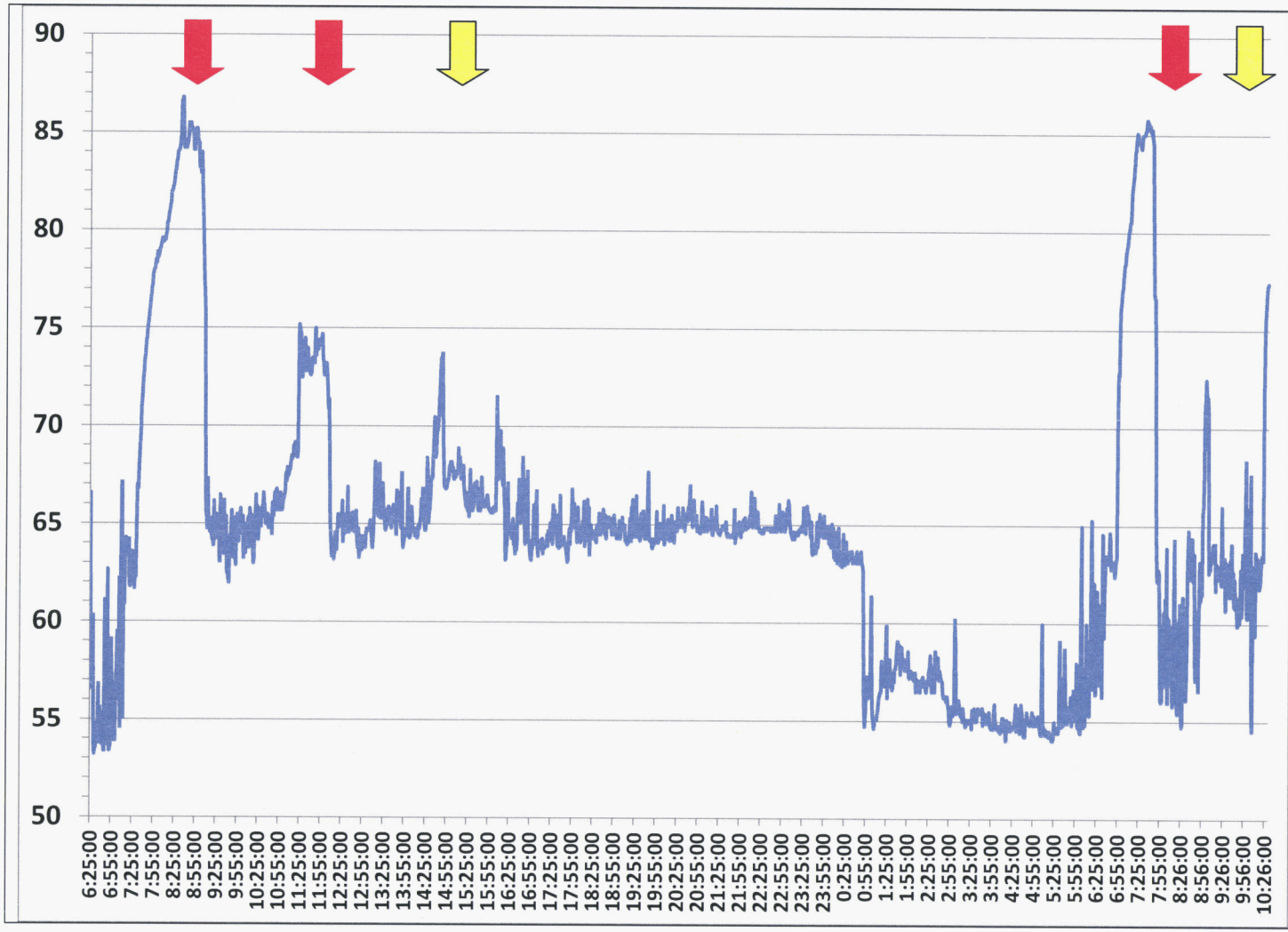


Figure 6

Description: L_{eq} (dBA) at SPL monitoring position **ST6**

GPS: 0415113/ 3698638

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

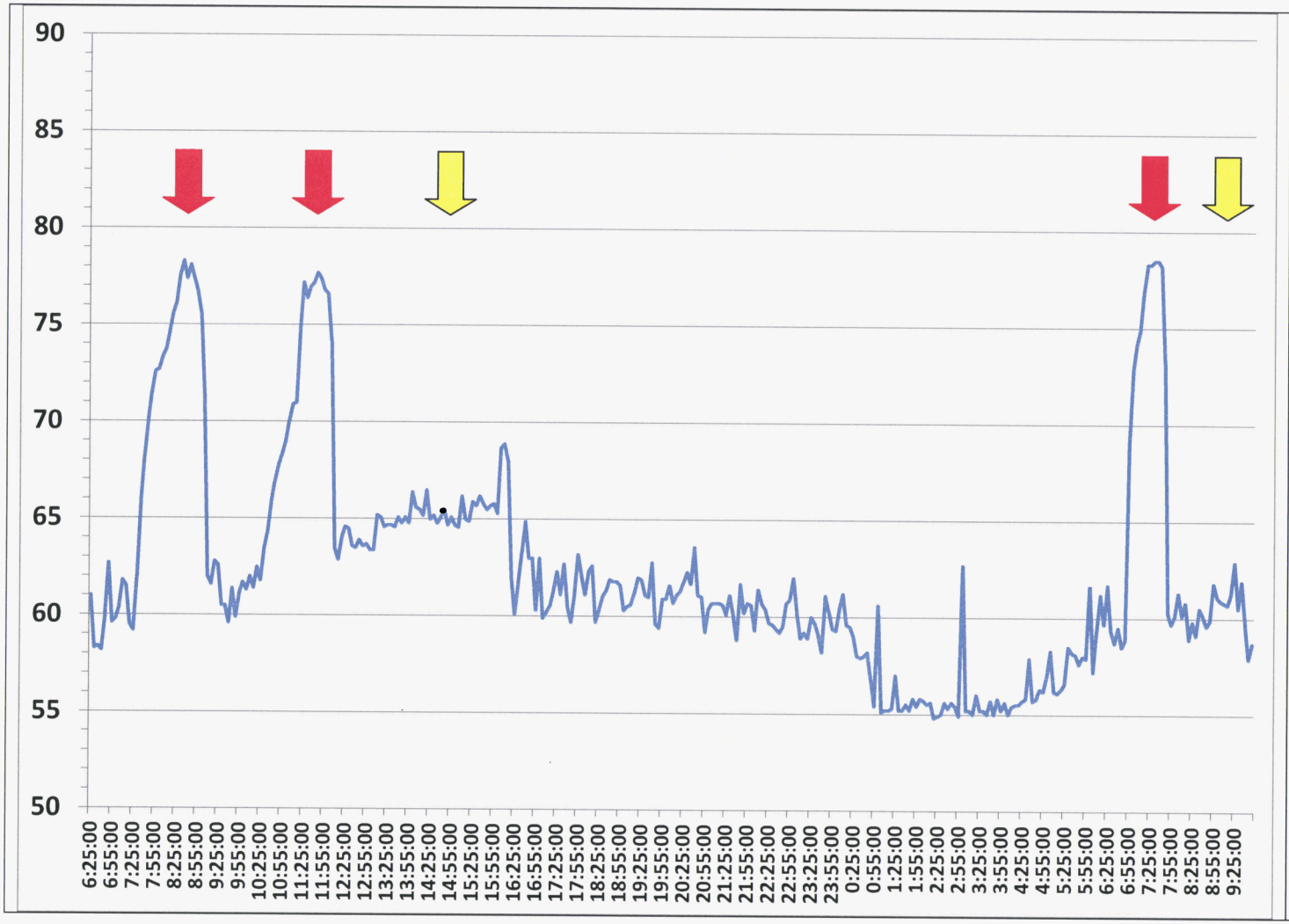


Figure 7

Description: L_{eq} (dBA) at SPL monitoring position **ST7**

GPS: 0415414/ 3698884

Date(s): August 15-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

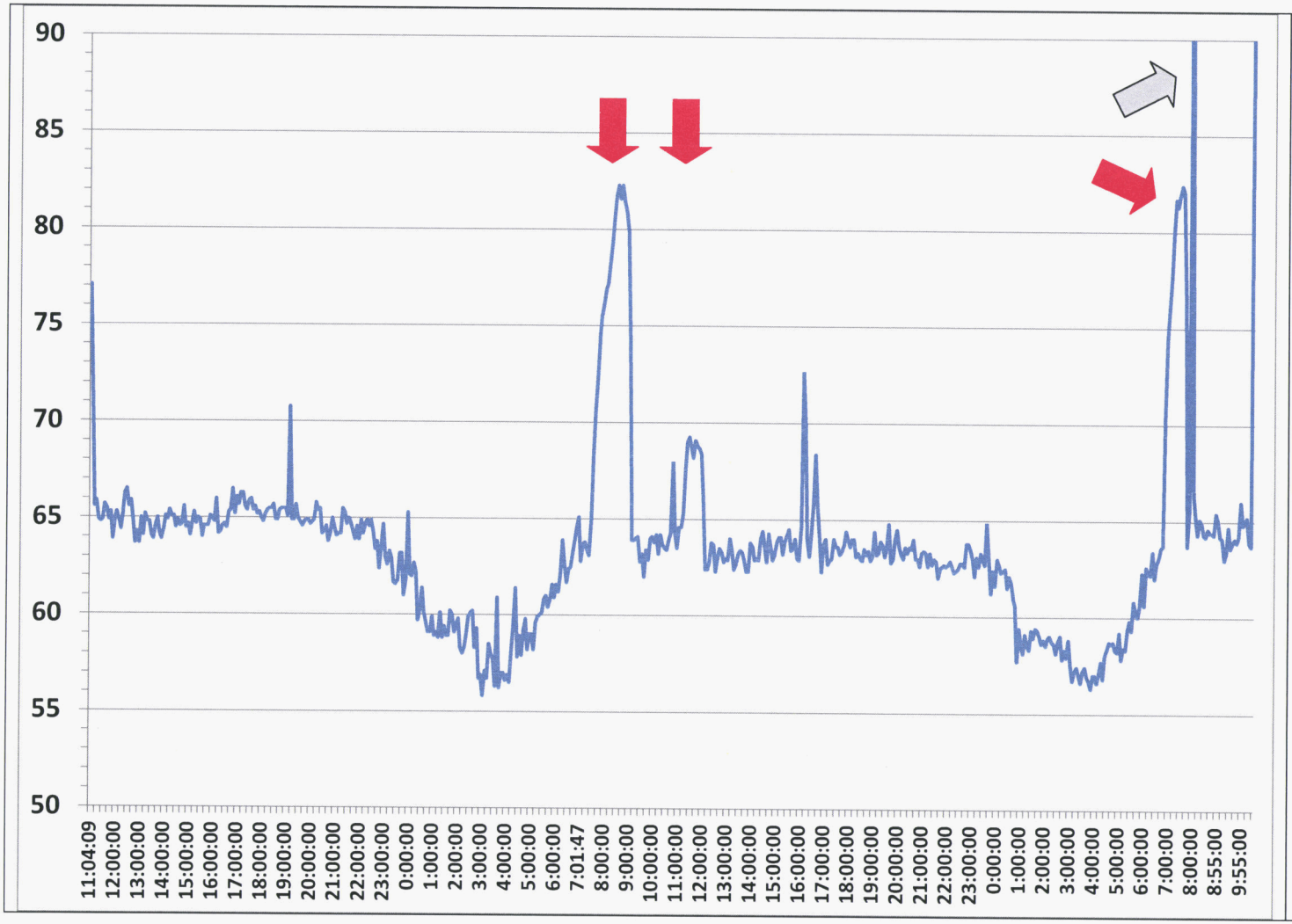


Figure 8

Description: L_{eq} (dBA) at SPL monitoring position **LT1**

GPS: 0415120/ 3698470

Date(s): August 14-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); SLM calibration check signal (grey arrow).

ATTACHMENT I-2
PLOTS OF L_{EQ} AT SOUND MONITORING POSITIONS

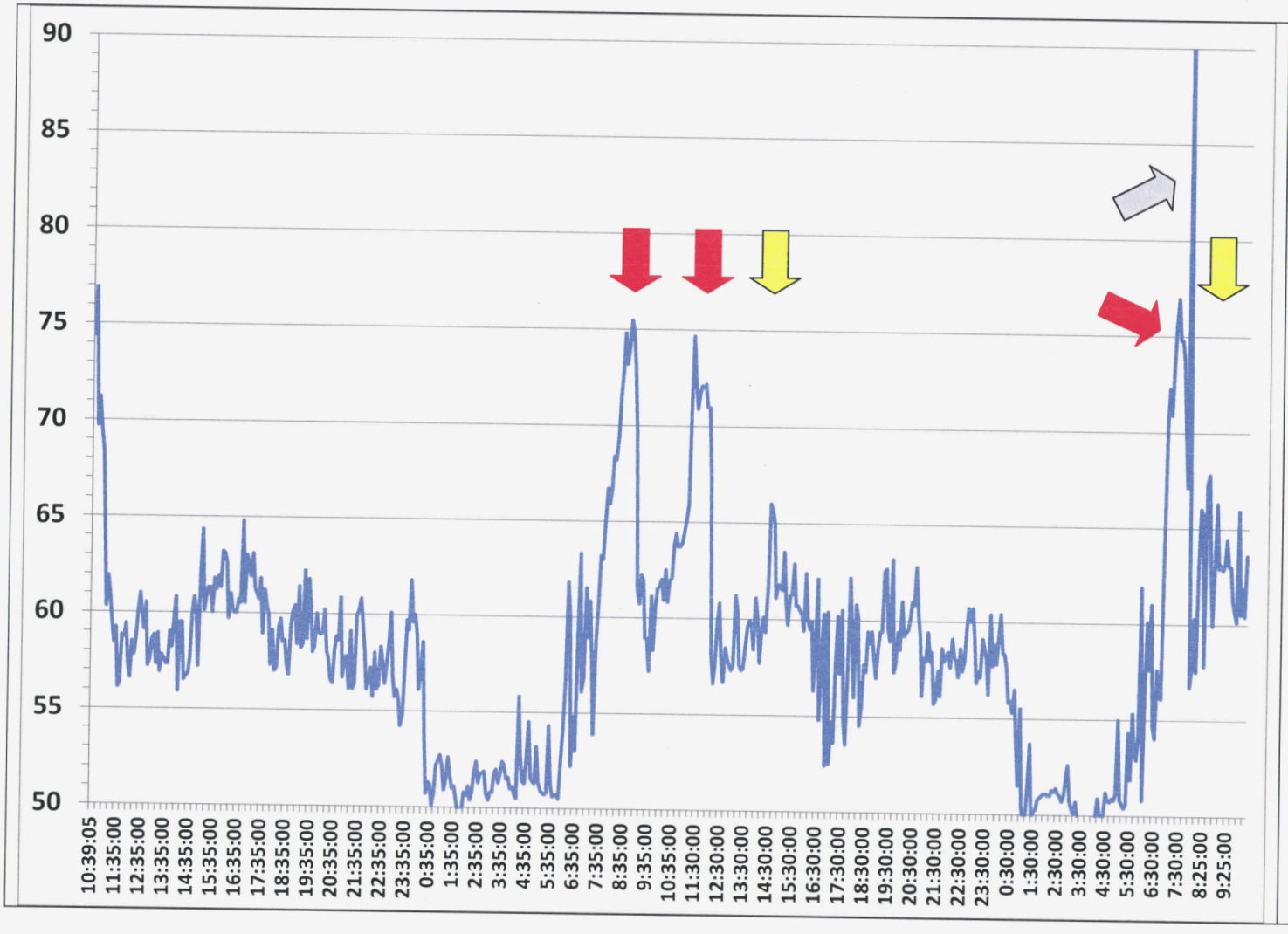


Figure 9

Description: L_{eq} (dBA) at SPL monitoring position **LT2**

GPS: 0414749/ 3698765

Date(s): August 14-16, 2013

Comments: Steam turbine ramp-up noise prominence (red arrows); gas turbine ramp-up noise prominence (yellow arrows); SLM calibration check signal (grey arrow).

EXHIBIT J – SPECIAL FACTORS

Arizona Revised Statutes ("ARS") §40-360 et seq. established the Power Plant and Transmission Line Siting Committee in 1971. ARS §40-360.06(A)(9) stipulates "any additional factors that require consideration under applicable federal and state laws pertaining to any such site" are among the factors the Siting Committee must consider in reviewing CEC applications. As stated in Arizona Corporation Commission Rules of Practice and Procedure R14-3-219,

> *"Describe any special factors not previously covered herein, which applicant believes to be relevant to an informed decision on its application."*

INTRODUCTION

APS has long-established relationships with the City of Tempe, Arizona State University, and community surrounding the Ocotillo Power Plant. As a result of those ongoing relationships, APS conducted, and will continue to conduct, agency and public outreach efforts as part of the Ocotillo Power Plant Modernization Project ("Project"). These outreach efforts included providing information about the Project to jurisdictional and agency representatives, community stakeholders, and the general public, and providing those entities and individuals opportunities to comment. This exhibit documents the public outreach completed for the Project, including the following:

- Stakeholder Briefings
- Agency Correspondence
- Direct Mail of Project Information
- Newspaper Notices
- Open House Meeting
- Project Website
- Social Media
- Newspaper Articles

STAKEHOLDER BRIEFINGS

The objective for the stakeholder briefings was to introduce the Project to public officials and interested stakeholders, solicit potential concerns or feedback, and to emphasize APS's desire to maintain open dialogue regarding the Project.

The briefings included an overview of plans to modernize the Ocotillo Power Plant, including replacing the units placed in service in 1960 with five new turbines. Stakeholders were informed that natural gas will still be the source fuel and that the CEC Process is underway and public outreach will be a key component of the process. A description of the need for the Project, its location (including rendering of the current and proposed facilities), the Project schedule, opportunities for public involvement, and APS contact information were also provided. A copy of the briefing presentation is provided as Attachment J-1.

Briefings were conducted separately with entities that are listed below (see Table J-1, current through July 18, 2014). There were no significant concerns identified during the briefings and follow-on briefings were held with stakeholders as requested.

Table J-1. Stakeholder Briefings

AGENCY MEETINGS AND OFFICIAL BRIEFINGS			
Date	**Agency/Entity**	**Contact/Represented By**	**APS Representative(s)**
STATE			
01-29-14	Arizona Corporation Commission	Chairman Bob Stump	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
01-29-14	Arizona Corporation Commission	Commissioner Gary Pierce	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
01-29-14	Arizona Corporation Commission	Commissioner Brenda Burns	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
Phone 01-29-14	Arizona Corporation Commission	Commissioner Susan Bitter Smith	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
01-29-14	Arizona Corporation Commission	Commissioner Bob Burns	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
Phone 01-30-14	Line Siting Committee	John Foreman, Chairman	James Wilde, Stacy Aguayo, Linda Benally and Bob Smith
Phone 01-31-14	Arizona Corporation Commission	Commissioner Susan Bitter Smith	James Wilde, Stacy Aguayo, Pat Dinkel and Bob Smith
01-31-14	Arizona State University – Government Affairs	Morgan Olsen, Keith Walton and Angela Creed	Stephanie Whyte and Michelle Gettinger
02-03-14	Arizona Corporation Commission Staff	Steve Olea and Members of the Utilities Division Staff and Legal	James Wilde, Stacy Aguayo, Pat Dinkel, Greg Bernosky and Bob Smith
04-15-14	Residential Utility Consumer Office (RUCO)	Pat Quinn, Dan Pozefsky and Lon Huber	Barbara Lockwood, Greg Bernosky, James Wilde and Bob Smith
05-21-14	Arizona State University – Real Estate Office	John Creer, Assistant Vice President	Randy Clawson, along with Jennifer Frownfelter and Chelsa Weatherbee of URS.
06-24-14	Governor's Office of Energy Policy	Leis Brug, Director Adam McNally, Sr. Policy Advisor Olivia Doherty, Sr. Policy Coordinator	Michael Vargas, Brent Gifford and Theresa Rakowsky
07-01-14	Arizona Corporation Commission	Commissioner Bob Burns	Barbara Lockwood and James Wilde
07-01-14	Arizona Corporation Commission	Commissioner Gary Pierce	Barbara Lockwood and James Wilde
07-02-14	Residential Utility Consumer Office (RUCO)	Pat Quinn, Lon Huber and Dan Pozefsky	Barbara Lockwood, James Wilde and Thomas Loquvam
07-17-14	Arizona Corporation Commission	Commissioner Brenda Burns	Barbara Lockwood and James Wilde
COUNTY			
02-07-14	Maricopa County Board of Supervisors	Denny Barney, District 1	Frank McCune and Meg Leal
02-07-14	Maricopa County Board of Supervisors	Steve Chucri, District 2	Frank McCune and Meg Leal
02-07-14	Maricopa County Board of Supervisors	Andy Kunasek, District 3	Frank McCune and Meg Leal
02-07-14	Maricopa County Board of Supervisors	Clint Hickman, District 4	Frank McCune and Meg Leal
02-07-14	Maricopa County Board of Supervisors	Mary Rose Wilcox, District 5	Frank McCune and Meg Leal

AGENCY MEETINGS AND OFFICIAL BRIEFINGS			
Date	**Agency/Entity**	**Contact/Represented By**	**APS Representative(s)**
02-07-14	Maricopa County Air Quality Department	Richard Sumner, Henry Krautter and Scott Treece	Chas Spell and Anne Carlton
05-22-14	Maricopa County Air Quality Department	Richard Sumner, Henry Krautter and Scott Treece	Chas Spell and Anne Carlton URS representative Chelsa Weatherbee
06-19-14	Maricopa County Planning & Development Department	Ray Banker	URS representative Chelsa Weatherbee
06-24-14	Maricopa County Air Quality Department	Richard Sumner, Henry Krautter and Scott Treece	Chas Spell and Anne Carlton
LOCAL			
01-30-14	City of Tempe	Mayor Mark Mitchell	Mark Schiavoni, Stephanie Whyte and Jessica Pacheco
01-30-14	City of Tempe	Shana Ellis, Councilmember	Stephanie Whyte and Michelle Gettinger
01-31-14	City of Tempe	Kolby Granville, Councilmember	Stephanie Whyte and Michelle Gettinger
01-31-14	City of Tempe	Onnie Shekerjian, Councilmember	Stephanie Whyte and Michelle Gettinger
Email 01-31-14	Tempe Chamber Director	Mary Ann Miller	Stephanie Whyte and Michelle Gettinger
02-03-14	City of Tempe	Robin Arredondo- Savage, Councilmember	Stephanie Whyte and Michelle Gettinger
02-03-14	City of Tempe	Corey Wood, Councilmember	Stephanie Whyte and Michelle Gettinger
02-03-14	City of Tempe	Joel Navarro, Councilmember	Stephanie Whyte and Michelle Gettinger
02-03-14	City of Tempe	Andrew Ching, City Manager Jeff Kulaga, Asst. City Manager	Stephanie Whyte and Michelle Gettinger
02-03-14	City of Tempe Historical Society	Richard Bauer, President	Stephanie Whyte and Michelle Gettinger
02-11-14	City of Scottsdale	Mayor Jim Lane	Vern Braaksma and Jessica Pacheco
04-09-14	City of Tempe – City Manager's Office	Andrew Ching ,City Manager Jeff Kulaga, Asst. City Manager	Brent Gifford, Michelle Gettinger, Randy Clawson and Josh Ahrens
04-23-14	City of Tempe – Department of Public Works; Department of Community Development	Don Bessler, David Nakagawara, Carla Sidi, Andy Goh, Julian Dressang and John Osgood	Brent Gifford, Randy Clawson and Josh Ahrens
05-08-14	City of Tempe	Nancy Ryan, Project Manager Coordinator	URS representatives Jennifer Frownfelter and Chelsa Weatherbee
05-27-14	City of Tempe – Department of Public Works; Department of Community Development	Steve Abrahamson, Don Bessler, Marilyn DeRosa, Andy Goh, Cathy Hollow, Lisa Loyd, David Nakagawara, John Osgood, Mark Weber and Tom Wilhite	Brent Gifford, Andrew Federico, Scott McLellan, Michelle Gettinger, Randy Clawson, Tom Livingston and Josh Ahrens
05-28-14	City of Tempe	Ryan Levesque	URS representative Chelsa Weatherbee
06-19-14	City of Mesa	Wahid Alam	URS representative Chelsa Weatherbee
07-09-14	City of Scottsdale	Ross Cromarty	URS representative Chelsa Weatherbee

AGENCY MEETINGS AND OFFICIAL BRIEFINGS			
Date	**Agency/Entity**	**Contact/Represented By**	**APS Representative(s)**
TRIBAL			
06-17-14	Salt River Pima-Maricopa Indian Community	Janice See	URS representative Chelsa Weatherbee
07-18-14	Four Southern O'odham Tribes – Cultural Resources Working Group	Representatives from Ak-Chin Indian Community, Gila River Indian Community, Tohono O'odham Nation, Salt River Pima-Maricopa Indian Community	Jon Shumaker
OTHER			
Phone 01-30-14	Salt River Project	Rob Taylor	Stacy Aguayo
Email 01-31-14	Huellmantel & Affiliates, LLC Developer / Property Owner	Charles Huellmantel	Stephanie Whyte and Michelle Gettinger
01-31-14	Arizona Competitive Power Alliance	Greg Patterson	Jeff Guldner and Pat Dinkel

AGENCY CORRESPONDENCE

Formal invitations were extended via letter and telephone to the open house. A Project newsletter was included with the letter along with additional specific follow-up and requests.

APS received several responses to the agency notification letters. These responses are summarized in Table J-2 below; all agency correspondence documentation is provided as Attachment J-2.

Table J-2. Agency Correspondence

Date of Response	Agency/Entity	Summary of Response
01-21-14	Arizona Department of Water Resources	Agrees with APS interpretation that combustion turbine units would not fall under the definition of large scale power plants, and would not be regulated under the Third Management Plan (regulating use of groundwater in an Active Management Area).
04-03-14	Arizona Game & Fish Department	Does not anticipate any significant adverse impacts to wildlife resources.
04-08-14	US Fish and Wildlife Service	Indicates that no endangered or threatened species or critical habitat will be affected by this Project; nor is the Project likely to jeopardize the continued existence of any proposed species or adversely modify any proposed critical habitat.
05-28-14	The Hopi Tribe	Requests opportunity to review any report of additional archaeological testing and treatment plans. Letter to APS references "We appreciate UDOT's continuing solicitation of our input" however the Hopi Tribe has confirmed that this was in error and should read "We appreciate APS continuing solicitation of our input."
06-04-14	Arizona State Historic Preservation Office	Concurs with adequacy of completed cultural resource studies, determination that the Ocotillo Power Plant is not eligible for the Arizona Register of Historic Places, and recommendations for further archeological testing.

Date of Response	Agency/Entity	Summary of Response
06-05-14	Gila River Indian Community	Defer to the Salt River Pima-Maricopa Indian Community as lead for consultations.
06-16-14	Yavapai Prescott Indian Tribe	Concurs with the adequacy of the cultural resource studies and supports proposal to conduct further archaeological testing in areas that were off-limits due to safety issues, as well as testing at depths greater than five feet in areas where that would be deemed appropriate.
06-23-14	Ft. McDowell Yavapai Nation	Verbal conversation indicating no significant concerns at this time and plan to provide feedback soon; no response letter received.
06-23-14	Pascua Yaqui	Verbal conversation indicating plans to discuss the project at a Tribal Council meeting and provide response; no response letter received.
06-24-14	Yavapai Apache Nation	Defer to other interested tribes via email conversation. Would like to be notified of any field visits.
07-11-14	Salt River Pima-Maricopa Indian Community	Will lead cultural resource consultations discovery consultation on behalf of the Four Southern Tribes of Arizona (that also include the Gila River Indian Community, the Ak-Chin Indian Community, and Tohono O'odham Nation). Agrees that completed cultural resource studies are adequate but additional archaeological data recovery is necessary. Requests to be notified when additional archaeological investigations begin.
07-11-14	Ak-Chin	No response letter; have deferred to Salt River Pima-Maricopa Indian Community as lead for consultations.
07-11-14	Tohono O'odham Nation	No response letter; have deferred to Salt River Pima-Maricopa Indian Community as lead for consultations.
07-14-14	Tempe Historic Preservation Office	Concurs with adequacy of completed cultural resource studies but maintains the Ocotillo Power Plant was historically important and its role in the development of Tempe circa 1958 to 1975 warrants more research. APS has agreed to provide funding to the Tempe Historic Preservation Office to support such research.

DIRECT MAIL OF PROJECT INFORMATION

In February 2014, APS sent a postcard to approximately 64,000 addresses within a 2-mile radius of the Ocotillo Power Plant. The postcard introduced the Project and provided the Project website address and an opportunity to sign-up for email updates.

In April 2014, APS sent a two-page newsletter to approximately 59,000 addresses within a 2-mile radius of the Ocotillo Power Plant. (The newsletter was sent to 5,000 fewer addresses than the postcard mailing as the mailing list was adjusted based on undeliverable postcards.) The newsletter included information about plant capacity, modernization features, need for the modernization, schedule and opportunities for public input. The newsletter also included an invitation to the open house and the Project website address.

A copy of the postcard and newsletter are provided in Attachment J-3.

NEWSPAPER NOTICES

The open house meeting was announced through newspaper notices published in the *Arizona Republic* Tempe/Ahwatukee zone, *ASU State Press*, *East Valley Tribune*, and *Prensa Hispana* reaching a total circulation of 290,342. A copy of all notices and affidavits of publication are provided in Attachment J-4.

OPEN HOUSE MEETING

On April 22, 2014, from 5:00 to 8:00 p.m., APS hosted a public open house at the ASU Karsten Golf Course Clubhouse located at 1125 East Rio Salado Parkway in Tempe. A team of nearly 20 APS employees and consultants staffed display boards and an interactive GIS station. A video was played continuously throughout the evening; it provided imagery showing the current and conceptual design features of the generation plant. During the open house, four written comments were received and added to the database of comments (see Attachment J-6). A copy of the meeting summary is provided in Attachment J-5 along with a copy of the fact sheet, comment form, and display boards made available at the meeting.

PROJECT WEBSITE

Project information and outreach materials were posted on the APS website azenergyfuture.com/ocotillo beginning in February 2014 (Attachment J-6). The website was periodically updated to ensure new materials were available. A total of 47 comments have been received through the website (through June 2014). No comments in opposition of the Project have been received; the majority provided support for modernization or mailing address updates, and some indicated interest in providing materials or services. A complete list of comments is provided in Attachment J-6.

SOCIAL MEDIA

Information about the Project, with links to the APS Project website, was promoted through Twitter and Facebook on February 17, 2014. Information about the open house was tweeted on April 21, 2014 and an advertisement for the open house was published on Facebook from April 16-21, 2014 (Attachment J-7). The Facebook advertisement reached 33,500 users in the Tempe area and resulted in more than 500 clicks to the Ocotillo web page.

NEWSPAPER ARTICLES

Newspaper articles were published in *The Arizona Republic* (February 15, 2014), *La Voz* (February 21, 2014), *East Valley Tribune* (February 25, 2014), *Ahwatukee Foothills News* (February 25, 2014) and *The State Press* (February 26, 2014) that provided information on the modernization of the plant. Copies of the articles are provided as Attachment J-8.

APPENDIX J-1 – STAKEHOLDER BRIEFING MATERIALS

Ocotillo Modernization Project

Reliability, Location, Technology

February 2014

aps

Purpose

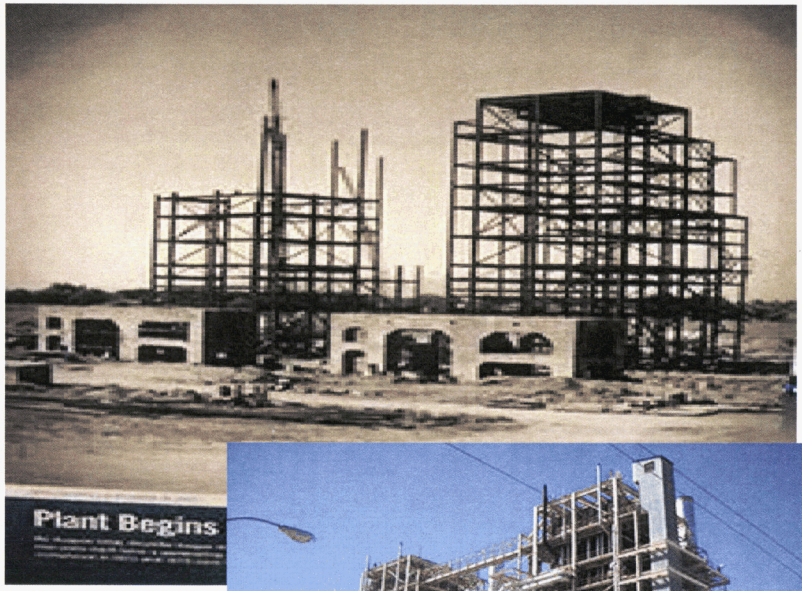
- Overview and Importance of Ocotillo Power Plant
- Project to Modernize the Plant
- Relationship to Valley Electric Grid
- Evolving Customer Demand and Markets
- Timeline for Next Steps

aps

Ocotillo Power Plant

NW Corner of University and McClintock

- 1960's era natural gas generating plant
- Played significant role in bringing power to growing Phoenix area
- Critical for grid reliability
- Since then, modern natural gas generating units have become much more responsive and efficient
- Today, the steam unit's role has evolved



- Ocotillo Site Output 330 MW
  - Two Westinghouse 110 MW steam units
    - Constructed 1960
  - Two Westinghouse 55 MW combustion turbines
    - Constructed 1972/73

aps

Ocotillo Modernization Project

- Retire existing steam units (220 MW) constructed in 1960
- Replace aging steam units with modern combustion turbines
  - Install five General Electric LMS 100 combustion turbines – 102 MW each
  - Transmission and natural gas pipeline infrastructure optimized
  - Net site capacity increased by 290 MW to 620 MW total
- Maintain Valley reliability
  - Generation close to load center
  - Contingency and voltage support
- Responsive unit operations
  - Quick starting and ramping
  - Renewable integration
- Environmental attributes
  - Emissions and water consumption
- In-service planned for summer 2018

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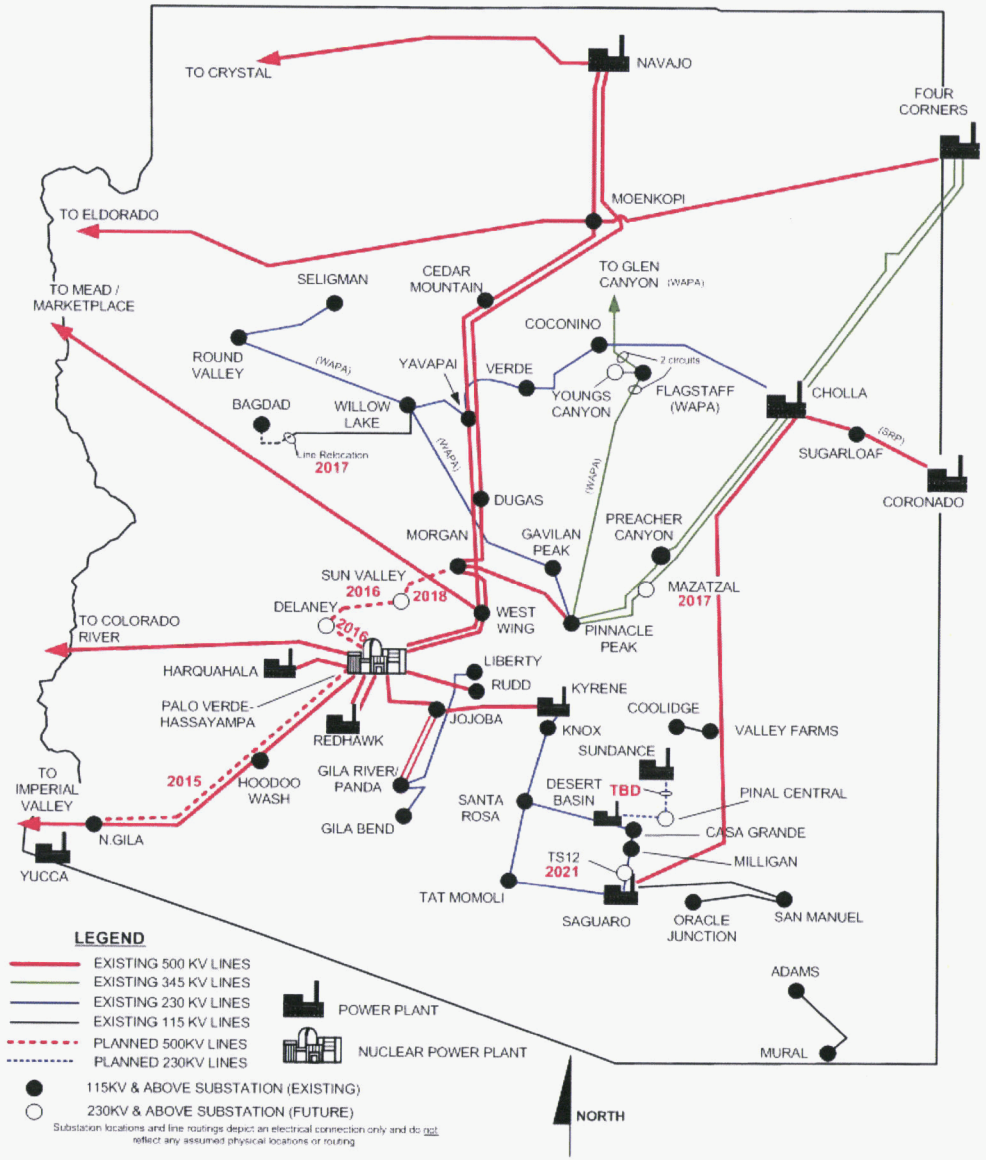
Generation and Transmission System Balance



- Electric generating resources help balance the flow of power around the state
- Grid built to balance sources of energy
  - Palo Verde and natural gas generators are located West of Valley while coal generators are located North and East
- Generation additions or retirements change this balance
- Generation close to customer demand center (metro-Phx) improves transmission import capabilities and maintains a balanced system

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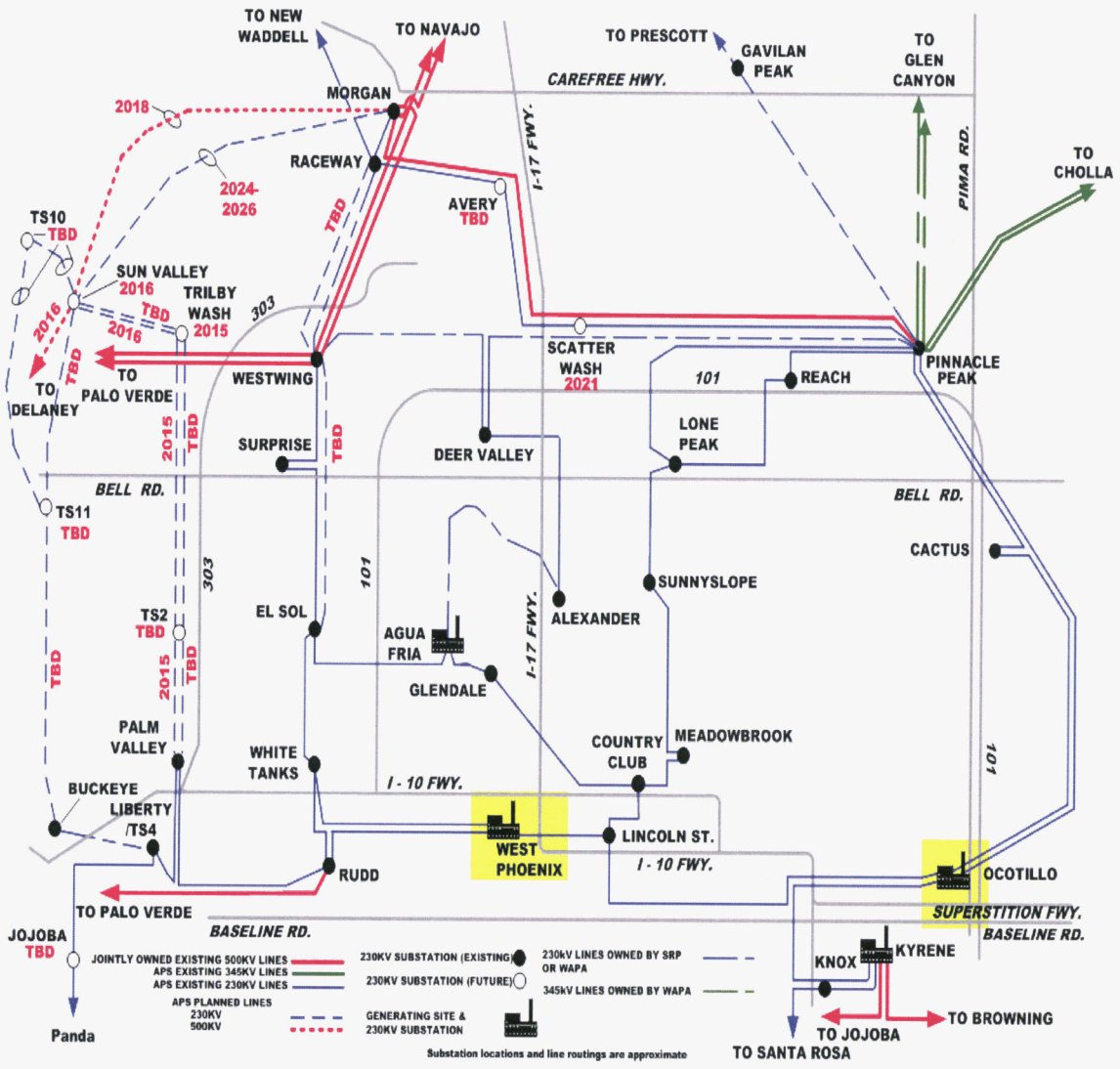
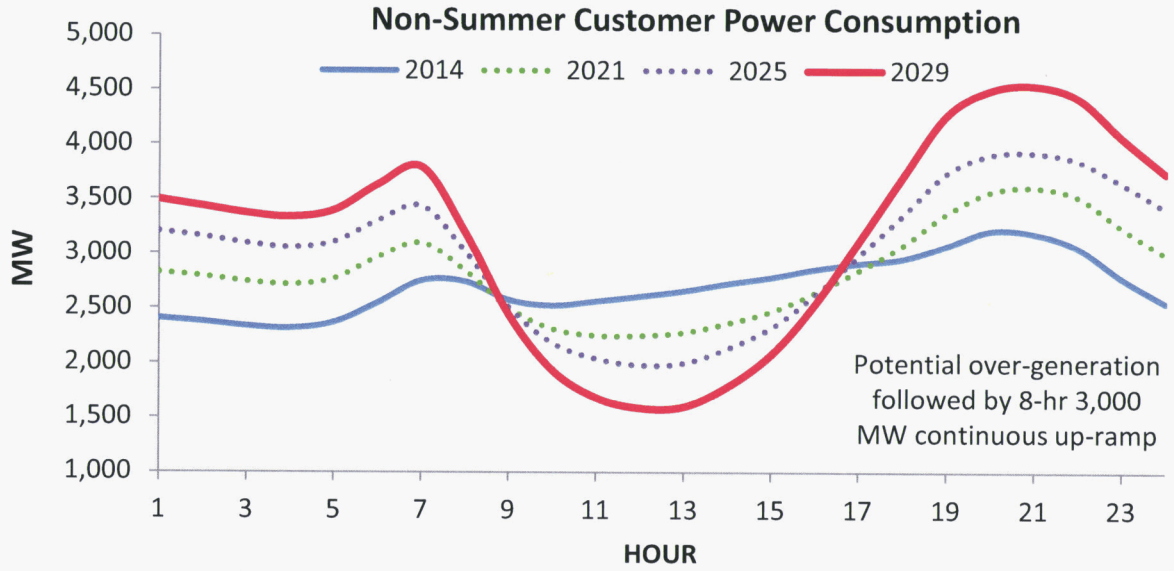
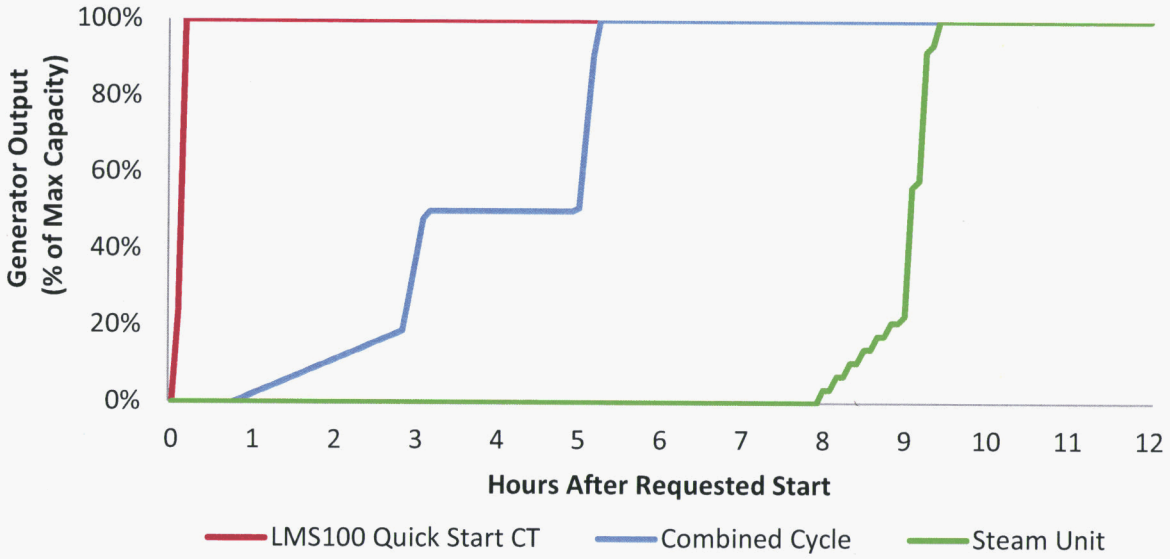
Benefits of Generation Inside a Load Pocket



- A load pocket is an area of demand that requires local resources to meet peak demand
- APS and SRP coordinate to serve combined Phoenix load pocket
- Advantages of local generation:
  - Provide voltage support for high demand and contingency conditions
  - Relieve transmission lines under contingency conditions
  - Grid benefits for A/C demands
  - Support future load growth in the load pocket

Evolving Customer Demand and Markets





- Growth of solar PV is dramatically changing customer energy consumption patterns
- Generators must be able to start and stop multiple times per day
- Fast starting and ramping capability is required in responding to variable output of renewable resources

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Next Steps

- Stakeholder engagement ***(begin February 2014)***
  - Community leader briefings
  - Public open house meetings
  - Mailings, website, and related media
- Initiate permitting activities ***(begin March 2014)***
  - Local/site permits with City of Tempe and Maricopa County
- Prepare Certificate of Environmental Compatibility (CEC)
  - File application ***(August 2014)***
  - ACC Siting Committee hearings ***(expected October 2014)***

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Ocotillo Project Summary

- Maintains system reliability in Valley through replacement of aging steam units
- Replacement units to meet needs for increased portfolio responsiveness
- Optimizes existing infrastructure
- Improves visual considerations through lower structures
- Environmental attributes
- Local jobs and increased tax base

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APPENDIX J-2 – AGENCY CORRESPONDENCE

aps *A subsidiary of Pinnacle West Capital Corporation*

Robert Lotts
Water Resource Planning
Manager

Tel. 602-250-3905
Fax 602-250-4494
e-mail: Robert.lotts@aps.com

Mail Station 9424
PO Box 53999
Phoenix, Arizona 85072-3999

January 17, 2014

Mr. Jeff Tannler
Statewide AMA Director
Arizona Department of Water Resources
3550 N Central Ave
Phoenix, AZ 85004

RE: Third and Fourth Management Plan

Dear Mr. Tannler,

Arizona Public Service Company ("APS") would like to take this opportunity to follow up on our conversations over the last few months regarding proposed changes to the Arizona Department of Water Resources' ("ADWR") Fourth Management Plan ("4MP"). As you know, APS's review of ADWR's Third Management Plan ("TMP") has identified an interpretation that could be confusing in the conservation requirements for combustion turbines ("CTs") under TMP Chapter 6.5 "Large Scale Power Plants." TMP Chapter 6.5 addresses power generation through the Rankin Steam Cycle utilizing cooling towers for the dissipation of heat load from condensing steam. The requirement associated with this process is to achieve a minimum of 15 cycles of concentration ("COC") for power plants built after 1984. As it is currently written, APS's interpretation of the TMP is that CTs do not qualify as large scale power plants under Chapter 6.5. CTs operate differently from thermoelectric generating units. Rather than using steam to drive a turbine, CTs harness the nature of air to expand when it is heated. The expanding air pushes the turbine, which turn the electric generators. Because CTs require less cooling (having no steam to condense), the overall system requires much less water than traditional steam electric technologies and fit more with the requirements of Chapter 6.6 "Large Scale Cooling Facilities." TMP Chapter 6.6 imposes conservation requirements on large scale cooling facilities that require each fully operational cooling tower to achieve a COC level that results in blowdown water being discharged at an average annual minimum of either 120mg/l silica or 1,200 mg/l total hardness, whichever is reached first. APS feels CTs are better aligned with Chapter 6.6 rather than Chapter 6.5 and we believe this interpretation is less confusing and more appropriate for CT technologies.

The proposed revisions to the 4MP APS has discussed with ADWR over the last few months (which were also reviewed by Salt River Project and Tucson Electric Power personnel), include language to clarify that the section in the 4MP titled "Large Scale Power Plants" does not regulate CTs and the requirement for CTs fall under the section in the 4MP titled "Large Scale Cooling Towers." APS's understanding is that ADWR has informally accepted this proposed language for the 4MP, however, we are concerned about the duration of the TMP and how CTs

will be regulated until the 4MP becomes effective. Due to the expected delay in implementing the 4MP over the next few years, APS is interested in learning how ADWR will address this issue for the remainder of the TMP.

In order to address this issue and to avoid any confusion with regulatory compliance with the TMP, APS respectfully requests that ADWR provide written concurrence regarding APS's conclusion that CTs are not currently regulated under Chapter 6.5 of the TMP and are regulated under Chapter 6.6 for the duration of the TMP. The proposed language APS has provided to ADWR will address this issue and clarify any confusion once the 4MP is finalized and becomes effective.

Thank you for allowing APS the opportunity to address, what we feel, is an important change to the Management Plans. Addressing this issue is an important step for the Active Management Areas to achieve their water management goals by implementing conservation requirements with a reasonable set of regulatory criteria which the power generating community can work with. Please let me know if you have any questions or comments.

Sincerely,

Bob Lotts
Manager
APS Water Resource Planning

cc: Sandra Fabritz-Whitney, Director, ADWR
Mike Lacey, Deputy Director, ADWR
Scott Miller, Water Resource Analyst, APS

JANICE K. BREWER
Governor

SANDY FABRITZ-WHITNEY
Director

ARIZONA DEPARTMENT *of* WATER RESOURCES
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012-2105
602.771.8500
azwater.gov

January 21, 2014

Mr. Bob Lotts, Manager
APS Water Resource Planning
PO Box 53999, Mail Station 9424
Phoenix, AZ 85072-3999

RE: Third and Fourth Management Plans

Dear Mr. Lotts:

Thank you for your letter of January 17, 2014 providing an explanation of the operational differences between steam electric power plants and combustion turbine (CT) units, along with the differences in cooling needs and correlated water use. The Third Management Plan (TMP) conservation requirements for large-scale power plants were written specifically for steam electric power plants. However, CT units have different cooling requirements than steam electric power plants because there is no steam to be condensed. The Department agrees with APS's assertion that CT units, because of the differences in cooling requirements, would not fall under the definition of large scale power plants, and would therefore not be regulated under the TMP.

We have reviewed the draft language that you suggested for inclusion in the Fourth Management Plans (4MPs) regarding the differences between steam electric power plants and CT units; this language will be incorporated into the plans, which will provide specific conservation requirements for steam electric power plants and for CT units.

Please let me know if you have any questions about this matter.

Sincerely,

Jeff Tannler
Statewide AMA Director

cc: Tom Buschatzke
Mike Lacey

URS

February 24, 2014

Ms. Ginger Ritter
Arizona Game and Fish Department
WMHB – Project Evaluation Program
5000 West Carefree Highway
Phoenix, AZ 85086-5000

Re: **Project Evaluation Request for the APS Ocotillo Generation Project**

Dear Ms. Ritter:

Arizona Public Service Company (APS) has retained URS Corporation to produce and file with the Arizona Corporation Commission an Application for a Certificate of Environmental Compatibility (CEC) for the Ocotillo Generation Project located in Tempe, Arizona. Enclosed for your review is a map of the project area and a completed Project Evaluation Request describing the elements of the project and surrounding environment. It is anticipated that the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) hearing on the CEC will take place later this year.

URS, on behalf of APS, appreciates the Department's review of this project and any data, advice, or assistance that it provides. We respectfully request a written copy of your evaluation and response. Your reply can be directed to the care of Jennifer Frownfelter at the address listed below and on the attached request form.

If needed, I can be contacted by phone at (303) 740-2651 or by e-mail at robert.debaca@urs.com. I thank you in advance for your review of this submittal and the attached supporting documents.

Cordially,

Robert DeBaca, Ph.D.
Senior Biologist

URS CORPORATION
7720 NORTH 16TH STREET, SUITE 100
PHOENIX, AZ 85020

Enclosures: Completed Project Evaluation Request
Map of the project area and surroundings

cc: Brent Gifford

URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020
Tel: 602.371.1100
Fax: 602.371.1615

Project Evaluation Request
Arizona Game and Fish Department

Notice: In order to obtain a review of your project, we require all of the information requested on this form to be provided. This review is free of charge. However, due to staff and budgetary constraints, we ask you to submit this form early in the process, as estimated turnaround time is 30 days (if you need this review in less than 30 days, please include a needed by date and we will try to accommodate your request). This request is a preliminary review and further project review should include draft documents and a letter formally requesting further environmental review.

Project Evaluation Objectives: *Habitat Evaluation* incorporates fish and wildlife resource needs or features in land and water development projects and land and water management planning efforts in Arizona. *Habitat Protection* ensures habitat protection through environmental compliance and regulation, and to monitor the implementation and effectiveness of mitigation commitments for various land and water development projects and management planning activities in Arizona.

Instructions: The following materials are required to process the request: • **Completed form** • **Map(s) delineating the project area (preferably a USGS quadrangle map)** • **Relevant attachments (other supportive documents, photographs, etc.)**	Send to: **Arizona Game and Fish Department** **Project Evaluation Program, WMHB** **5000 W. Carefree Highway** **Phoenix, Arizona 85086** **Fax 6232367366**

Applicant Requesting Project Evaluation	Date of Request: February 24, 2014		
Name Robert DeBaca, Senior Biologist c/o Jennifer Frownfelter	Organization URS Corporation		
Street Address 7720 N. 16th Street Suite 100	City Phoenix	State AZ	Zip Code 85020
E-Mail Address robert.debaca@urs.com	Telephone Number 303.740.2651	Fax Number 303.694.3946	

Individual/Organization/Agency Proposing Project (if different from above)			
Name Brent Gifford	Organization Arizona Public Service Company (APS)		
Street Address 400 N. 5th Street	City Phoenix	State AZ	Zip Code 85004
E -Mail Address brent.gifford@aps.com	Telephone Number (602) 250-3579	Fax Number	

Location of Proposed Project *Remember to attach a topographic and/or plat map delineating the project area*

County(ies) Maricopa, County		
Township(s) 1 North	Range(s) 4 East	Section(s) SE ¼ section 14

Proposed Project Information

Project Number or Site Name:

Ocotillo Generation Project

What is the proposed date you intend to begin work on the project?

Construction, if approved, would begin in 2016 and be completed in 2018. Decommissioning of the existing steam turbine units would occur in 2018.

Proposed Project Information (continued)

Please briefly describe the project and project activities.

APS plans to install five 102-MW natural-gas fired combustion turbines at the Ocotillo Power Plant in Tempe, and decommission the existing two aging steam turbines on the Ocotillo site. This adds 510 MW and eliminates the existing 220 MW, for a net gain of 290 MW. In addition, the project will use the site's existing transmission lines, switchyard, and gas pipeline, which eliminates the need for costly upgrades that would be required at other locations. Three oil storage tanks would be removed as part of this project from the western side of the current Ocotillo facility. The new turbines will be installed where these oil storage tanks now stand.

Water use per energy generated will be significantly reduced. The plant will use a hybrid cooling system that minimizes water use without sacrificing efficiency and increasing costs.

Air emissions per unit of energy generated would be no more than what is currently found at the plant.

Noise levels would be no more than what is currently found at the plant. The current plant has two large boilers and four 178-foot high stacks. The updated plant will have no boilers and five stacks which are estimated at 85-feet tall.

Briefly describe current land uses and habitat types in the project area.

The project area is fully industrialized. There is a small industrial discharge pond within the Ocotillo site that has scattered native shrubs surrounding it that could provide some habitat to highly adaptable native wildlife. There also appears to be some wetland vegetation (possibly cattails (*Typha* spp.) partially around the margins of the pond. With redevelopment of the project, this pond may dry-up in the future. The local region surrounding the project area is predominantly urban and industrial with limited natural areas. Natural land cover occurs at Papago Park, Hayden Butte Preserve, and along parts of the Salt River. The native plant communities are predominantly upper Sonoran desert scrub and lower Sonoran desert scrub.

List any water bodies such as rivers, intermittent streams, lakes, or wetlands within or near the project area. Xeric washes should also be described, along with any anticipated impacts as a result of the project.

Water bodies associated with the project include the aforementioned industrial pond within the Ocotillo site. Artificial urban lakes occur at Karsten Golf Course, Rio Salado Golf Course, and Rolling Hills Golf Course. The Salt River occurs immediately north of the project area, and runs approximately east to west. It is impounded near the project area, forming Tempe Town Lake. The Salt River is an ephemeral streambed above and below Tempe Town Lake. The the confluence of Indian Bend Wash and Tempe Town Lake/the Salt River occurs on the far bank north of the project area. Indian Bend Wash is an urbanized channel that retains little of its native characteristics.

List any reports that have been prepared to describe the habitat that will be affected by the proposed project (e.g. habitat reconnaissance surveys, wetland delineation, etc.)

Project impacts to biological resources in the project area and its surrounding local region (i.e. a three-mile radius around the existing power plant) are being analyzed in Exhibit C and Exhibit D of the Certificate of Environmental Compatibility (CEC) report.

List any other resources or reviews that relate to the proposed project (correspondence, other phases of the project, other alternatives, etc.)

APS also is concurrently corresponding with the U.S. Fish and Wildlife Service, although there are no anticipated impacts to federally listed species.

List any permits, licenses, or regulatory approvals you have or plan on applying for, or have already received as part of this project.

Application for a Certificate of Environmental Compatibility (CEC) will be prepared for the Arizona Corporation Commission; APS plans to file the application for the CEC in 2014. Additional permits for construction will be obtained to meet further local and state regulations.

Return as hard copy to:	**Return as soft copy:**
AZ Game & Fish Dept. **Project Evaluation Program Habitat Branch** **5000 W. Carefree Hwy.** **Phoenix, AZ 85086**	**via email to pep@azgfd.gov** **or fax to 6232367366** **or upload a file at http://www.azgfd.gov/hgis**

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

April 3, 2014

Ms. Jennifer Frownfelter
URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020

Re: Review of the APS Ocotillo Generation Project.

Dear Ms. Frownfelter:

The Arizona Game and Fish Department (Department) has received your letter, dated February 24, 2014 regarding the installation of the natural-gas fired combustion turbines in Tempe, AZ. We have reviewed the information packet provided to us in your letter. As the proposed project is located in a previously disturbed area, with the present habitat providing relatively low value to wildlife, the Department does not anticipate any significant adverse impacts to wildlife resources would occur as a result of this project.

Thank you for the opportunity to review this project. The receipt you received from the On-Line Environmental Review Tool should provide general recommendations and additional contact information. If you have any questions regarding this letter, please contact me at (623) 236-7615.

Sincerely,

Cheri A. Bouchér
Project Evaluation Program Specialist, Habitat Branch
Arizona Game and Fish Department

cc: Laura Canaca, Project Evaluation Program Supervisor
Kelly Wolff-Krauter, Habitat Program Manager, Region VI

AGFD# M14-03044613

060386

ARIZONA GAME & FISH DEPARTMENT
5000 W CAREFREE HWY
PHOENIX AZ 85086-5000

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APR 07 2014
By

Ms. Jennifer Frownfelter
URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020

BCRTE3B 85020

URS

February 24, 2014

Mr. Steve Spangle
Field Supervisor
U.S. Fish and Wildlife Service
Arizona Ecological Services
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021

Re: **Endangered Species Act Review for the APS Ocotillo Generation Project**

Dear Mr. Spangle:

Arizona Public Service Company (APS) has retained URS Corporation to produce and file with the Arizona Corporation Commission an Application for a Certificate of Environmental Compatibility (CEC) for the Ocotillo Generation Project located in Tempe, Arizona (SE ¼ section 14, T1N, R4E). The elements of the project and the surrounding environment are described further in this letter. It is anticipated that the Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) hearing on the CEC will take place later this year.

APS plans to install five 102-megawatt (MW) natural-gas fired combustion turbines at the Ocotillo Power Plant in Tempe, and decommission the existing two aging steam turbines currently at the power plant. This adds 510 MW and eliminates the existing 220 MW, for a net gain of 290 MW. In addition, the project would use the site's existing transmission lines, switchyard, and gas pipeline, which eliminates the need for costly upgrades that would be required if the capacity were developed at a different location. Obsolete fuel tanks (two) and oil storage tanks (three) located on the southern and western portions of the Ocotillo site would be removed as part of this project.

The project area is fully industrialized. There is a small industrial discharge pond within the Ocotillo Generation Plant that has scattered native shrubs surrounding it that could provide some habitat to highly adaptable native wildlife. There also appears to be some wetland vegetation (possibly cattails (*Typha* spp.) partially around the margins of the pond. With redevelopment of the project, this pond may dry-up in the future. The local region surrounding the project area is predominantly urban and industrial with limited natural areas. Natural land cover occurs at Papago Park, Hayden Butte Preserve, and along parts of the Salt River. The native plant communities in the aforementioned natural areas are predominantly upper Sonoran desert scrub and lower Sonoran desert scrub.

Water bodies associated with the project include the aforesaid industrial pond within the Ocotillo site. Additionally, artificial urban lakes occur at Karsten Golf Course, Rio Salado Golf Course, and Rolling Hills Golf Course. The Salt River is about one-half mile north of the project area, and runs approximately east to west. It is impounded near the project area, forming Tempe Town Lake. The Salt River is an ephemeral or intermittent streambed above and below Tempe Town Lake. The confluence of Indian Bend Wash and Tempe Town Lake occurs on the far bank north of the project area. Indian Bend Wash is an urbanized channel that retains little of its native characteristics.

URS Corporation
7720 North 16th Street, Suite 100
Phoenix, AZ 85020
Tel: 602.371.1100
Fax: 602.371.1615

URS biologists carefully reviewed the U.S. Fish and Wildlife Ecological Services website on 15 December 2013, for federally listed, proposed, and candidate species as well as proposed and designated critical habitat that could be present in Maricopa County. According to the species list for Maricopa County, dated 30 October 2013, there are 12 species that are listed, one species that is proposed as threatened, and another four that are categorized as candidate species. These include the following species:

- acuña cactus (*Echinomastus erectrocentrus* var. *acunensis*) – endangered
- Arizona cliffrose (*Purshia subintegra*) – endangered
- California least tern (*Sterna antillarum browni*) – endangered
- desert pupfish (*Cyprinodon macularius*) – endangered
- Gila topminnow (*Poeciliopsis occidentalis occidentalis*) – endangered
- lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) – endangered
- Mexican spotted-owl (*Strix occidentalis lucida*) – threatened
- razorback sucker (*Xyrauchen texanus*) – endangered
- Sonoran pronghorn (*Antilocapra americana sonoriensis*) – endangered
- southwestern willow flycatcher (*Empidonax traillii extimus*) – endangered
- woundfin (*Plagopterus argentissimus*) – endangered
- yellow-billed cuckoo (*Coccyzus americanus*) – proposed threatened
- Yuma clapper rail (*Rallus longirostris yumanensis*) – endangered
- roundtail chub (*Gila robusta*) – candidate
- Sonoran desert tortoise (*Gopherus morafkai*) – candidate
- Sprague's pipit (*Anthus spragueii*) – candidate
- Tucson shovel-nosed snake (*Chionactis occiptalis klauberi*) – candidate

In December 2013, URS biologists evaluated potential impacts to the aforementioned list of species during preparation of Exhibit C of the CEC. URS concluded that the action area was either outside the geographic or elevational range or lacked suitable habitat for these species. There was no designated critical habitat in the action area. For these reasons, URS concluded that the Ocotillo Generation Project would have "no effect" on listed, proposed, or candidate species or proposed or designated critical habitat.

URS also reviewed local bird survey results and observed that both the bald eagle (*Haliaeetus leucocephalus*) and the American peregrine falcon (*Falco peregrinus anatum*) utilize habitats at Tempe Town Lake during the non-breeding season. The closest potential perch sites are approximately 1,200 meters northeast of proposed construction and demolition locations at the Ocotillo Generation Plant. No impact to these two species is anticipated from construction or operation of the Project.

URS respectfully requests the Service's verification of these impact findings and appreciates any further comments the Service may have. Your written response and comments can be directed to me in care of Jennifer Frownfelter at the address below. Meanwhile, if you have any questions or require additional information, please contact me by phone at 303-740-2651 or by e-mail (robert.debaca@urs.com) at your earliest convenience.

Cordially,

Robert DeBaca, Ph.D.
Senior Biologist

URS CORPORATION
7720 NORTH 16TH STREET, SUITE 100
PHOENIX, AZ 85020

Enclosures: Map of the project area and surroundings

cc: Brent Gifford

United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In reply refer to:
AESO/SE
02EAAZ00-2014-TA-0155
02EAAZ00-2014-CPA-0022

April 8, 2014

Robert DeBaca, Ph.D.
U.R.S. Corporation
7720 North 16th Street, Suite 100
Phoenix, Arizona 85020

Dear Dr. DeBaca:

Thank you for your correspondence of February 24, 2014, received in our office March 4. This letter documents our recommendations regarding the Arizona Public Service (APS) Ocotillo Generation Project (Project), in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703 *et seq.*), and the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668 *et seq.*). Based on the information that you have provided, we believe that no endangered or threatened species or critical habitat will be affected by this project; nor is this project likely to jeopardize the continued existence of any proposed species or adversely modify any proposed critical habitat. No further ESA review is required for this project at this time. Should project plans change or if additional information on the distribution of listed or proposed species becomes available, this determination may need to be reconsidered.

To clarify information in your February 24, 2014 letter, the Salt River above the eastern dam at Tempe Town Lake supports aquatic and riparian habitat, including fish habitat and foraging habitat for bald eagles (*Haliaeetus leucocephalus*) nesting in the area and waterfowl habitat and potential foraging habitat for American peregrine falcon (*Falco peregrinus anatum*). We note that the proposed Project is in an area of high human activity and that the existing facilities to be removed are at least 0.5 mile from the Salt River channel, minimizing potential disturbance effects to bald eagle or peregrine falcons. We recommend that the project proponent be aware of compliance with the BGEPA and MBTA when planning and implementing the Project. There is a possibility that bald eagles could occur in the Project area. As a result, we recommend that the design and construction of the Project minimize the potential for attracting either perching or nesting bald eagles. Our point of contact for technical assistance on this subject, if desired, is Greg Beatty at 602-242-0210.

In keeping with our trust responsibility to American Indian Tribes, and pursuant to Secretarial Order 3206, we encourage you to invite any Tribe affected by the proposed action and the Bureau of Indian Affairs (BIA) to participate in review of the proposed action and, by copy of

this letter, are notifying potentially affected tribes and the BIA. We encourage you to coordinate review of this project with the Arizona Game and Fish Department.

Should you require further assistance or if you have any questions, please contact Bill Werner (x217) or Brenda Smith (928-556-2157). Thank you for your continued efforts to conserve endangered species.

Sincerely,

Brenda H Smith

for Steven L. Spangle
Field Supervisor

cc: (electronic copy)
Director, Hopi Cultural Preservation Office, Kykotsmovi, AZ
Assistant Attorney General, Pascua Yaqui Tribe, Tucson, AZ
Director, Cultural Resources Department, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ
Director, San Carlos Tribal Historic Preservation Office, San Carlos, AZ
Director, Cultural Resources, White Mountain Apache Tribe, Whiteriver, AZ
Tribal Archaeologist, Yavapai-Apache Nation, Camp Verde, AZ
Director, Cultural Research Program, Yavapai-Prescott Indian Tribe, Prescott, AZ
Branch Chief, Environmental Quality Services, Western Regional Office, Bureau of Indian Affairs, Phoenix, AZ
Fish and Wildlife Biologists, Fish and Wildlife Service, Phoenix, AZ (Greg Beatty, Lesley Fitzpatrick)
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Region VI, Arizona Game and Fish Department, Mesa, AZ

W:\William Werner\L DeBaca APS Ocotillo Generation Project 02EAAZ))_2014_TA_0155 040714

Recd 6/18/14

SHPO-2013-1074 (119871)

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

RECEIVED
MAY 22 2014
ARIZONA STATE HISTORIC PRESERVATION OFFICE

State Historic Preservation Office
Arizona State Parks
1300 W. Washington Street
Phoenix AZ 85007

Dear ~~Dr. Jacobs:~~ David

As you are aware, Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS is submitting the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with your office, determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with your office to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with our archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in *"Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona"* (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with your office and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the Tempe City Historic Preservation Office, the Salt River Pima-Maricopa Indian Community, the Gila River Indian Community, the Ak-Chin Indian Community, the Tohono O'odham Nation, the Hopi Tribe, the Ft. McDowell Yavapai Nation, the Yavapai Apache Nation, the Yavapai-Prescott Indian Tribe, and the Pascua Yaqui Tribe, and will keep your office informed of the results of those consultations, and any concerns or comments they may have regarding this project.

APS very much appreciates the opportunity to work with your office and is grateful for the discussions and advice offered prior to this even being an actual project. We ask that you please review the contents of this letter as well as the four enclosures and the

recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date, as well as the recommendations in this letter and the enclosed documents including the eligibility recommendation for the original plant facility. We solicit any comments and feedback you may have, and shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

CONCUR

4 JUN 14

Arizona State Historic Preservation Office

Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

"*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013)

Arizona Historic Property Inventory Form Inventory # OPP-1

"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

aps

P.O. Box 53933
Phoenix, AZ 85072

July 14, 2014

Mr. Joseph Nucci
Tempe Historic Preservation Officer
P.O. Box 5002
Tempe AZ 85280

Joe

Dear ~~Mr. Nucci~~:

As you are aware, Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is continuing to consult with the City of Tempe Historic Preservation Office (HPO) because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03, which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) that is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS acknowledges receipt of, and very much appreciates, your recent feedback and comments regarding the Ocotillo Power Plant facility both via phone call and your email of June 26, 2014. APS understands that the Tempe HPO concurs with the adequacy of the cultural resource work carried out to date, and the conclusions and recommendations laid out in the URS Cultural Resource Report 2014-4(AZ) with regard to prehistoric cultural resources at the site. APS also understands that Tempe HPO takes exception with URS's finding that the power plant facility itself is not historically significant.

APS understands and acknowledges that the Tempe HPO believes the power plant facility to be "a landmark symbolic of the ne plus ultra period of community development in Tempe, and one demonstrative of events that have made a significant

contribution to the broad patterns of Arizona history." Furthermore, the Tempe HPO believes that this mid-century interval represents the period of development "that arguably most profoundly shaped the feel and fabric of the built environment in Tempe, and it is a period that to date remains relatively undocumented."

Additionally, the Tempe HPO states that "APS has yet to address and document the significance of its role in facilitating the mid-century period of development in the Valley," and that "without this recognition and documentation, demolition of this iconographic facility would have an adverse effect on Tempe's ability to interpret this most significant period of Tempe's history."

To address this concern, your office has requested that APS consider mitigating this effect by developing a context related to "Infrastructure for Community Development in Tempe, 1958 to 1975." Tempe HPO believes that this would provide a lasting value to the East Valley preservation community as it begins in earnest to evaluate this most formative period of your community's history.

APS has carefully reviewed and considered Tempe HPO's comments. You clearly indicated in a recent phone call that Tempe HPO's goal here is **not** to preserve the power plant, but simply to ensure that an effort is made to adequately document the plant's role in Tempe history, set within in this mid-century context (~1958 to 1975). You indicated that the development of such a document would adequately mitigate any potential adverse effect of the demolition of plant facilities.

APS has long been a supporter of historic preservation in Arizona, and believes this to be a fair and reasonable request. As such, APS proposes to offer the City of Tempe HPO a grant in the amount of $15,000 for the specific purpose of hiring a qualified historian to develop and write a short history of the Ocotillo Power Plant set within the context of "Infrastructure for Community Development in Tempe, 1958 to 1975." APS believes the City of Tempe HPO is better situated to directly manage such a project and that a grant to Tempe HPO would ensure that the project meets Tempe HPO's needs and requirements.

APS is concurrently consulting with the Arizona State Historic Preservation Office (SHPO) and potentially interested tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

As always, APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter and the recommendations contained therein. If the Tempe HPO finds that the proposed grant would adequately mitigate all of Tempe HPO's concerns and issues regarding the project, APS requests that you please sign, date, and return a copy of this letter to my office at your soonest convenience.

We continue to solicit any other comments and feedback you may have regarding this project, and shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

By Joseph G Nucci Joseph Nucci 2014.07.14 15:24:41 -07'00'

SIGNATURE FOR TEMPE HPO CONCURRENCE DATE

PRINTED NAME and TITLE

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Joseph Nucci
Tempe Historic Preservation Officer
P.O. Box 5002
Tempe AZ 85280

Joe

Dear ~~Mr. Nucci~~:

As you may be aware, Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with the SHPO to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with the archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO and potentially interested tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents, including the eligibility recommendation for the original plant

facility. We solicit any comments and feedback you may have, and shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
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Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

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Arizona Historic Property Inventory Form Inventory # OPP-1

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aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Louis J. Manuel, Jr., Chairman
Ak-Chin Indian Community
42507 W. Peters & Nall Rd.
Maricopa AZ 85138-3940

Dear Chairman Manuel:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with the SHPO to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with the archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS <u>does</u> agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
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P.O. Box 53933, M.S. 3372 s
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Cc: Caroline Antone, Cultural Resources Manager

Enclosures:

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aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Ruben Balderas, President
Ft. McDowell Yavapai Nation
P.O. Box 17779
Fountain Hills AZ 85269

Dear President Balderas:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

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APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

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would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

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URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

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APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Karen Ray, Cultural Coordinator

Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

"*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013)

Arizona Historic Property Inventory Form Inventory # OPP-1

"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Gregory Mendoza, Governor
Gila River Indian Community
P.O. Box 97
Sacaton AZ 85147

Dear Governor Mendoza:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with the SHPO to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with the archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

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Jon M. Shumaker, Archaeologist

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Cc: Barnaby V. Lewis, Tribal Historic Preservation Officer

Enclosures:

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GILA RIVER INDIAN COMMUNITY

POST OFFICE BOX 2140, SACATON, AZ 85147

TRIBAL HISTORIC PRESERVATION OFFICE

(520) 562-7162
Fax: (520) 562-5083

June 5, 2014

Jon M. Shumaker, Archaeologist
Natural Resources Department
Arizona Public Service Company
P.O. Box 53033, Mail Station 3372
Phoenix, Arizona 85072-3933

RE: Demolition and Removal of the Ocotillo Power Plant, 1500 E. University Boulevard, Tempe, Arizona

Dear Mr. Shumaker,

The Gila River Indian Community Tribal Historic Preservation Office (GRIC-THPO) has received your consultations documents dated May 20, 2014. The Arizona Public Service Company (APS) proposes to demolish the Ocotillo Power Plant located at 1500 E. University Boulevard, Tempe, Arizona and to construct in the same location, five new natural gas-powered generating units and associated facilities. The power plant covers an area 126 acres is size. The western part of the plant area, 15.8 acres in size, will be directly affected by the undertaking. There are three large fuel storage tanks which will be demolished and removed. An additional 10.4 acres of the area will be used for temporary construction offices, material laydown area, and parking. The Ocotillo Power Plant is located on private land and funding for this undertaking is also from a private source. The majority of the 126 acre plant area has been heavily disturbed and obscured by pavement, gravel and existing facilities. Due to the heavy disturbance of the surface area, APS determined that an archaeological survey of the Ocotillo Power Plant area for would be ineffectual. The APS recommended that archaeological consultants from URS conduct archaeological monitoring of borehole placement during geotechnical explorations conducted in September 2013. Prehistoric artifacts were identified and recovered during the monitoring, but presence or absence of significant buried resources remained undetermined.

As a result of archaeological monitoring, URS conducted phased testing of the project area in November 2013. Backhoe trenching, although restricted due to buried power plant infrastructure, revealed the presence of a prehistoric canal and prehistoric artifacts. The site was designated AZ U:9:3:11(ASM) and considered eligible to the Arizona Register of Historic Places. The extent of the site and establishment of a site boundary have not been defined. Additional archaeological excavation is required to definitively identify a site boundary. The URS has recommended, and the APS has agreed, that additional archaeological data recovery efforts be conducted.

The URS has also completed a State of Arizona Historic Property Inventory Form for the Ocotillo Power Plant. The power plant was initially under construction from 1958 to 1960. The Ocotillo Power Plant is not considered eligible for listing on the Arizona Register of Historic Places. The APS is seeking concurrence with the adequacy of the cultural resource investigations, the cultural

resources reports, the cultural resource management recommendations, and determinations of site register eligibility. The APS has not made a finding of effect for this undertaking.

The GRIC-THPO concurs with the adequacy of the archaeological work conducted at the Ocotillo Power Plant. We appreciate that the APS is consulting with Tribes for this undertaking occurring on private lands. The GRIC concurs that the Ocotillo Power Plant is not a Arizona Register of Historic Places property, and agrees that additional archaeological data recovery work is necessary prior to ground disturbing activities at the plant. The archaeological monitoring report and the archaeological testing report are adequate, acceptable cultural resource management documents. We trust that the APS will notify our office in the event that there is the discovery of human remains. The proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation). The GRIC-THPO defers to the Salt River Pima-Maricopa Indian Community as lead in the consultation process.

Thank you for consulting with the GRIC-THPO on this project. If you have any questions please do not hesitate to contact me or the Archaeological Compliance Specialist Larry Benallie, Jr. at 520-562-7162.

Respectfully,

Barnaby V. Lewis
Tribal Historic Preservation Officer
Gila River Indian Community

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Herman G. Honanie, Chairman
Hopi Tribe
P.O. Box 123
Kykotsmovi AZ 86039

Dear Chairman Honanie:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

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The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicates there is little possibility for the discovery of human remains within the construction footprint.

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That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
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Cc: Leigh Kuwanwisiwma, Director, Hopi Cultural Preservation Office

Enclosures:

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THE HOPI TRIBE

Herman G. Honanie
CHAIRMAN

Alfred Lomahquahu Jr.
VICE-CHAIRMAN

May 28, 2014

Jon M. Shumaker, Archaeologist
Arizona Public Service Company, Natural Resources Department
P.O. Box 53933, M.S. 3372 s
Phoenix, Arizona 85072-3933

Re: Ocotillo Power Plant, Tempe

Dear Mr. Shumaker,

This letter is in response to your correspondence dated May 20, 2014, with enclosed cultural resource records review and testing reports regarding Arizona Public Service Company planning the demolition and removal of portions of the exiting Ocotillo Power Plant in Tempe and construction of five new natural gas generating units. The Hopi Tribe claims cultural affiliation to earlier identifiable cultural groups in Arizona, including the Hohokam cultural group in southern Arizona. The Hopi Cultural Preservation Office supports the identification and avoidance of our ancestral sites, and we consider the prehistoric archaeological sites of our ancestors to be Traditional Cultural Properties. Therefore, we appreciate UDOT's continuing solicitation of our input and your efforts to address our concerns.

The Hopi Cultural Preservation Office requests consultation on any proposal with the potential to adversely affect prehistoric cultural resources in Arizona. We have reviewed the enclosed reports and undertand a buried canal and scatter of disturbed artifacts, site AZ U:9:3:11 (ASM), was identified and additional testing is recommended. Please provide us with a copy of any additional testing report and any proposed treatment plans for review and comment

If you have any questions or need additional information, please contact Terry Morgart at the Hopi Cultural Preservation Office at 928-734-3619 or tmorgart@hopi.nsn.us. Thank you for your consideration.

Respectfully,

Leigh J. Kuwanwisiwma, Director
Hopi Cultural Preservation Office

xc: Arizona State Historic Preservation Office

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Diane Enos, President
Salt River Pima-Maricopa Indian Community
10005 East Osborn Rd.
Scottsdale AZ 85256

Dear President Enos:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

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APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the five enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Angela Garcia-Lewis, Cultural Preservation Compliance Supervisor

Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

"*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013)

Arizona Historic Property Inventory Form Inventory # OPP-1

"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

Salt River
PIMA-MARICOPA INDIAN COMMUNITY
10005 EAST OSBORN ROAD/SCOTTSDALE, ARIZONA 85256/ PHONE (480) 362-6337

Cultural Preservation Program

July 11, 2014

Jon M. Shumaker, Archaeologist
Arizona Public Service Company, Natural Resources Department
P.O. Box 53033, Mail Station 3372
Phoenix, Arizona 85072-3933

RE: Demolition & Removal of the Ocotillo Power Plant in Tempe, Arizona

Dear Mr. Shumaker,
The Salt River Pima-Maricopa Indian Community is a federally recognized tribe located near Scottsdale, Arizona. The SRP-MIC is in receipt of a request to consult on the proposed Arizona Public Service Company (APS) project to demolish the existing 126 acre Ocotillo Power Plant (1500 E. University Boulevard, Tempe, Arizona) and construction of five new natural gas-powered generating units and associated facilities in the same location, directly impacting 15.8 acres of the west portion of the site. This privately funded project is located on private land jurisdiction within the federally adjudicated aboriginal lands of the Four Southern Tribes of Arizona (the SRP-MIC, the Gila River Indian Community, the Ak-Chin Indian Community, and the Tohono O'Odham Nation). As such the SRP-MIC will take the lead on handling further consultation on this project on behalf of the other Four Southern Tribes of Arizona.

At present there are three fuel storage tanks to be demolished and removed. An additional I 0.4 acres of the area will be used for temporary construction offices, material laydown area, and parking. URS Corporation conducted archaeological monitoring of borehole placement during geotechnical explorations (in September 2013) where prehistoric archaeological materials were encountered but was unable to determine the presence or absence of significant buried resources. Based on those results, URS Corporation conducted phased testing of the project area in November 2013 that yielded an Arizona Register eligible prehistoric canal site AZ U:9:3: 11([ASM)]), although URS recommended further investigation to determine extent and to establish site boundaries.

Although APS has not made a finding of effect for this project, the SRPMIC concurs with the URS Corporation and APS recommendations that the cultural resource investigations were adequate and additional archaeological data recovery is necessary. The SRP-MIC review indicates that archaeological monitoring report and the archaeological testing report are adequate and acceptable cultural resource management documents. The SRP-MIC will take the lead in any cultural resource discovery consultation. As such please notify the SRPMIC Cultural Preservation Program at 480-362-3625 when work commences. The SRP-MIC will be the lead tribe in reference to all applicable cultural resource laws. Please include Shane Anton, CPP Manager (480-362-6331/ Shane.Anton@srpmic-nsn.gov) Angela D. Garcia-Lewis, Cultural Compliance Supervisor (480-362-6337 Angela.Garcia-Lewis@srpmic-nsn.gov) and Matthew Garza, NAGPRA Coordinator (480-362-6627/ Matthew.Garza@srpmic-nsn.gov) in future communications regarding this project. The SRP-MIC CPP prefers both phone and email notification. Feel free to call me or email for additional clarification in regard to this or any cultural resource issue. Thank you for your time and effort in this matter.

Sincerely,

Angela D. Garcia-Lewis,
SRP-MIC Cultural Preservation Compliance Supervisor

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Ernest Jones, Sr., President
Yavapai-Prescott Indian Tribe
530 E. Merritt St.
Prescott AZ 86301

Dear President Jones:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with the SHPO to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with the archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the five enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Gregory Glassco, Cultural Research Department

Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

"*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013)

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"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

YAVAPAI

PRESCOTT ◆ INDIAN ◆ TRIBE

June 16, 2014

Mr. Jon M. Shumaker
Archaeologist, Natural Resources Department
Arizona Public Services
P.O. Box 53933 M.S. 3372 s
Phoenix, AZ 85072-3933

Dear Mr. Shumaker:

Thank you for your letter dated May 20, 2014 and the two reports, entitled *Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona* (URS Cultural Report 2013-27 AZ) and *Archaeological Testing at the APS Ocotillo Power Plant, Tempe, Arizona, Maricopa County, Arizona* (URS Cultural Resources Report 2014-4 AZ). Aboriginal Yavapai territory extended close to the Ocotillo Power Plant in Tempe, and we therefore appreciate you consulting with us and soliciting our opinions and concerns.

The cultural resource records review report and the archaeological testing reports prepared by URS Corporation look adequate to us. We appreciate the diligence of APS and URS to conduct archaeological testing in a precarious and potentially dangerous environment containing subsurface infrastructure from the existing Ocotillo Power Plant. We concur with the adequacy of the cultural resource work done to date.

The Yavapai-Prescott Indian Tribe supports the proposal to conduct further archaeological testing in areas that were off-limits due to safety issues, as well as testing at depths greater than five feet in areas where that would be deemed appropriate.

Please keep us informed on this project.

Sincerely,

Linda Ogo
Director,
Cultural Research Department

LO:gtg06162014

530 E. MERRITT PRESCOTT, AZ 86301-2038 Phone 928-445-8790 FAX 928-778-9445

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Peter Yucupicio, Chairman
Pascua Yaqui Tribe of Arizona
7474 S. Camino de Oeste
Tucson AZ 85746

Dear Chairman Yucupicio:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

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The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

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APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power plant project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Rolando Flores, Assistant Tribal Attorney General

Enclosures:

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aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Ned Norris, Jr., Chairman
Tohono O'odham Nation
P.O. Box 837
Sells AZ 85634

Dear Chairman Norris:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

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APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

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The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

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URS has recommended that the buried canal and the scatter of artifacts in disturbed context be designated as site AZ U:9:3:11 (ASM),and has recommended this site to be eligible to the Arizona Register of Historic Places under Criterion D for its information potential.

URS has also recommended that further archaeological testing be carried out, focusing on areas that might be disturbed during construction, and that deeper testing also be done when it is safe and prudent to do so. They also recommend archaeological monitoring during construction where deemed prudent, unless further testing on the site indicate there is little possibility for the discovery of human remains within the construction footprint.

APS believes that aside from the prehistoric canal feature and associated artifacts, specific definition of the proposed boundary of site AZ U:9:3:11 (ASM) is premature as the artifacts found away from the canal area are generally found on secondarily deposited berms consisting of fill and are therefore not *in situ*. Indeed, URS notes that "the site boundaries are somewhat arbitrary." Further testing in the area to a depth of five feet failed to identify other prehistoric features or significant archaeological deposits.

That said, APS does agree with URS that further testing is necessary because the original testing project was constrained by safety concerns, and there is still some potential for archaeological deposits in areas that were off-limits due to safety issues, as well as at depths greater than five feet. APS intends to continue its identification efforts, and should any significant cultural resources/historic properties be identified during further testing, either the project would be redesigned to avoid impacts to those resources, or, a data recovery project would be designed in consultation with the SHPO and utilizing a professional cultural resource contractor to mitigate any adverse effects to any historic properties that may be encountered. If it cannot be avoided during construction, further work in the area of the canal will also be done to determine the extent of the canal and whether or not there is potential for the existence of a network of prehistoric field ditches.

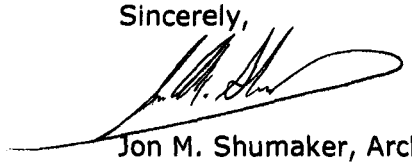
APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the four enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,



Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Peter Steere, Tribal Historic Preservation Officer

Enclosures:

Ocotillo Power Plant Modernization Fact Sheet

"*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013)

Arizona Historic Property Inventory Form Inventory # OPP-1

"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

aps

P.O. Box 53933
Phoenix, AZ 85072

May 20, 2014

Mr. Thomas Beauty, Chairman
Yavapai-Apache Nation
2400 W. Datsi St.
Camp Verde AZ 86322

Dear Chairman Beauty:

Arizona Public Service Company (APS) is in the early planning stages of a proposed project that would consist of a) the demolition and removal of portions of the existing Ocotillo Power Plant and various associated facilities and, b) the construction of five new natural gas-fired generating units and associated facilities at that same location. APS is consulting with your office because siting of the new facility falls under Arizona Revised Statutes (ARS) 40-360.03 which requires APS to file an application for a Certificate of Environmental Compatibility (CEC) which is subject to review by the Arizona Corporation Commission's (ACC's) Arizona Power Plant and Transmission Line Siting Committee (Siting Committee) under ARS 40-360.01 et seq. A short information sheet about the proposed project is included for your review.

Under ARS 40-360-06, "Factors to be considered in issuing a certificate of environmental compatibility," #5 calls out that "Existing scenic areas, historic sites and structures or archaeological sites at or in the vicinity of the proposed site" are factors to be considered by the Siting Committee in determining whether or not to recommend issuance of a CEC.

Pursuant to the ACC Rules of Practice and Procedure R14-3-219 (#6), the application for a CEC shall "Describe any environmental studies applicant has performed or caused to be performed in connection with this application or intends to perform or cause to be performed in such connection, including the contemplated date of completion." Furthermore, under R14-3 "Exhibits to Application," Exhibit E shall "Describe any existing scenic areas, historic sites and structures or archaeological sites in the vicinity of the proposed facilities and state the effects, if any, the proposed facilities will have thereon."

APS submits the following information for your review and comment as part of this process to support the ACC's compliance with the Arizona State Historic Preservation Act (ARS 41-861 et seq.), which requires state agencies to consider the impacts of their programs on historic properties listed on, or eligible for, the Arizona Register of Historic Places.

Ocotillo Power Plant is located on private land, at 1500 E. University Blvd. in Tempe, Arizona. The site is within T1N, R4E, the SE1/4 of S14, G&SRB&M. While the entire APS-owned property consists of approximately 126 acres, it is estimated that only about 15.8 acres would be affected by the new construction, mostly on the western portion of the APS parcel. The majority of this area is currently occupied by three large fuel storage tanks, which would be demolished and removed. Another 10.4 acres

would be used for temporary construction offices, material laydown areas, and parking. The majority of the surface area of the 126 acre APS-owned property is disturbed and/or obscured by gravel, pavement, and existing facilities. Funding for the proposed project is private.

Discussions with APS management regarding a possible re-purposing of this property resulted in my recommendation that APS should perform the maximum level of due diligence should any possible future project require some level of state and/or Federal cultural resource compliance. It was felt that not only was this a prudent course of action, it was also the right thing to do and would be consistent with one of APS's core corporate values, that of environmental stewardship.

Because virtually the entire ground surface at Ocotillo is disturbed and/or obscured, it was determined that a standard archaeological survey would have little value in trying to identify cultural resources. During June-July 2013, APS conducted geotechnical investigations on the property for the purpose of characterizing subsurface sediments. Due to the ground-disturbing nature of geotechnical boring, and also due to a desire to begin to understand the potential for subsurface cultural resources on the property, my office, in informal consultation with the Arizona State Historic Preservation Office (SHPO), determined that it would be appropriate to engage a professional archaeological consulting firm to monitor the boreholes for cultural resources and to take a cursory look at any possible exposures (such as the berms surrounding the existing fuel tanks) for the presence/absence of cultural resources.

APS hired URS Corporation to do the work. The resulting report, "*Cultural Resource Records Review and Archaeological Monitoring of Geotechnical Investigations at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogan and Kirvan 2013) is enclosed for your review and comment. The report confirmed that "the Hohokam intensively occupied the area in the vicinity of the power plant parcel for several centuries." It also noted that the prehistoric village was located on the Mesa terrace adjacent to the Salt River, while the power plant facility is located on the lower Lehi terrace. Previous investigations of the Lehi terrace have thus far identified evidence of prehistoric farming and related field houses on that lower terrace. Additionally, the borehole monitoring project identified a few hundred Hohokam artifacts from a highly disturbed context at the western end of the power plant parcel. The results of the geotechnical monitoring project were indeterminate with regard to the presence/absence of significant cultural resources.

After meeting with the SHPO to discuss the results of the geotechnical monitoring project in September 2013, we both agreed with Dr. Gene Rogge (with the archaeological contractor URS), that further archaeological testing was warranted. URS developed a phased backhoe archaeological testing program for the purpose of determining whether or not there might be preserved subsurface cultural resources in the Ocotillo parcel.

The Ocotillo Power Plant was constructed in 1958-1960, making it of historic age. To address the question of whether or not the power plant itself might be eligible for the Arizona Register of Historic Places, in October 2013, URS was tasked with completing an Arizona Historic Property Inventory Form, a copy of which is enclosed for your review and comment. URS has recommended that the existing Ocotillo facility was not eligible for the Arizona Register due to a lack of significance under any of the criteria A-D.

The next phase of archaeological testing work began in November 2013. The results of this phase of testing are reported in "*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014), a copy of which is enclosed for your review and comment. The project was significantly constrained by safety concerns due to the presence of subsurface infrastructure throughout the area. Nevertheless, some 424 meters (1,390 feet) of backhoe trench were put in to a depth of five feet, with an additional 50' trench excavated to seven feet in depth. A single feature, a prehistoric irrigation canal was identified with associated artifacts, and further examination was made of a scattering of artifacts from disturbed context located along the berms surrounding the existing fuel tanks.

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APS is concurrently consulting with the SHPO, the City of Tempe Historic Preservation Office and potentially interested Native American tribes, and will keep your office informed of who specifically is consulted with, the results of those consultations, and any concerns or comments the other parties may have regarding this project.

APS very much appreciates the opportunity to work with your office. We ask that you please review the contents of this letter as well as the five enclosures and the recommendations contained therein. We request your concurrence with the adequacy of the cultural resource work to date as well as the recommendations in this letter and the enclosed documents. We solicit any comments and feedback you may have, and

shall continue coordinating closely with your office should the new power facility project be approved.

If you have any questions, comments, or issues, please feel free to contact me by email at jon.shumaker@aps.com or at the phone and address listed below. Thanks!

Sincerely,

Jon M. Shumaker, Archaeologist

Archaeological Services
Natural Resources Department
Arizona Public Service Company
P.O. Box 53933, M.S. 3372 s
Phoenix AZ 85072-3933
602-371-5298 Office
602-677-1747 Cell
602-371-5241 Fax

Cc: Christopher Coder, Tribal Archaeologist

Enclosures:

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Arizona Historic Property Inventory Form Inventory # OPP-1

"*Archaeological Testing at the Ocotillo Power Plant, Tempe, Maricopa County, Arizona*" (Rogge, Kirvan, and Phillips 2014)

APPENDIX J-3 – DIRECT MAIL OF PROJECT INFORMATION

Investing in Arizona's Energy Future

Dear Neighbor,

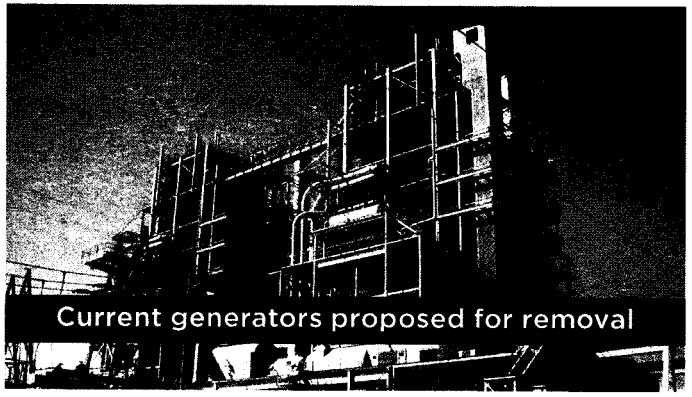
APS is making investments today that allow us to produce energy in cleaner, more efficient ways tomorrow.

One such investment is modernizing the Ocotillo Power Plant, located at University and McClintock in Tempe, Arizona. APS intends to replace two old generators with five modern, more efficient units that will not increase the plant's footprint. They still will be powered by natural gas.

The new units will stand about half as tall as the old ones, reduce emission rates and maintain reliable service for our customers.

We will provide periodic updates and opportunities for public input as project permitting moves forward. We invite you to learn more about the project at azenergyfuture.com/ocotillo. Comments can be submitted through the website or emailed to OcotilloGenProj@aps.com.

To receive future updates by email or to opt out of future mailings, please visit azenergyfuture.com/ocotillo.



Current generators proposed for removal

Proposed project rendering looking west

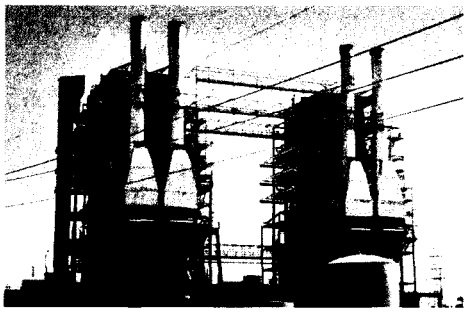
c/o URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, AZ 85020

PRESORTED
FIRST CLASS MAIL
U.S. POSTAGE
PAID
PHOENIX, AZ
PERMIT No. 90

OCOTILLO MODERNIZATION PROJECT

APRIL 2014

Renewing Ocotillo Power Plant for Arizona's Energy Future



Current 1960s-era generators planned for removal

Proposed Ocotillo Project rendering looking west

The Ocotillo Power Plant in Tempe has served Valley customers reliably for more than a half-century. APS plans to invest in the aging plant today so we can produce energy in cleaner, more efficient ways for decades to come.

The proposed plan to modernize Ocotillo, located at University and McClintock, includes replacing two old generators built in 1960 with five modern, more efficient units on the existing plant site. Five large oil storage tanks also would be removed.

The natural gas-fired combustion turbines we plan to install will create numerous visual, environmental and economic benefits. They will:

- stand about half as tall as the old generators
- reduce water-use rates and air emission rates
- improve overall noise conditions at the plant
- provide more than 100 jobs during construction
- increase property-tax revenue from $600,000 to an estimated $8 million for city, county and state agencies by the fifth year of operation

The new units also will be much more responsive to customer demand. They can start up and begin delivering electricity in less than six minutes, while the old generators take up to six hours to start.

We plan to invest up to $700 million in the project, which would nearly double Ocotillo's generating capacity from 330 to 620 megawatts. The increased capacity would enable us to reliably incorporate more sources of clean, renewable energy on the electric grid for customers.

TIMELINE

- Applications for regulatory approval and necessary permits filed beginning in spring 2014
- Construction would begin in 2016 and be completed by summer 2018
- Decommissioning and removal of the old generators would begin in fall 2018

WE WANT TO HEAR FROM YOU

We value input from our customers, neighbors and other interested parties as part of the project. The public is invited to an open house on Tuesday, April 22 from 5–8 p.m. at the ASU Karsten Golf Course Clubhouse to review information about the project, ask questions and contribute comments.

You can learn more about the project, sign up for email updates and provide remarks by visiting the project website at azenergyfuture.com/ocotillo. You can also email comments to OcotilloGenProj@aps.com.

This newsletter is also available in Spanish at **azenergyfuture.com/ocotillo**

CS#1403010

aps

c/o URS Corporation
7720 N. 16th Street, Suite 100
Phoenix, AZ 85020

Presorted
Standard
US Postage Paid
Phoenix, AZ
Permit No. 90

OCOTILLO MODERNIZATION PROJECT

aps

APRIL 2014

Renewing Ocotillo Power Plant for Arizona's Energy Future

Public Information Open House Meeting

5–8 p.m.
Tuesday, April 22, 2014
ASU Karsten Golf Course Clubhouse
1125 East Rio Salado Parkway
Tempe, AZ 85281

Please visit our project website at **azenergyfuture.com/ocotillo**

APPENDIX J-4 – DISPLAY ADVERTISEMENT

AROUND OUR SCHOOLS: TEMPE ELEMENTARY

Submitted by Tempe Elementary School District, www.tempeschools.org.

District news

» AIMS testing is this week. Please make sure your child is well rested and has eaten a nutritional breakfast.

Aguilar Elementary

» Come join us for our last hoorah Thursday, April 17, at Peter Piper Pizza at McClintock Drive and Baseline Road.

» Thanks to community member Albertsons and store Manager Stan Zoller for donating to our school.

» Show your school spirit and purchase a Wildcat Tumbler for $5 in the office.

Carminati Elementary

» Fifth-graders will study volcanoes April 14-17. They will make salt dough replicas and erupt them on Thursday afternoon.

Curry Elementary

» Field day is April 24.

Getz School

» On Tuesday, April 15, PTO will have a fundraiser from 5-8 p.m. at Rita's Italian Ice at Elliot Road and McClintock Drive.

Hudson Elementary

» Congratulations to three fifth-graders that met their personal accelerated reader goals. Billie Briner and Miguel Quijada have each read more than 2 million words and Steven Whitman has read more than 1 million. They all had to pass comprehension quizzes about the books.

Nevitt Elementary

» The Nevitt 40th Anniversary Celebration is 10 a.m.-noon Saturday, April 26. Events include school tours, choir performances and a dedication ceremony. Nevitt is at 4525 E. St. Anne Ave. Current and former students, parents, and educators are encouraged to attend.

Wood Elementary

» On April 4, the student body along with the Wood staff presented a pep rally preparing students for their AIMS testing.

Connolly Middle School

» Many sixth-grade students maintained a perfect 4.0 GPA for the first three quarters of this year. Congratulations go out to Naat'anii Castillo, Caio Dengi, Connie Davenport, Micah Fuse, Hannah Jones, Garett Kirwan, Samuel Leary, Ian Mitchell, Leah Nelson, Luke Philipps, Theodore Strich, Isabella Torres, Isabel Warriner, and Maren Wenger.

Gililland Middle School

» Congratulations to outstanding students of the month: Martin Burquez, Joelisa Silvas-Duran, Roberto Nitura, Marissa Brantley, Jareth Guillen-Cruz, Sione Tonga'uiha, Christopher Wesley, Anthony Aguilar, Juan Hernandez-Lagunas, and Paulina Barreras.

Tempe Academy of International Studies

» Field Day is Thursday, April 17.

» Variety Show will take place at 2 and 6:30 p.m. Tuesday, May 13.

ABM FLAP

Continued from Page 4

Robinson denies Whitcomb's allegation and said that Whitcomb informed him that she was recording their conversation in March.

"The real question is why doesn't Ms. Whitcomb simply provide the tape of our conversation to the public so this entire matter can be put to rest?" Robinson said. "Furthermore, if Ms. Whitcomb was so disturbed, why didn't she ask me to stop speaking, ask others in the room to stop me or simply walk out of the room or call the police? Wouldn't one of these be the reasonable thing to do unless, of course, you have other motives, one being to ensure I fail as president of ABM?" Whitcomb on April 7 denied recording the conversation.

At the April 2 annual meeting, longtime ABM attorney Dean Formanek affirmed that deed restrictions mandate use of the Ahwatukee Lakes property for golf-course-related businesses, such as a clubhouse, restaurant and pro shop. A material change requires approval of greater than 51 percent of the 5,073 property owners represented by ABM, Formanek said.

Formanek emphasized that ABM has no enforcement requirements and recommends not spending money on fighting the developer based on ABM's lack of jurisdiction.

STATE OF ARIZONA
COUNTY OF MARICOPA ss.

Pramila Kadvekar , being first duly sworn, upon oath deposes and says:

That she is the agent of Phoenix Newspapers Inc., publishers of

The Arizona Republic
Arizona Business Gazette

a newspaper of general circulation in the County of Maricopa, State of Arizona, published at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper

for a period of 1 { day } as follows:

APS advertisement appeared in the Arizona Republic
on April 9, 2014
1/2 page vertical black and white
Zone 10
ad#8197362
Cost - $141.36

5/9/2014 Pramila
Agent

Subscribed and sworn to before me this 9th day of May

A. D. 2014

CLAUDIA A. LAUCHNOR
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
June 30, 2017

My Commission Expires Claudia A. Lauchnor
Notary Public

Source of back pain vital to diagnosis

Question: My husband is prone to "throwing out" his back, and this is becoming increasingly more frequent. What exactly does that mean and when do we know it's time to see a doctor?

DR. AMON FERRY
SPORTS MEDICINE

Answer: Most of us have at some point or another "thrown out" our back. If your husband is prone to do this often, he might want to see a doctor sooner than later. The spine is composed of bones (vertebral bodies) and cushions in between (intervertebral disk). The posterior portion of the vertebral body creates a canal that runs from the skull all the way to the tail bone and protects the spinal cord and exiting nerves. There are small openings along the side of the spine to allow the nerves to exit the canal and travel to the rest of the body.

Back injuries are common. Ten to 15 percent of sports injuries involve the spine. Athletes who participate in such sports as gymnastics, rowing and football are at increased risk for back injuries. When someone has a back injury, we always try to determine the location of the pain generator. Pain that is confined to the low back often does not significantly affect the exiting nerve roots and is most commonly related to a muscle spasm. After a traumatic injury, lower-back pain can also arise from fracture of the vertebral body. Sharp, shooting, electrical pain that travels down the back of the leg into the foot is often termed "sciatica" and may result from a pinched nerve as it exits through the openings in the spinal canal.

Central to making the diagnosis is identifying the pain generator. The first step is a good physical exam by your doctor. Next, usually X-rays are obtained to see if any bones are out of alignment or if there is a fracture contributing to the symptoms. An MRI can give more detail about the soft tissue.

Dr. Amon Ferry practices with Valley Orthopedics. Reach him at 623-882-1292 or DrFerry@ValleyOrthoAz.com.

STATE OF ARIZONA
COUNTY OF MARICOPA ss.

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That she is the agent of Phoenix Newspapers Inc., publishers of

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for a period of 1 { day } as follows:

APS advertisement appeared in the Arizona Republic
on April 18, 2014
1/2 page vertical black and white
Zone 10
ad#8199144
Cost - $141.36

5/9/2014
Agent

Subscribed and sworn to before me this 9th day of May

A. D. 2014

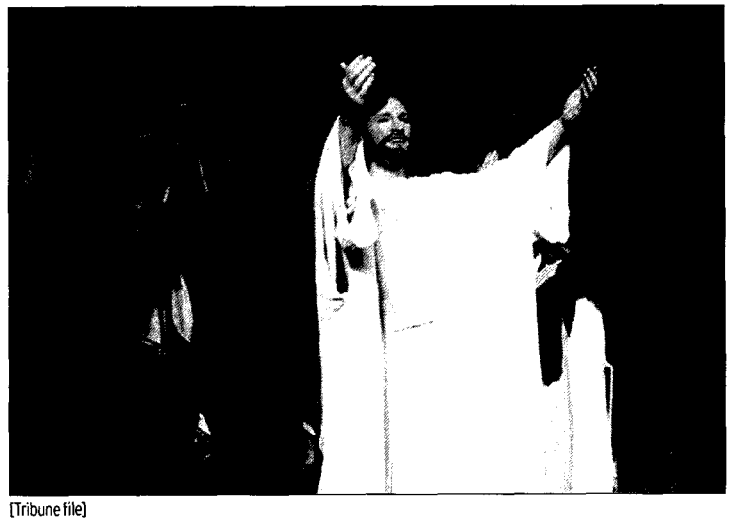
CLAUDIA A. LAUCHNOR
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
June 30, 2017

My Commission Expires

Notary Public

[MARK YOUR] calendar

For more of what's happening in the East Valley, visit us at **GetOutAZ.com.** While you're there, submit your events to our online calendar for free.



[Tribune file]

Mesa Arizona Easter Pageant: 'Jesus the Christ'

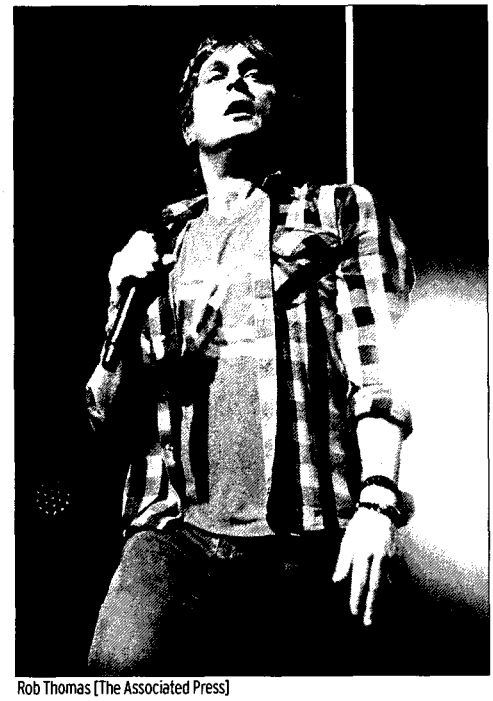
This annual production, put on by the Church of Jesus Christ of Latter Day Saints, is an East Valley tradition. Including a cast of hundreds, the 65-minute production, representing 32 scenes from the Old and New Testaments, draws around 75,000 spectators during its two-week run. The show is free of charge and is open to the public.
DETAILS » 8 p.m. Thursday and Friday, April 10-11, and 8 p.m. Tuesday through Saturday, April 15-19; a Spanish performance will be held at 8 p.m. Saturday, April 12. Mesa Arizona Temple Visitors' Center, 525 E. Main St. Free. EasterPageant.org.

"Oliver!"

Copperstar Reperatory stages Lionel Bart's musical rendition of Dickens' rags-to-riches classic, including the popular songs "I'd Do Anything," "Consider Yourself" and "Food, Glorious Food."
DETAILS » 7:30 p.m. Thursday and Friday, April 10-11, 2 p.m. and 7:30 p.m. Saturday, April 12. Mesa Arts Center, 1 E. Main St. $24 for adults, $22 for students and seniors, $18 for children 12 and younger; not recommended for children 6 and younger. (480) 644-6500 or MesaArtsCenter.com.

Rob Thomas

The lead singer from Matchbox Twenty performs in the Ballroom at Talking Stick Resort.
DETAILS » 8 p.m. Thursday, April 10. Talking Stick Resort, 9800 E. Indian Bend Road, Scottsdale. $38.39-$200.41. (480) 850-7734 or TalkingStickResort.com.



Rob Thomas [The Associated Press]

East Valley Home and Garden Show

This annual event at San Tan Village doles out tips on home improvement, including everything from kitchen revamps to solar power sourcing. You'll also see radio personalities – including KFYI's Jan D'Atri – broadcast live, while sampling free tastings or watching various chef demos.
DETAILS » 11 a.m. to 5 p.m. Friday, Saturday and Sunday, April 11-13. San Tan Village, 2218 E. Williams Field Road, Gilbert. Free. (800) 787-2248 or EastValleyHomeandGardenShow.com.

Hollywood Costume Party

See Phoenix Art Museum's largest and glitziest exhibit to date at this after-hours soiree jammed with local culture makers, costume designers and industry insiders. Guests are invited to don a costume imitating their favorite film star or movie character and spend the evening dancing, posing for paparazzi on the red carpet, and enjoying themed cocktails and light bites.
DETAILS » 7 p.m. Friday, April 11. Phoenix Art Museum, 1625 N. Central Ave. $25; includes admission, free parking, entry to the Hollywood Costume exhibition, food and costume contest registration. (602) 257-1880 or PhxArt.org.

AFFIDAVIT OF DISTRIBUTION

STATE OF Arizona)

COUNTY OF Maricopa)

CITY OF Mesa)

I, Terry Davenport, being duly sworn on oath now and during all times herein stated, have been the publisher and designated agent of the publication known as,

East Valley Tribune ("Publication")

And have full knowledge of the facts herein stated as follows:

The ad for APS ("Ad/Advertiser") was distributed to the Publication's full circulation on the 10 day of April, 2014.

By: Terry Davenport

Subscribed and sworn to before me
this 8 day of May, 2014.

Theresa DiBona
Notary Public

Notary Seal:

OFFICIAL SEAL
THERESA DIBONA
Notary Public - Arizona
Maricopa County
Expires June 10, 2014

ABOUT US

East Valley Tribune

The East Valley Tribune is published every Thursday and Sunday and distributed free of charge to homes and in single-copy locations throughout the East Valley. To find out where you can pick up a free copy of the Tribune, please visit www.EastValleyTribune.com.

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TODAY'S TALKERS

Gilbert woman convicted in hammer beating speaks to jury

An Arizona woman convicted of bludgeoning her husband to death with a hammer made a tearful plea for mercy Thursday, telling the jury deciding her fate that she is sorry for her actions and wishes she could go back and undo the pain she caused.

Marissa Devault, 36, broke down in tears and repeatedly lost her composure as she spoke to the jury in the penalty phase of her trial. The same jury that convicted her of first-degree murder is deciding whether she should get the death penalty or a life sentence.

"I don't know if I can be useful to anybody in this world or in any way ... but I would like the opportunity to try," she said.

Devault was found guilty last week in the killing of Dale Harrell, who suffered multiple skull fractures in the Jan. 2009 attack in the couple's home in Gilbert.

The penalty phase began this week and featured emotional testimony from Devault's daughters a day earlier.

Devault clasped a tissue, removed her glasses, took deep breaths and fought back tears for more than 10 minutes. She expressed regret for inflicting pain on her daughters, saying "this goes into generations that don't even exist yet."

Prosecutors say she killed her husband in a failed bid to collect on a life insurance policy to repay more than $300,000 in loans from her boyfriend, a man 20 years her senior she met on a sugar-daddy website.

Devault said she killed Harrell in self-defense and told investigators he had physically and sexually abused her in the past. She would become the third woman on Arizona's death row if the jury opts for the death penalty.

TEMPE

Former NFL star Darren Sharper denied bail

Even though he's being held in California, retired NFL star Darren Sharper was denied bail Thursday by a judge in Phoenix, a spokesman for the Maricopa County Attorney's office said.

Sharper, a five-time Pro Bowl player, faces five counts of drugging and raping three women in Scottsdale in November.

Sharper has been in jail in Los Angeles since February 27 facing similar charges. Thursday's ruling in Arizona makes it more likely that Sharper will be denied bail in the California case as well.

Sharper, 38, was being held on $1 million bail connected with charges of drugging and raping two women in the Los Angeles area, but Judge Renee Korn removed the bail and ordered him to remain in jail in March when an Arizona grand jury indicted him.

MESA

PD: Operation Bonded Ammo recovered stolen goods at Eazy Pick N Pawn

Mesa police say they've completed an operation resulting in numerous arrests and the recovery of hundreds of guns as well as thousands of stolen items at Eazy Pick N Pawn near Main Street and Alma School Road in Mesa.

Police said the operation targeted a pawn shop that allegedly trafficked nearly exclusively in stolen property.

Officers recovered approximately 300 guns and other items including TV's, gaming consoles, printers, coffee makers, gold and cash.

The operation began after a stolen handgun was located inside a vehicle during a traffic stop, police said. The driver was identified as Aaron Ellertson, owner of Eazy Pick N Pawn.

Investigators determined that stolen property was being run through the pawn shop on a daily basis, police said.

The investigation came to a close when detectives served search warrants at the locations owned by Ellertson, police said. Authorities are now going through the stolen property to determine the proper owner, police said.

Police say 16 arrests were made in conjunction with the operation dubbed "Bonded Ammo."

• From staff, wire and ABC15.com reports

AFFIDAVIT OF DISTRICTION

STATE OF Arizona)

COUNTY OF Maricopa)

CITY OF Mesa)

I, Terry Davenport, being duly sworn on oath now and during all times herein stated, have been the publisher and designated agent of the publication known as,

East Valley Tribune ("Publication")

And have full knowledge of the facts herein stated as follows:

The ad for APS ("Ad/Advertiser") was distributed to the Publication's full circulation on the 20 day of April, 2014.

By: Terry Davenport

Subscribed and sworn to before me
this 8 day of May, 2014.

Theresa DiBona
Notary Public

Notary Seal:

OFFICIAL SEAL
THERESA DIBONA
Notary Public - Arizona
Maricopa County
Expires June 10, 2014

No pierden la fe

Los integrantes de la Vigilia de Promise Arizona se reúnen cada semana para orar por una reforma migratoria y solidarizarse con los que hacen ayuno en Washington.

Los integrantes de la Vigilia de Promise Arizona en su más reciente reunión para rezar el rosario.

MARITZA LIZETH FÉLIX

Han estado al pie del cañón sin desfallecer. Han permanecido firmes a pesar de las críticas y los desaires. Se han escudado en la fe y han basado su lucha en su devoción. Ellos son los integrantes de la vigilia de Promise Arizona, que cuatro años después de su fundación siguen orando para pedir un cambio.

Cada semana, un grupo de activistas y creyentes se reúnen en diferentes lugares del Valle para rezar el rosario y clamar la ayuda de Dios en las cuestiones políticas que los afectan a ellos y a sus familias. El más reciente se realizó en la casa de Petra Falcón, la directora de Promise Arizona, quien dijo que esta reunión semanal les da paz y los ayuda a concentrarse mejor en la lucha.

Después de un ejercicio de oración en el que se recordaron las siete palabras de Jesús en su calvario hacia la crucifixión, los integrantes de la vigilia rezaron el rosario con muchísima fe, pidiendo la intersección divina a favor de una reforma migratoria y un alto a la separación de familias a través de las deportaciones. También le suplicaron a Dios que los mantenga fuertes en la fe para seguir luchando contra las injusticias y a favor de los derechos humanos, sin olvidar la piedad y el amor al prójimo.

Los ayudan a soñar

La coalición Developing Dreams ofreció un taller para que los jóvenes beneficiados del DACA puedan tener acceso a más oportunidades educativas y laborales.

MARITZA LIZETH FÉLIX

Fotos: José Muñoz

Varias organizaciones en pro de la educación y los derechos humanos se unieron para crear la coalición Developing Dreams (Desarrollando Sueños), a través de la cual se pretende ofrecer más ayuda e información para los jóvenes que quieren sobresalir en sus estudios.

Por ello, la semana pasada, en Phoenix realizaron una conferencia de desarrollo personal con enfoque en los estudiantes beneficiados con el programa de la Acción Diferida (DACA).

En el evento, especialistas les explicaron a los "soñadores" cómo redactar un currículo y una carta de presentación para impactar al reclutador y vender sus servicios en el mundo empresarial. También hablaron sobre cómo encontrar las vías para financiar sus sueños, conseguir becas y recaudar fondos para poder costear la universidad.

Al mismo tiempo, enfatizaron la importancia de crear relaciones sólidas y conectarse con personas que podrían de alguna manera u otra abrirles las puertas en el sector laboral.

Sin embargo, también les explicaron los contratiempos de los conflictos que pueden surgir con una mala entrevista o por diferencias en el área de trabajo y cómo manejar esas situaciones.

Estos son los estudiantes que respondieron a la convocatoria.

Los "soñadores" participaron activamente en las sesiones.

Caminan contra la violencia

Decenas de jóvenes han muerto víctimas de la delincuencia y sus familiares se unen para pedir un cese de la violencia en el Valle.

Algunos de los participantes en la caminata.

MARITZA LIZETH FÉLIX

Fotos: José Muñoz

A José Guzmán le mataron a su hijo en un acto de violencia que casi destruye a su familia. El dolor de la pérdida no ha desaparecido, pero han podido transformar esa impotencia en una causa que ayuda a otros padres que como ellos han tenido que enterrar a uno de los suyos, a través de la organización Padres y Parientes de Hijos Asesinados.

Desafortunadamente, la violencia arranca cientos de vidas cada año, muchas de ellas aquí en Arizona, donde cada día se escuchan noticias de tiroteos, asaltos y ataques. Cada una de las víctimas fue alguien para alguien... fue padre, hijo, esposo, amigo o pareja y su partida deja un hueco imposible de llenar. Pero para evitar que más familias sufran lo que José Guzmán sintió cuando asesinaron a su hijo adolescente, este fin de semana se llevó a cabo una caminata contra la violencia y a favor de la paz en Phoenix.

El evento se realizó el pasado 13 de abril saliendo del Capitolio Estatal. Las familias se vistieron con las camisetas blancas en solidaridad con la paz y para resaltar la misión de la organización. Paso a paso se recordaron los nombres de los que murieron a causa de la delincuencia y metro a metro se comprometían más con la misión; fueron cinco kilómetros de recuerdos, cientos de huellas unidas por el mismo dolor.

Guzmán les pidió a los padres de las víctimas, a los residentes y a las autoridades a que se unan a más actividades que promuevan la paz, no solo con caminatas, sino con acciones diarias. También les pidió que visiten la página de Internet www.hijosasesinados.org donde podrán obtener más información de los recursos disponibles para ellos a través de la organización.

Prensa Hispana

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Manny L. García President/Publisher

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA
COUNTY OF MARICOPA

Manny L. Garcia, being first duly sworn upon oath, deposes and says: That he is the owner and publisher of PRENSA HISPANA, a newspaper of general circulation in the County of Maricopa and the State of Arizona, published in Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement as published weekly in PRENSA HISPANA on the following dates:

ARIZONA Public Service (APS)
"Proyecto de APS para
Modernizar la Planta Ocotillo
MARTES, 22 de Abril de 2014
5:00 - 8:00 PM
ASU KARSTEN GOLF COURSE Clubhouse
1125 EAST RIO SALADO PARKWAY
TEMPE, AZ. 85281

INVOICE # 3182

Sworn before me this

17TH day of

APRIL, A.D. 2014

Manny L. Garcia
Owner & Publisher

Notary Public

MANUEL G. LABARGA
Notary Public - Arizona
Maricopa County
My Commission Expires
MAY 19, 2016

ASU gets new Sparkys

DIANA LUSTIG | THE STATE PRESS
A current Sparky mascot waits for the start of the Sparky tryouts in Wells Fargo Arena on April 9.

MEGANN PHILLIPS
@MEGANNPHILLIPS

The wood floor of Wells Fargo Arena, which was routinely used to accommodate Sun Devil basketball, volleyball, gymnastics and wrestling during winter months, had been neglected by the squeaking sneakers of competitive athletes since the arrival of spring—that is, until ASU athletics coordinators gave the arena a new purpose early last week.

With the end of the academic year quickly approaching, a special annual task —picking the University's next Sparky mascot — became necessary, and the Wells Fargo Arena provided the perfect atmosphere in which to do it.

From 5 to 6 p.m. April 8 and 9, Wells Fargo Arena welcomed 10 students who competed against each other to become ASU's mascot for the 2014-15 academic year. Three staff members from ASU's athletic department served as judges.

Josh Richard, the athletic department's revenue generation coordinator, enjoyed his job as a judge but kept Sparky's identity under wraps.

"We can't reveal the name of the man behind the mask," he said.

Sparky's true identity is one of ASU's best-kept secrets, because it is important to the University athletics department that Sparky's name remains untainted through the decades. However Richard revealed that five students, not one, are associated with Sparky at any given time.

Richard, who has been involved with choosing the "men behind the mask" for two years, said one student from each campus, plus an alternate, is chosen every year to fulfill Sparky's various obligations across ASU.

Two students who wore the costume in 2013-14 will return to wear it again in 2014-15, he said.

The two returning Sparkys attended tryouts alongside their less experienced competitors, but Richard said all of the aspiring Sparkys were given ample opportunity to hone their skills.

Many had been mascots at their respective high schools, he said, and the tryouts in the Wells Fargo Arena embraced a more educational than competitive atmosphere.

The 10 competing students engaged in a push-up contest and showed off their most impressive pitchforks while in the arena, but the decision about who would be Sparky next year was ultimately made after they attended an ASU baseball game in costume.

While in the Sparky suit, students are expected to capture the attention of enormous audiences and inspire University pride, and this is exactly what each of the prospective Sparkys attempted to do at three baseball games vs. Cal from April 11 to April 13.

"We want Sparky to be personable, active and athletic," Richard said. "He should walk with confidence and swagger."

Conrad Bradburn, an athletics department manager who has judged previous Sparky tryouts, said school spirit was also a heavily weighted criterion.

"Important personality traits for Sparky are, first and foremost, a passion for ASU and pride in being a Sun Devil," he said. "Sparky is a big part of the game atmosphere, and he can really help energize the fans and create a home field advantage."

Eventually, the students who best portrayed all of these characteristics were selected.

Nursing freshman Michaela Denniston said she hopes future Sparkys will be able to maintain the same energy past Sparkys have brought to the table, and she said she looks forward to seeing them in action next year.

"This year, Sparky did an amazing job," she said. "I'm a big fan of Sparky, and I love how he keeps everyone going at all the games. He made each event he was at more exciting."

Contact the reporter at megann.phillips@asu.edu

APPENDIX J-5 – OPEN HOUSE MEETING

OCOTILLO POWER PLANT MODERNIZATION PROJECT

OPEN HOUSE SUMMARY 4.22.14

The Ocotillo Modernization Project open house was held Tuesday, April 22, 2014 from 5-8 p.m. at the ASU Karsten Golf Course Clubhouse located at 1125 E. Rio Salado Parkway, Tempe, AZ 85281.

A team of nearly 20 APS employees and contractors supported the event as experts, support staff and security.

Open House

About 40 registered guests attended, including neighborhood residents and prospective vendors.

Four written comments were received, three of which were positive/supportive of the project. The other comment requested trees tall enough to screen the new units from the neighborhood.

The team was impressed with attendees' questions about all facets of the project. Of note, five people had questions about the fate of the Christmas lights that are hung from the steam units each year.

Outreach

The multi-media communications plan reached a total audience of nearly 390,000 leading up to the open house.

- Public notification advertising: Ads were placed in four newspapers, on six dates reaching a total circulation of 290,342.

Newspaper	*Dates Published*	*Total Circulation*
AZ Republic Tempe/Ahwatukee zone	April 9, April 18	38,568
ASU State Press	April 17	20,000
East Valley Tribune	April 10, April 20	166,774
Prensa Hispanic	April 17	65,000

- Project postcard: A postcard introducing the project was mailed to 64,000 addresses within a 2-mile radius of the Ocotillo Power Plant in March 2014.

- Project newsletter: The open house newsletter was mailed to 59,000 addresses within a 2-mile radius of the Ocotillo Power Plant on April 8, 2014; the discrepancy in addresses from the previous mailer takes into consideration undeliverable postcard addresses.

- Facebook – The open house was promoted to 33,549 users in Tempe from April 16-21, 2014 resulting in 512 clicks-thrus to the Ocotillo web page on azenergyfuture.com. Display boards from the open house are available on azenergyfuture.com.

- Twitter – An open house tweet was posted April 21, 2014 to 6,866 @apsFYI followers.

Summary

Overall, people seem to be interested in the project and satisfied with what they've seen of the plans so far. APS will continue to work to keep that momentum rolling through the permitting process.

OCOTILLO GENERATION PROJECT

aps

APS is planning to modernize the Ocotillo Power Plant in Tempe.

The proposed project will create a cleaner-running, more efficient plant using advanced technology to retire 1960s-era units.

The project provides several benefits, including:

- **Supporting service reliability in the Phoenix metro area**
- **Being better for the environment**
- **Creating construction jobs and additional tax revenue for the local economy**

Key Project Details

- Install five 102-MW gas-fired combustion turbines
- Retire and remove two 110-MW gas-fired steam generators, built in 1960
- Maintain in service two 55-MW gas-fired combustion turbines
- Remove steam cooling towers used by current generators and oil storage tanks

Generation Benefits

- Upgrades Ocotillo's generation capabilities with advanced, high-efficiency technology
- Maintains reliability and key generation source in Phoenix load center
- Enhances responsiveness with quick-start generators
- Site allows for integration of renewable resources to APS generation portfolio
- Increases generation capacity from current 330 MW to 620 MW

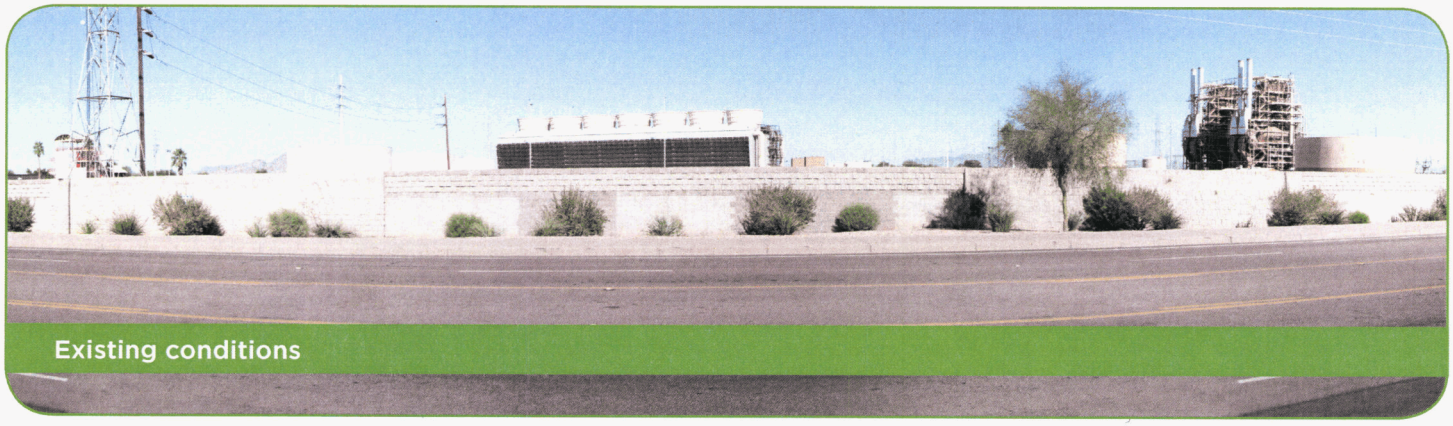
Environmental Benefits

- Decreases plant's water-use and emission rates
- Improves overall plant noise conditions
- Reduces size of power plant stacks to about half the size of existing facilities
- Upgrades generating capacity without increasing plant footprint

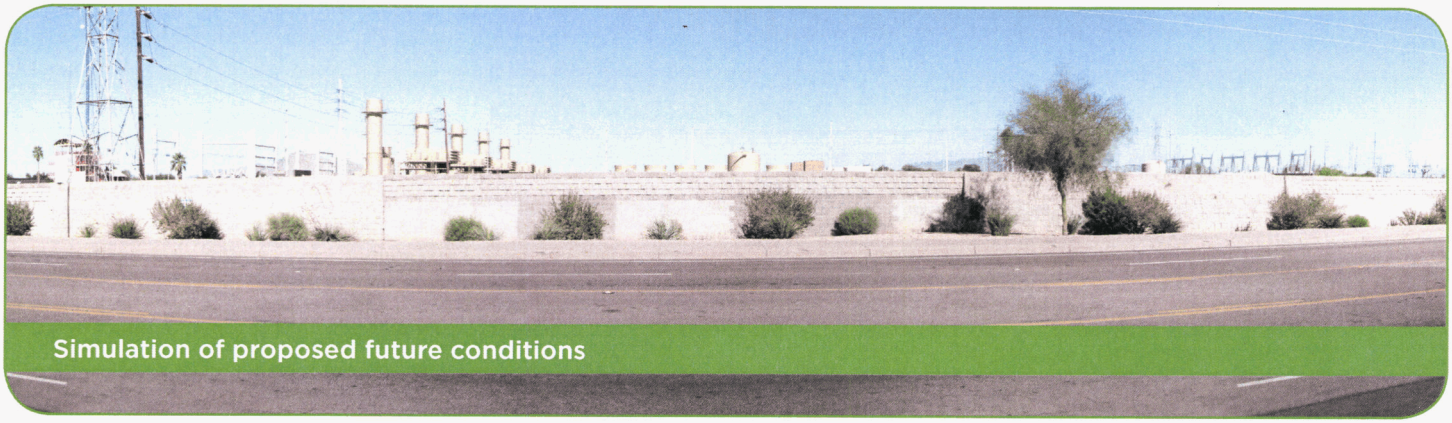
Economic Benefits

- Provides an average of 114 jobs during construction
- Generates an estimated $3 million in total property taxes in first year of operation, increasing to $8 million by fifth year

Ocotillo Generation Project



Existing conditions



Simulation of proposed future conditions

View from University Drive looking north

Proposed Timeline

2014 »

- Begin stakeholder engagement (February)
- Initiate permit processes with City of Tempe and Maricopa County (March)
- File application for Certificate of Environmental Compatibility (August) with Arizona Corporation Commission

2016 »

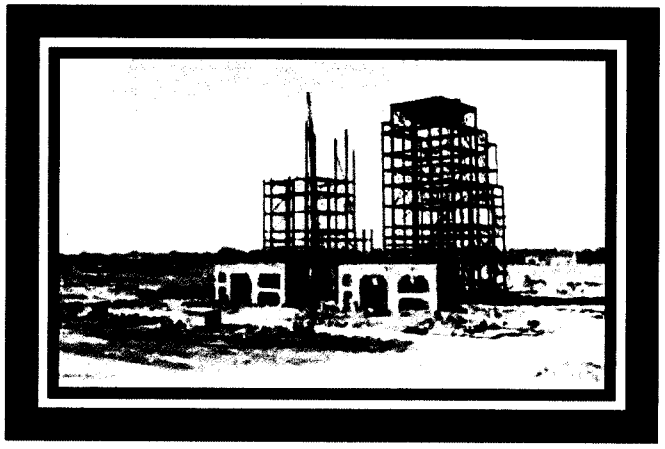
- Remove oil storage tanks
- Begin construction of new generation units

2018 »

- Place new generation units into production
- Begin to dismantle and remove current steam generators and related infrastructure

aps

Welcome to the Ocotillo Modernization Project Public Open House

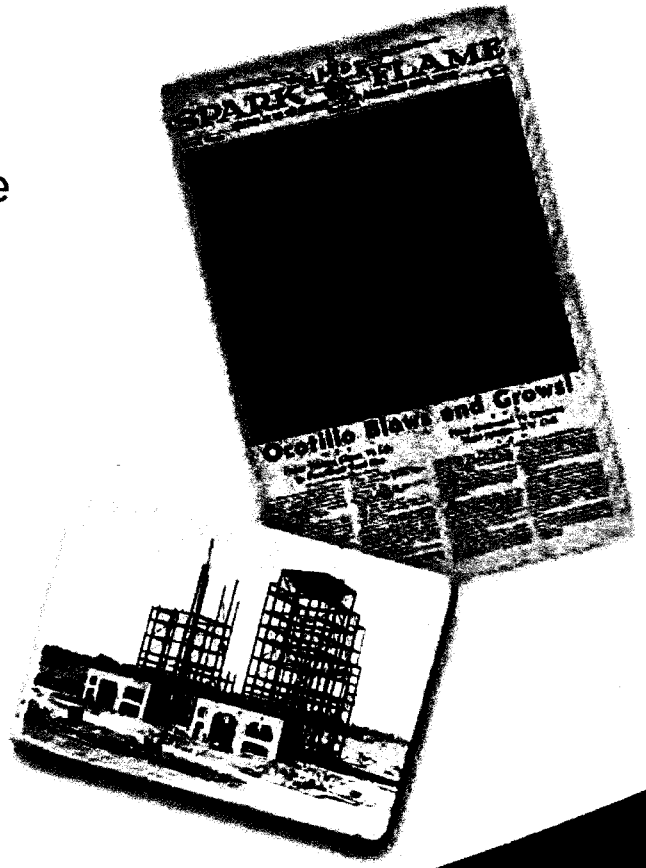


April 22, 2014

aps

Plant History

- Two 110-megawatt (MW) steam generators were constructed in the late 1950s
- Began operating in 1960
- Played significant role in bringing power to growing Phoenix area
- Two 55 MW gas turbines were added to the site in 1972 and 1973
- Both steam and gas turbine units use natural gas as fuel source
- Host for solar testing and research facilities for over 25 years



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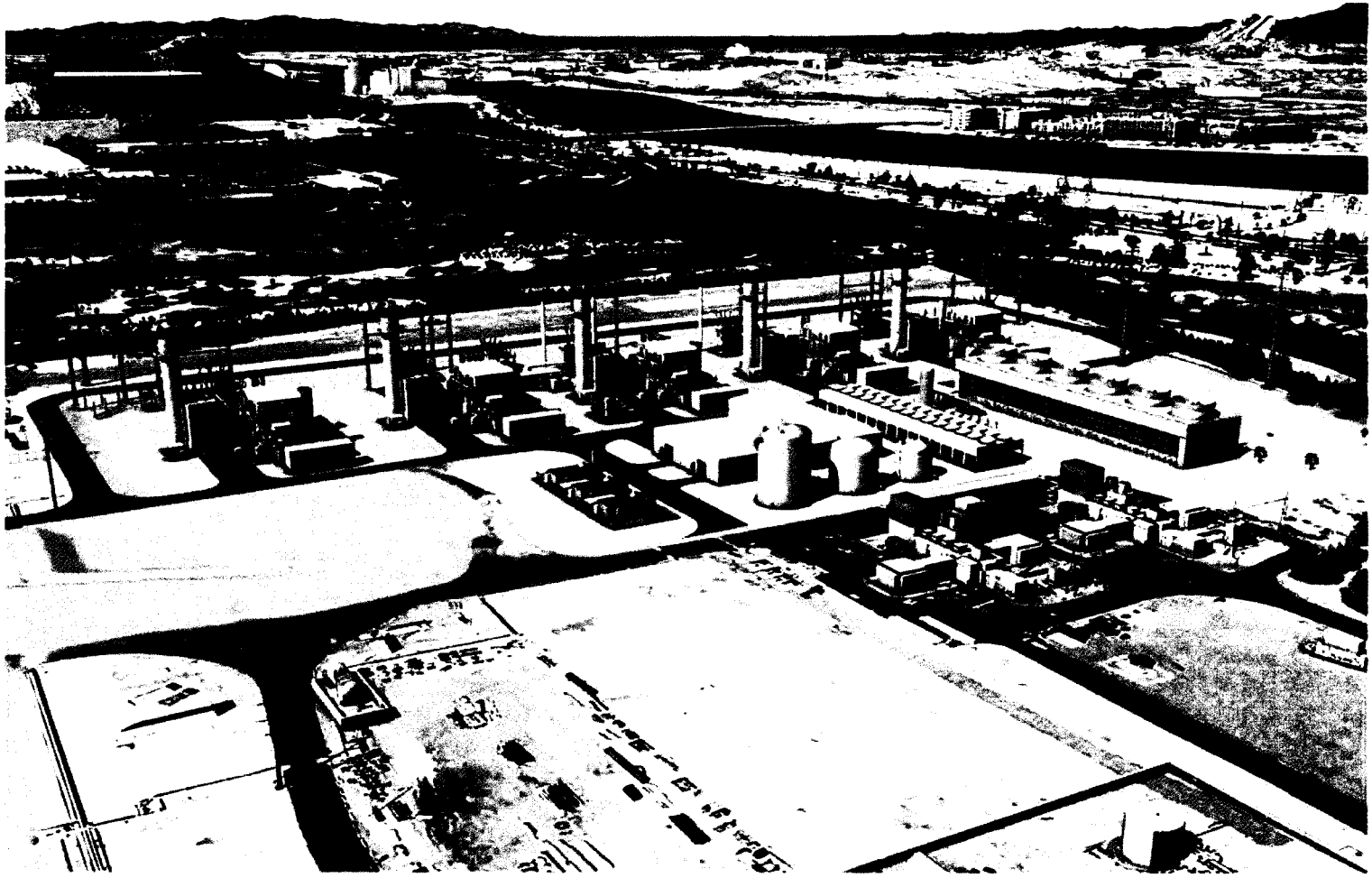
Overview of the Future



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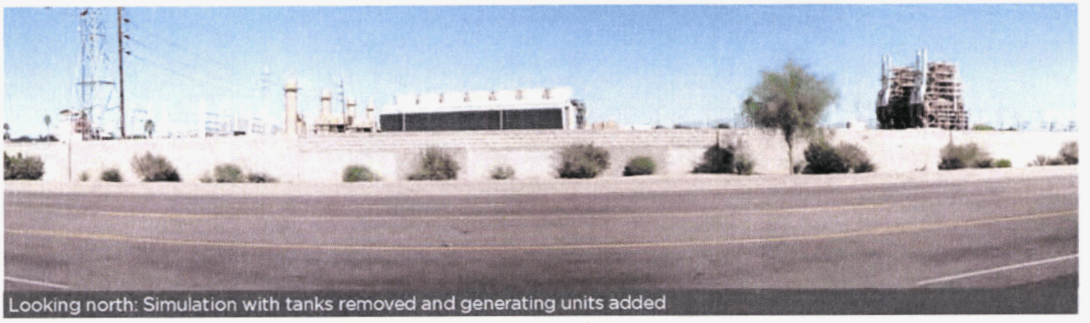
Project Purpose

- Retire existing, aging steam units (220 MW)
- Replace steam units with modern technology
- Maintain metropolitan area reliability and flexibility to meet customer energy needs
- Increasing demand for power
- Responsive unit operations
  - Quick start-up and ramp-up time
  - Increase APS' ability to integrate growth in renewable energy sources

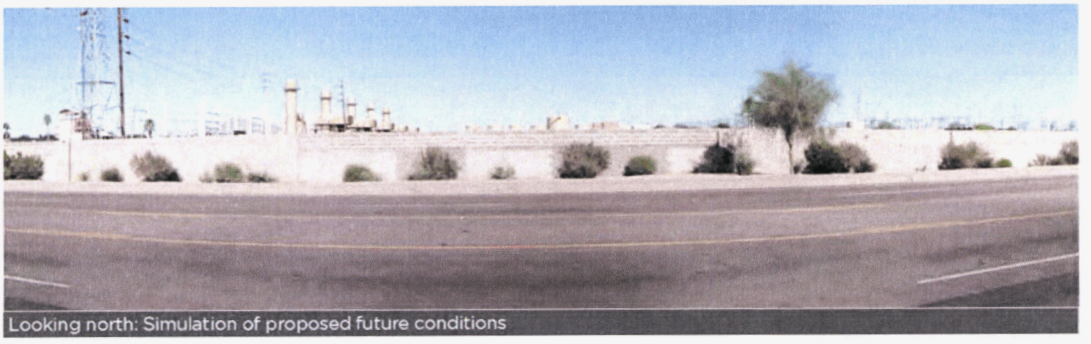
aps

View from University Drive

Looking north: Existing conditions



Looking north: Simulation with tanks removed and generating units added



Looking north: Simulation of proposed future conditions

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View from
Grigio Tempe Town Lake Apartments

Looking southeast: Existing conditions

Looking southeast: Simulation with tanks removed and generating units added

Looking southeast: Simulation of proposed future conditions

aps

View from ASU Center B Building Parking Lot

Looking northeast: Existing conditions

Looking northeast: Simulation with tanks removed and generating units added

Looking northeast: Simulation of proposed future conditions

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Project Location

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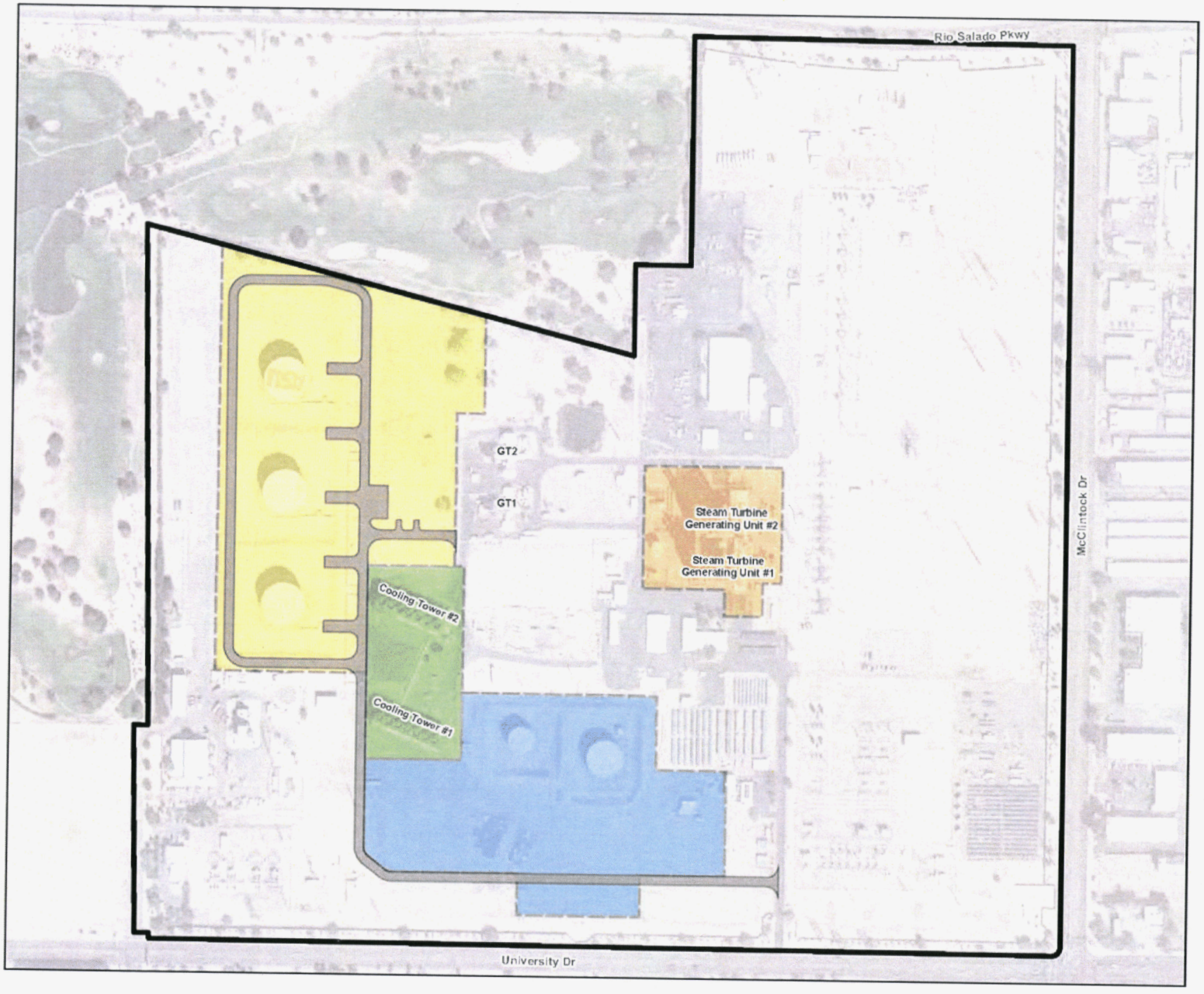

Primary Construction Areas

Ocotillo Modernization Project

Legend

- Ocotillo Power Plant

Primary Construction Areas

- Temporary Construction Offices, Laydown and Parking Areas
- Main Construction Area for New Generating Units
- Cooling Towers Removal Area
- Steam Turbine Generating Unit Removal Area
- Internal Access Road

GT = Gas Turbine Generator

N

0 150 300

Feet

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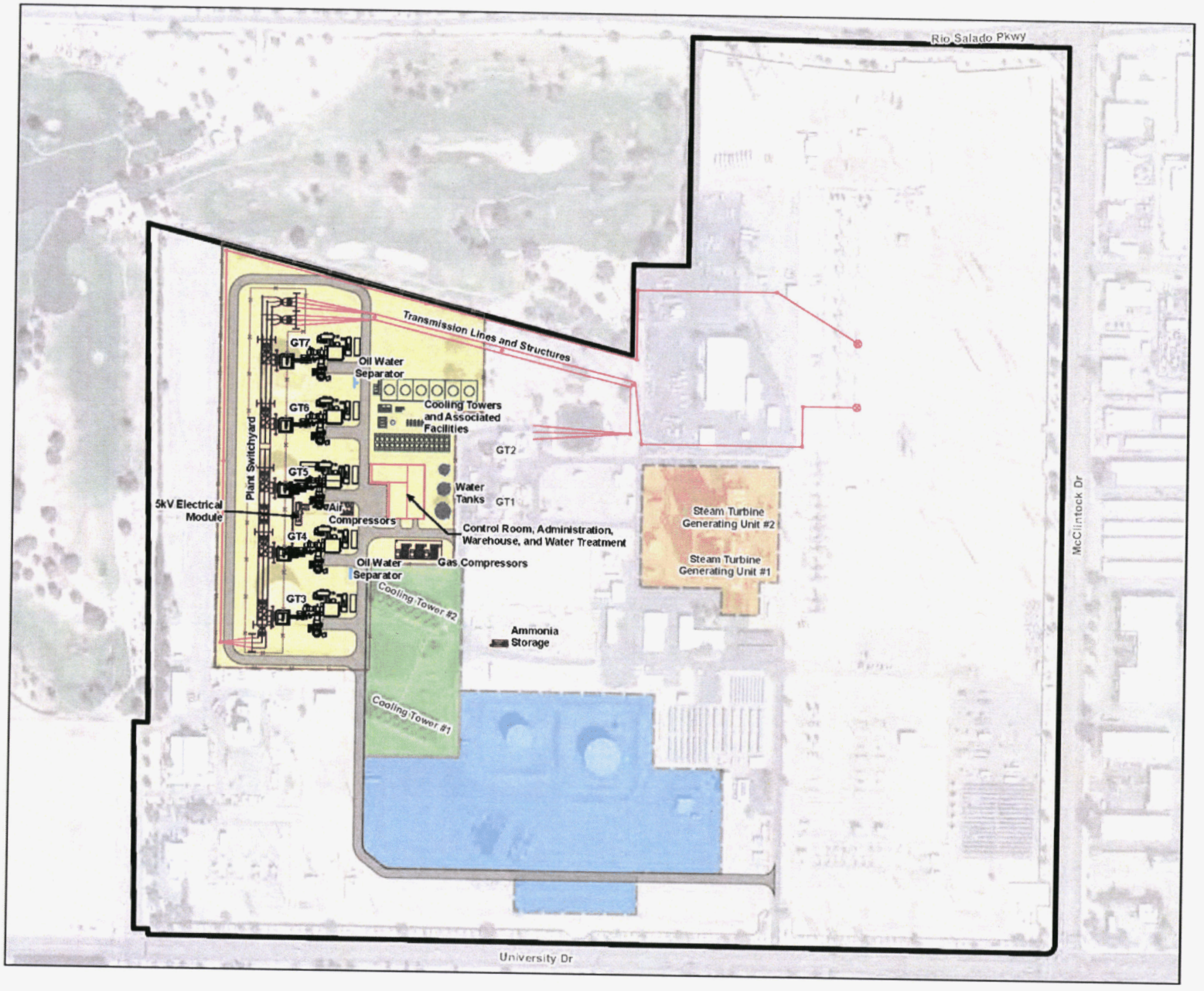

Proposed Site Layout

Ocotillo Modernization Project

Legend

- Ocotillo Power Plant

Proposed Site Layout

- Proposed GT
- Control Room, Administration, Warehouse, and Water Treatment
- Cooling Towers and Associated Facilities
- Oil Water Separator
- Transmission Lines and Structures
- Water Tanks
- Other Plant Features
- Fence

Primary Construction Areas

- Temporary Construction Offices, Laydown and Parking Areas
- Main Construction Area for New Generating Units
- Cooling Towers Removal
- Steam Turbine Generating Unit Removal
- Internal Access

GT = Gas Turbine Generator

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Feet

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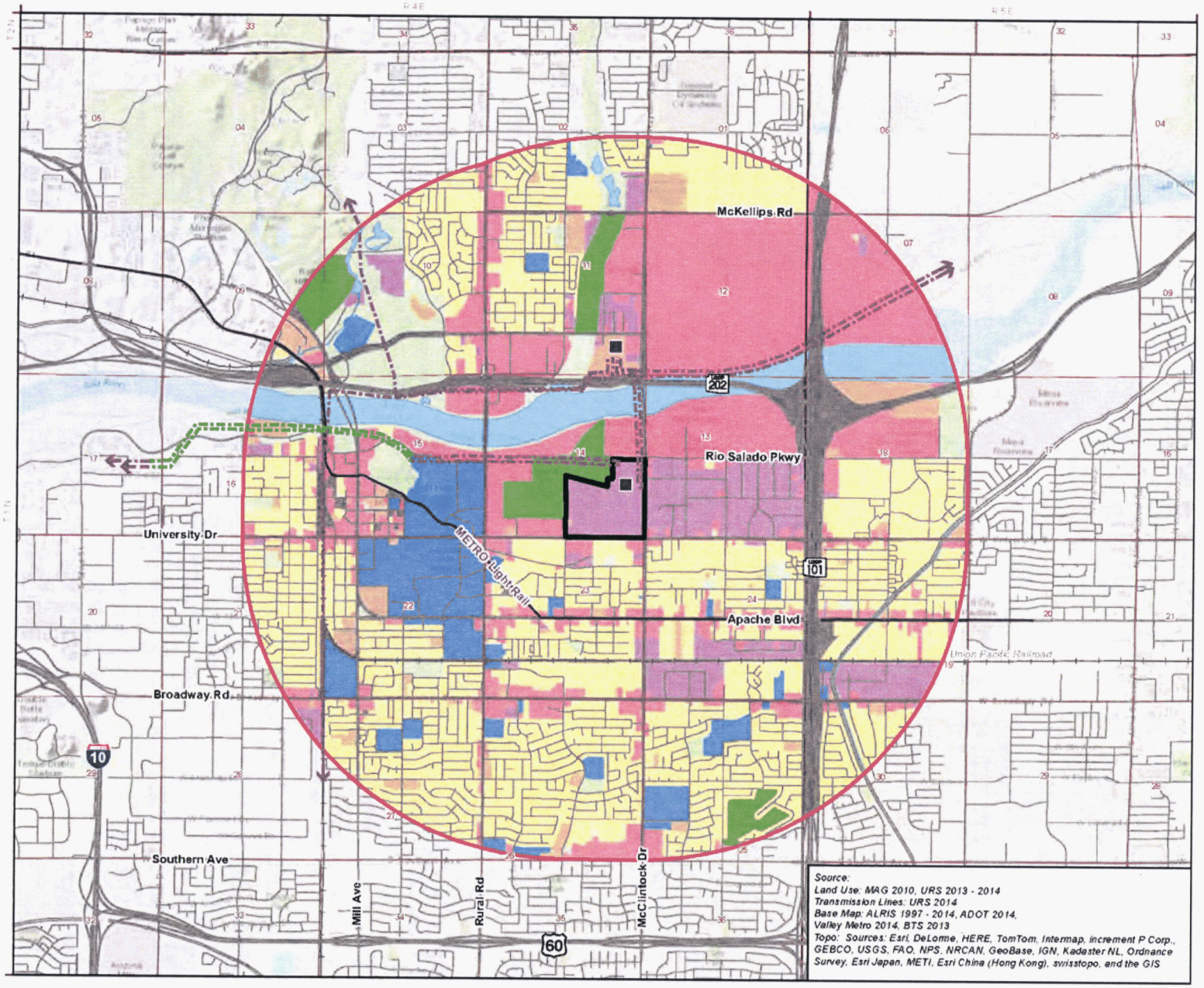

Future Land Use

Ocotillo Modernization Project

Legend

- Ocotillo Power Plant
- Project Study Area (2-mile Buffer)
- Overhead Transmission Line
- Underground Transmission Line
- Existing Substation \ Switchyard

Future Land Use

- Residential
- Commerical / Mixed Use
- Industrial
- Educational
- Public or Quasi-public / Military
- Transportation
- Golf Course
- Open Space
- Water

General Features

- Road
- Railroad
- Township and Range Boundary
- 22 Section Boundary

N

0 0.5 1

Miles

aps

Permitting Requirements

Permit	Agency	Application Date to be Filed
Air Permit	Maricopa County Air Quality Department	Spring 2014
Certificate of Environmental Compatibility (CEC)	Arizona Corporation Commission (ACC)	Summer 2014
Use Permit	City of Tempe	Summer-Fall 2014
Building Permit	City of Tempe	Fall 2015
Aquifer Protection Permit Revision	Arizona Department of Environmental Quality (ADEQ)	2015

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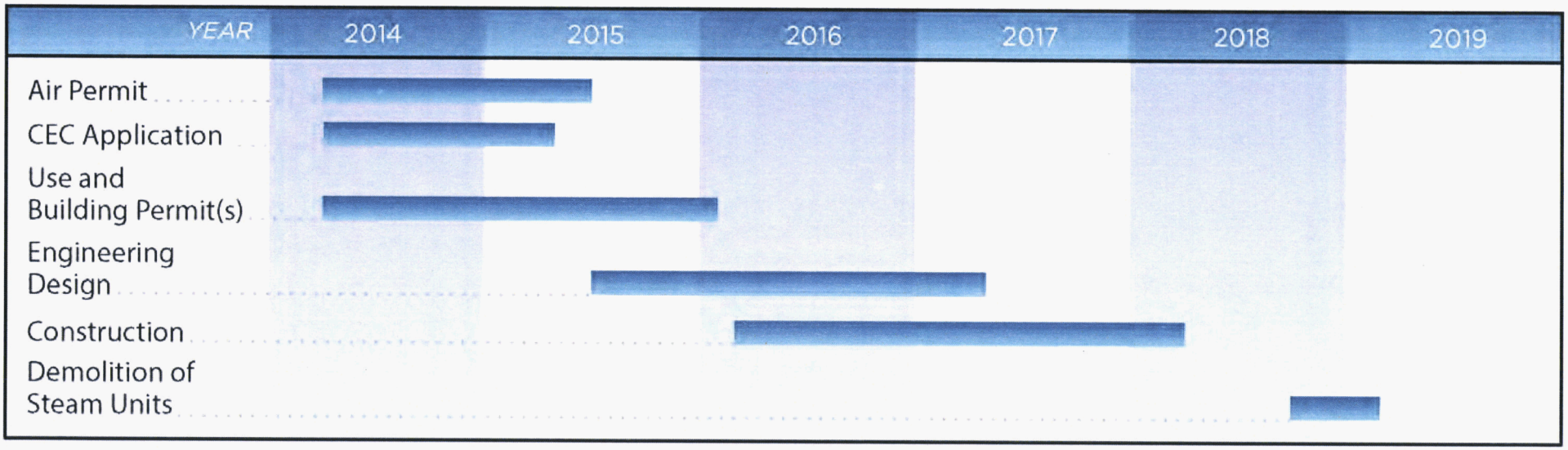
Schedule



aps

Ocotillo Power Plant Capacity

Type of Generating Unit	Year in Service	Existing Ocotillo Power Plant		Future Ocotillo Power Plant	
		Number of Generating Units	Power-Generating Capacity	Number of Generating Units	Power-Generating Capacity
110 MW Steam Generator (aging generation to be removed)	1960	2	220 MW	0	---
55 MW Gas Turbine Generator	1972, 1973	2	110 MW	2	110 MW
102 MW Gas Turbine Generator (new to be added)	2018*	0	---	5	510 MW
Total			**330 MW**		**620 MW**

** All Gas Turbine Generators are anticipated to be in service by this date*

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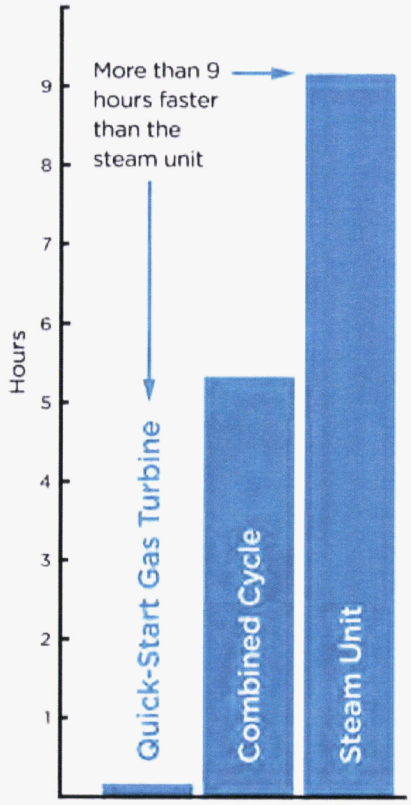
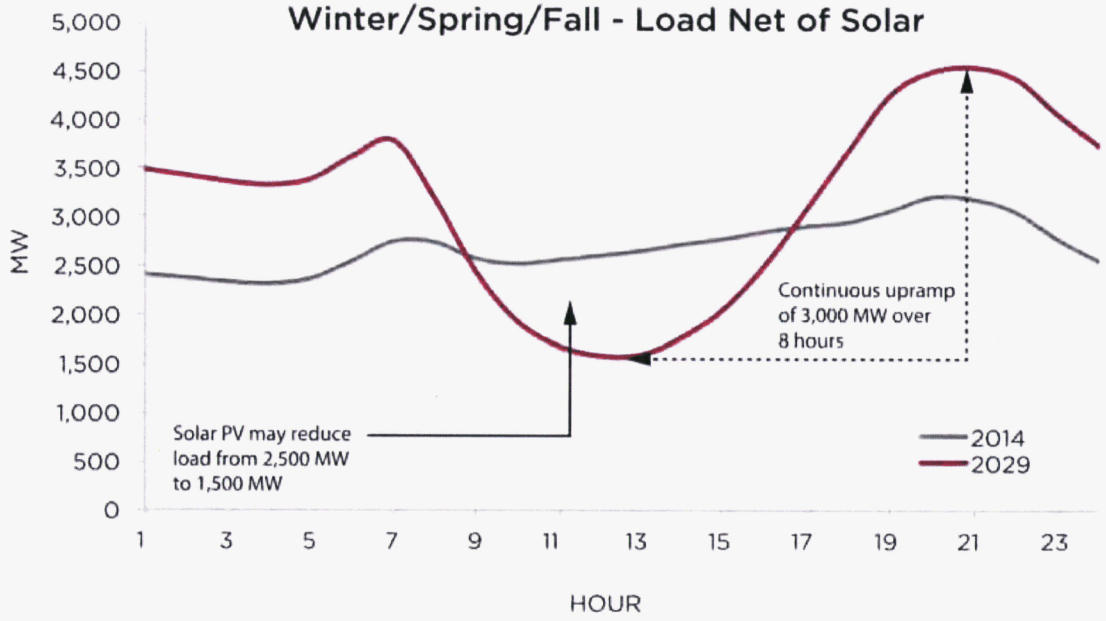
Evolving Customer Demand and Markets

Start-up Times – Hours from Cold-start to Maximum Output



Comparison of Start-up Times

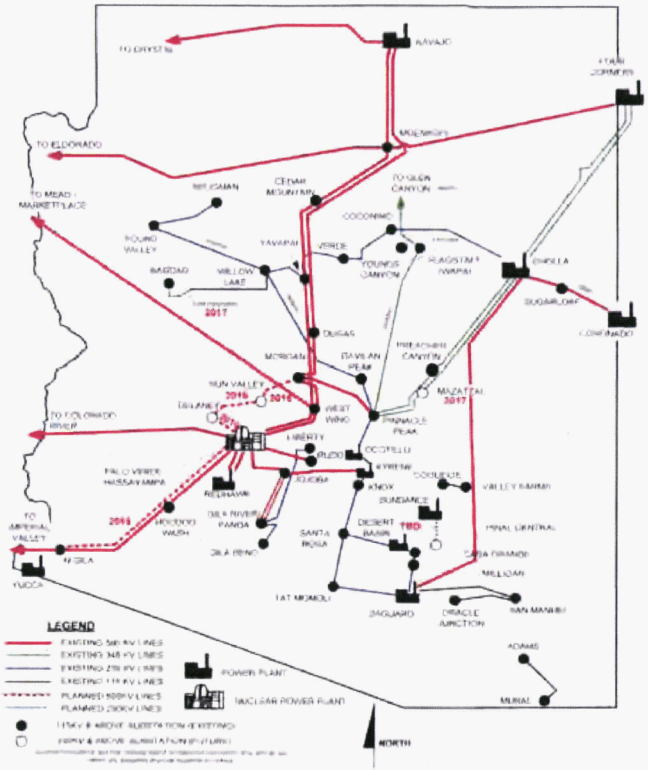


Winter/Spring/Fall – Load Net of Solar

aps

Generation and Transmission System Balance

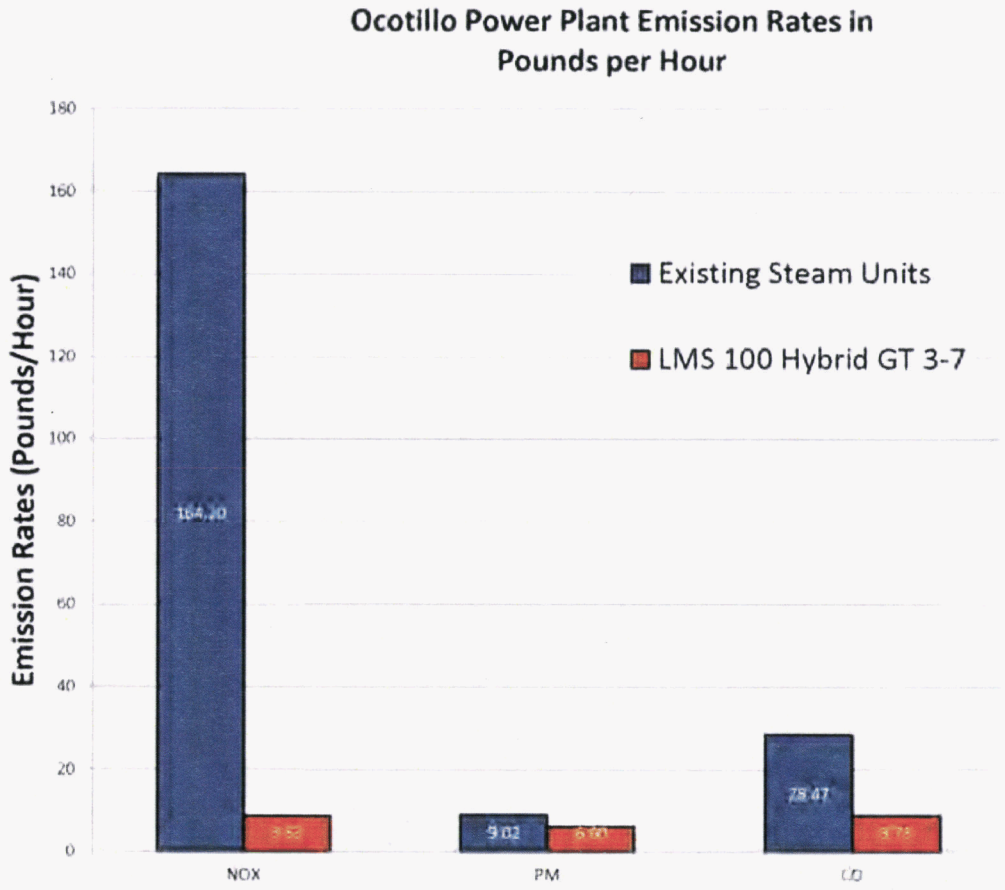
- Electric generating resources help balance the flow of power around the state
- Grid built to balance sources of energy
  - Palo Verde and natural gas generators are located West of Valley while coal generators are located North and East
- Generation additions or retirements change this balance
- Generation close to customer demand center (metro-Phx) improves transmission import capabilities and maintains a balanced system



aps

Air Emissions

- Air permit revision submitted to Maricopa County in April
- Proposed new units are projected to have limited run time
- Proposed new units are the most efficient, commercially-available gas turbines on the market
- State-of-the-art emissions control technology



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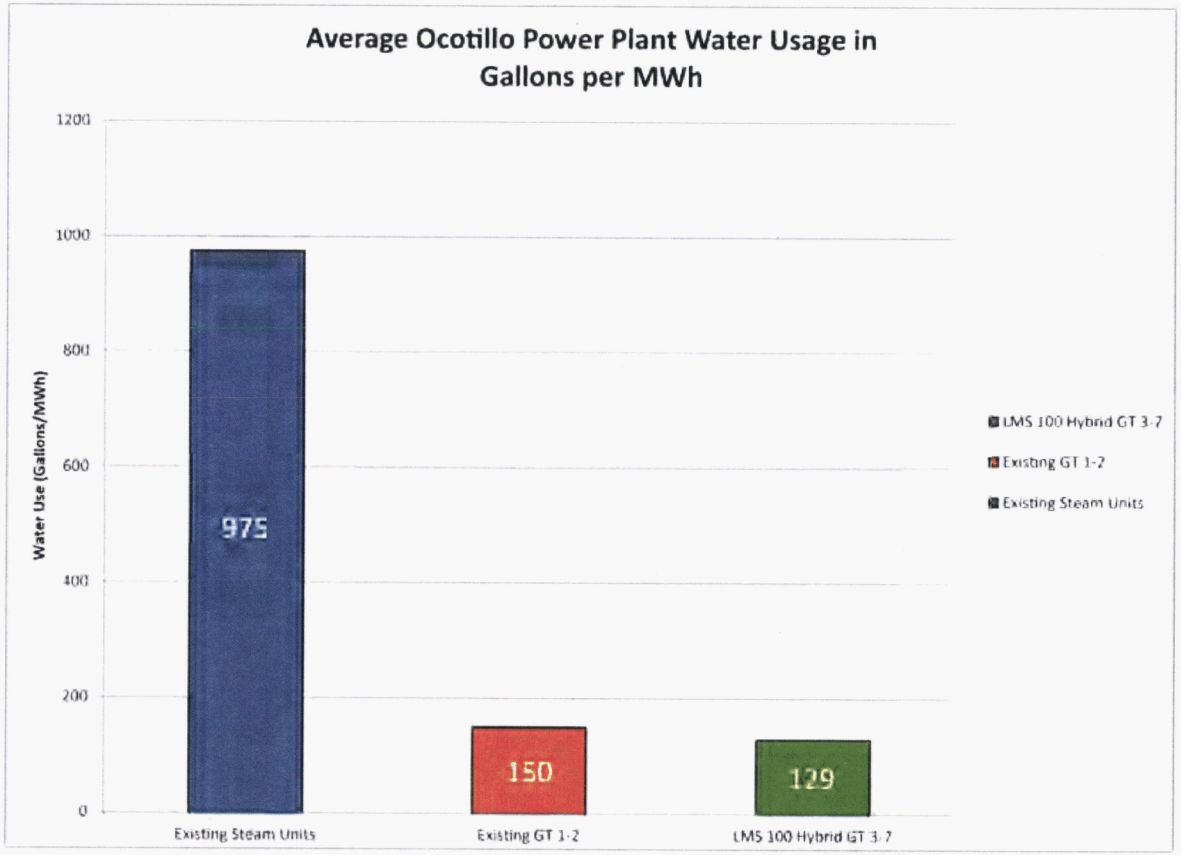
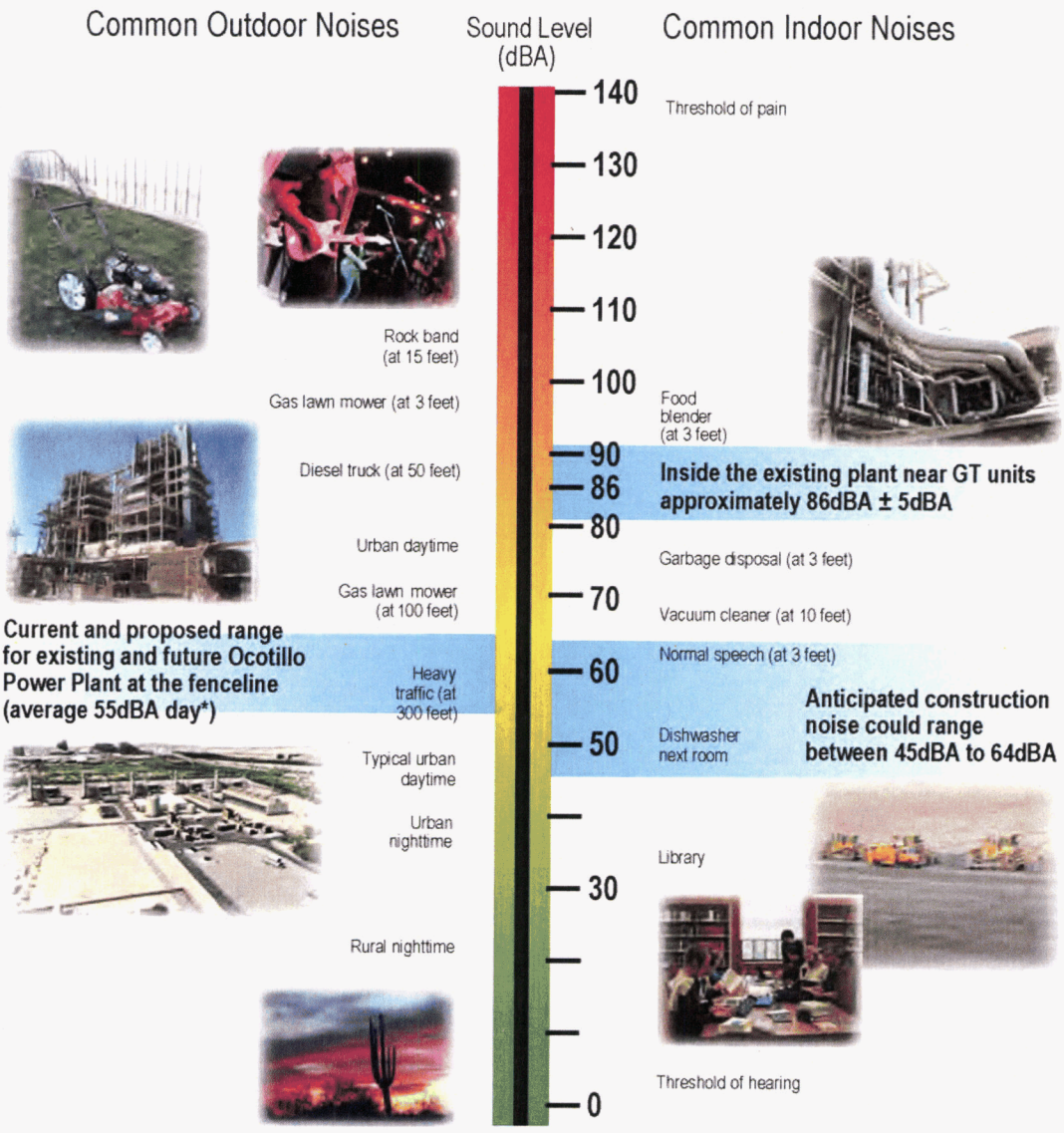
Water Usage

- Existing groundwater usage based on an average of historic data for a 20-year period
- Rate of water use (g/MWh) reduced approximately 80%



Data for the groundwater usage provided by APS for Ocotillo Power Plant

Common Indoor and Outdoor Noise Levels



Note: Sound is perceived differently by every individual

Project to comply with City of Tempe Noise Ordnance Section 20-4 (9) and current noise permit for Ocotillo Power Plant

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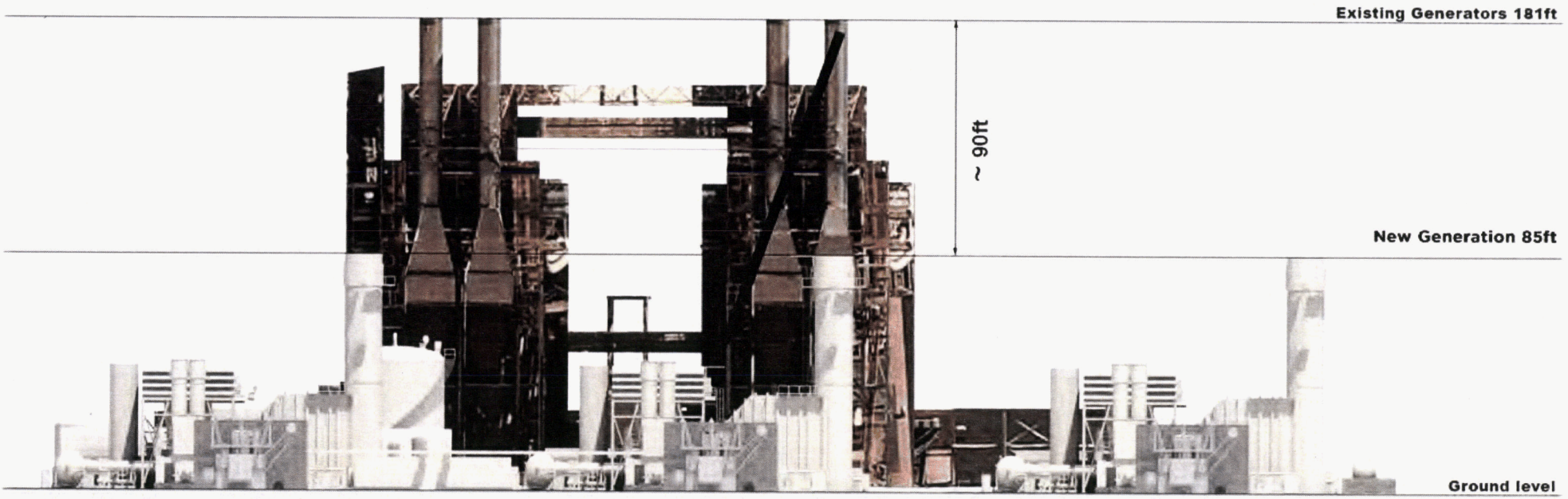
Gas Turbine Generator Stack Height Comparison

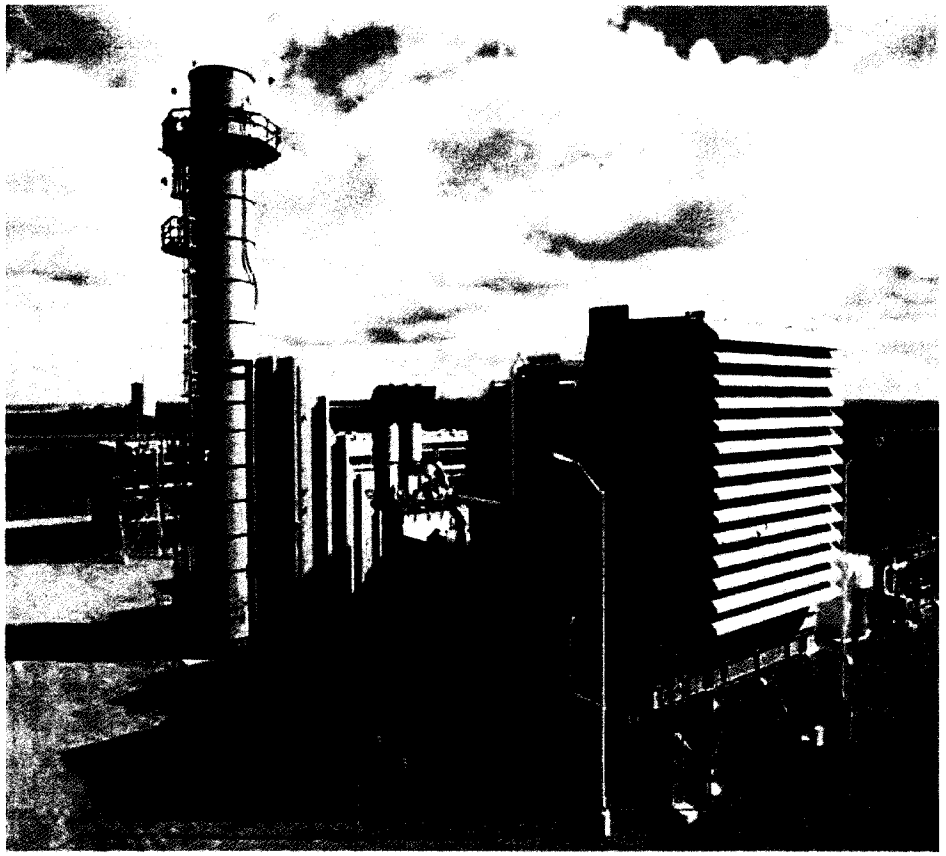


Actual above-ground height of new stacks will be established during final stage of design.

aps

Benefits of the New Gas Turbines

- General Electric Model LMS100PA gas turbines
  - Lower emission rates
  - Improved fuel efficiency
  - Small and compact
  - Hybrid cooling system saves water



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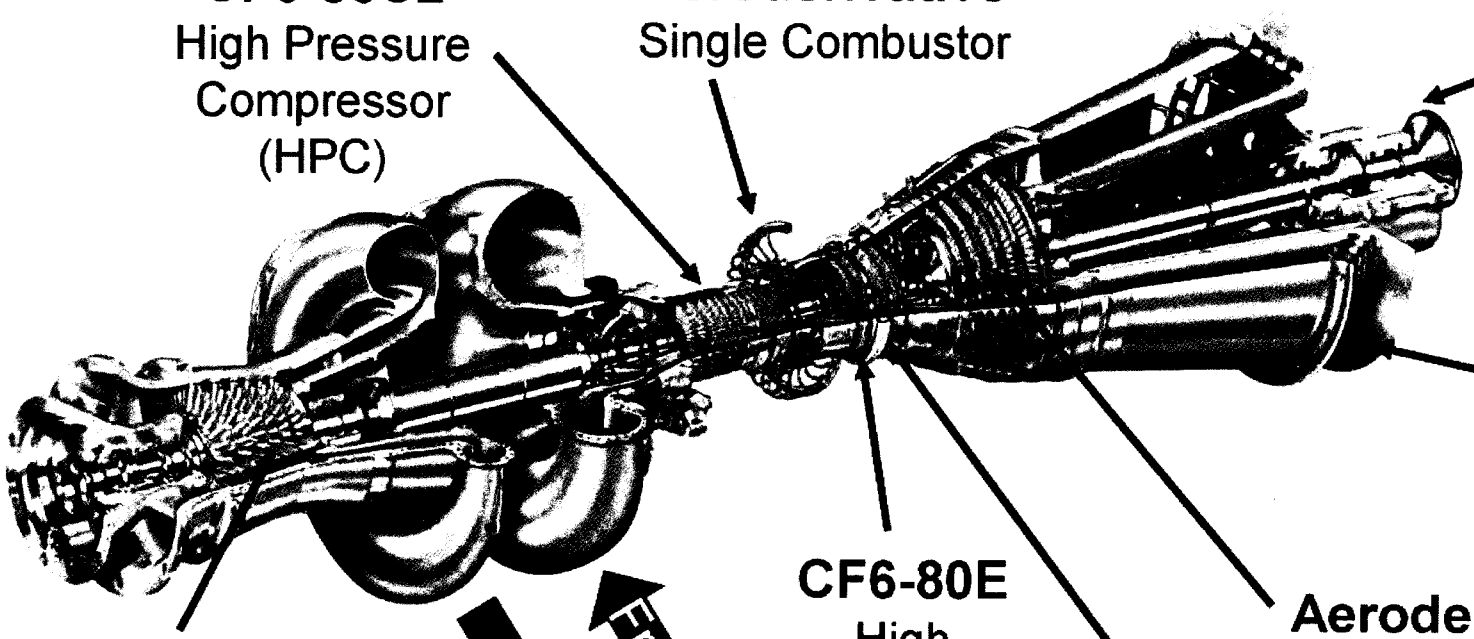
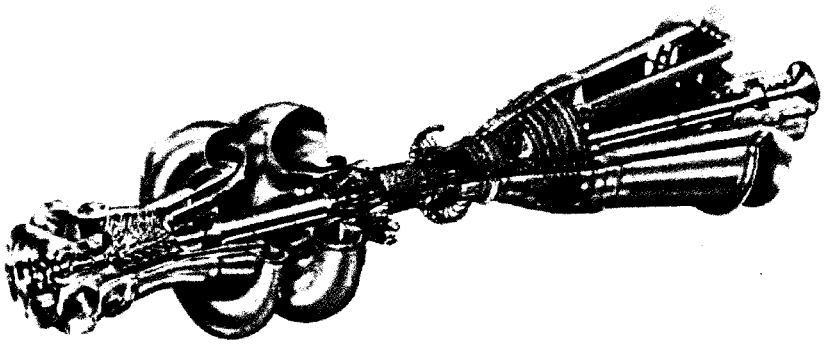
GE LMS 100 Proven Technologies

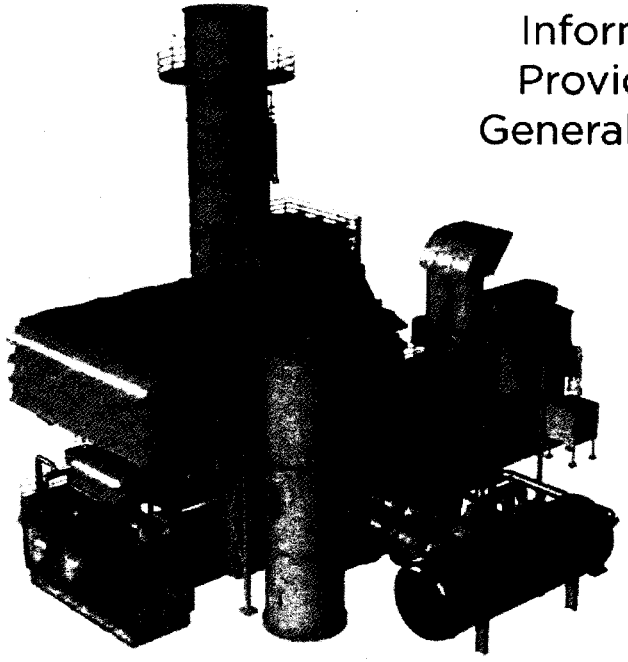
Integrated in a 3-shaft 100+ MW gas turbine package



Information Provided by General Electric

GE LMS 100 Technical Data





Information Provided by General Electric

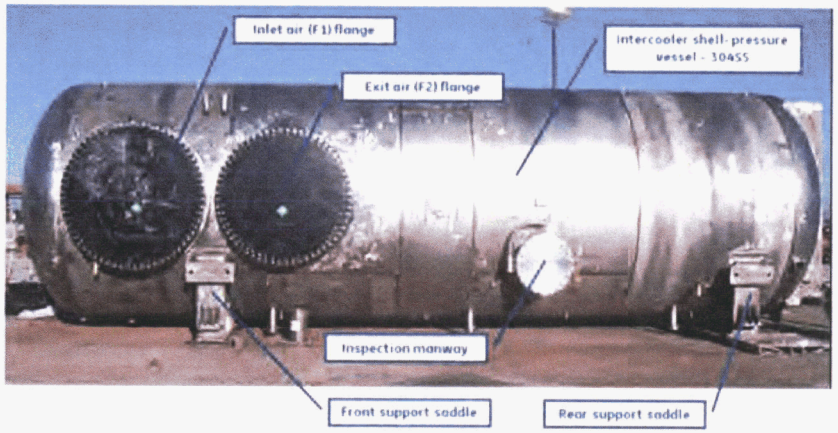
Description	60Hz
Turbine Speed (RPM)	3600
Output (MW)	104
Heat Rate (BTU/kWh)	8090
Efficiency	43%
Exhaust Flow (lbs/sec)	499
Exhaust Temp (F)	760
Compression Ratio	42
Water Injection (gpm)	51
Gas Pressure (@Pkg, psig)	850
Heat Rejection (MMBTU/hr)	110
Ramp Rate	50 MW/min (no maint. penalty)
Mature Reliability/Availability	99.2 / 97.1
Package Footprint	113 ft x 73 ft

Conditions (*With water injection): Performance at the generator terminals; 59F or 15C; 60% RH; No losses; Fuel spec. gas (LHV = 19,000 BTU/lb)
Heat rejection includes intercooler and lube oil cooling

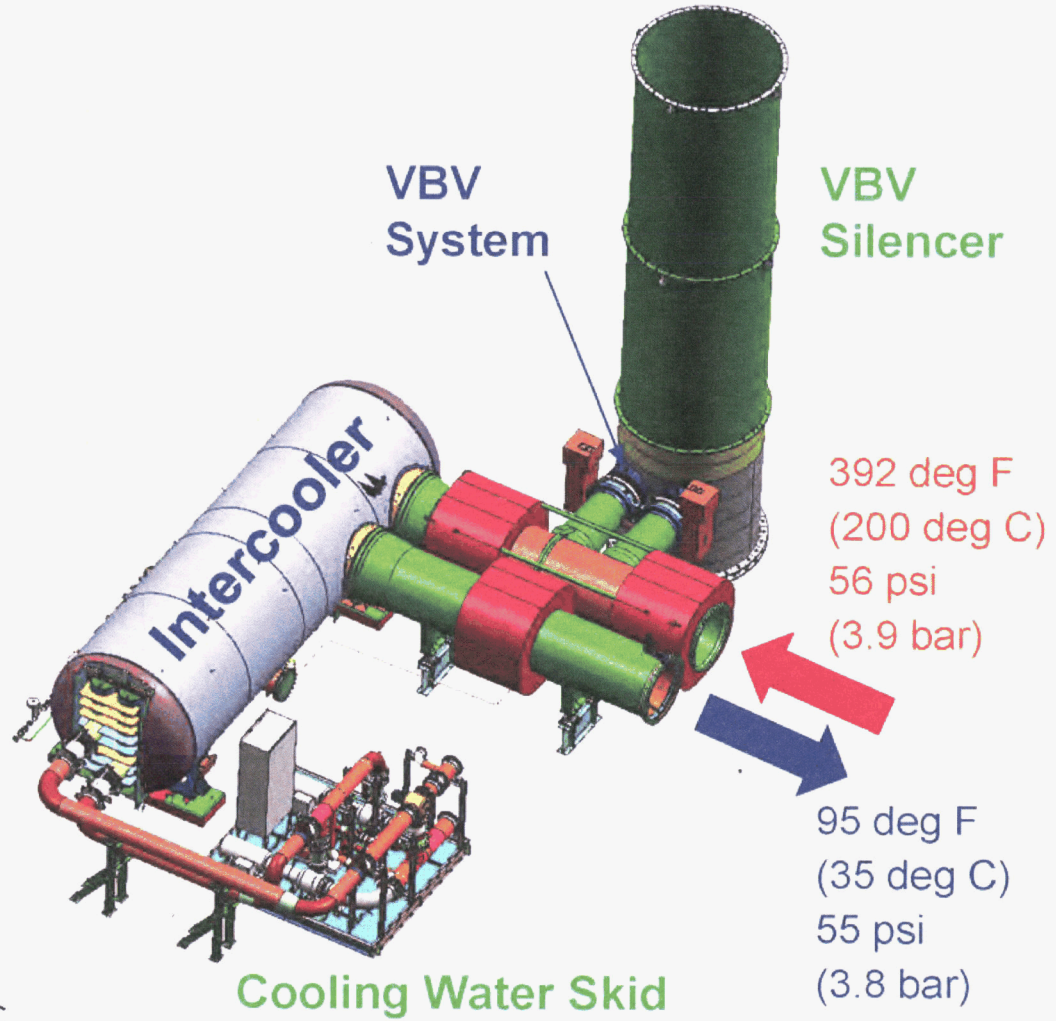
Intercooler Key to LMS 100 Performance

Enables high mass flow, high pressure ratio and hot-day power retention

Standard intercooler

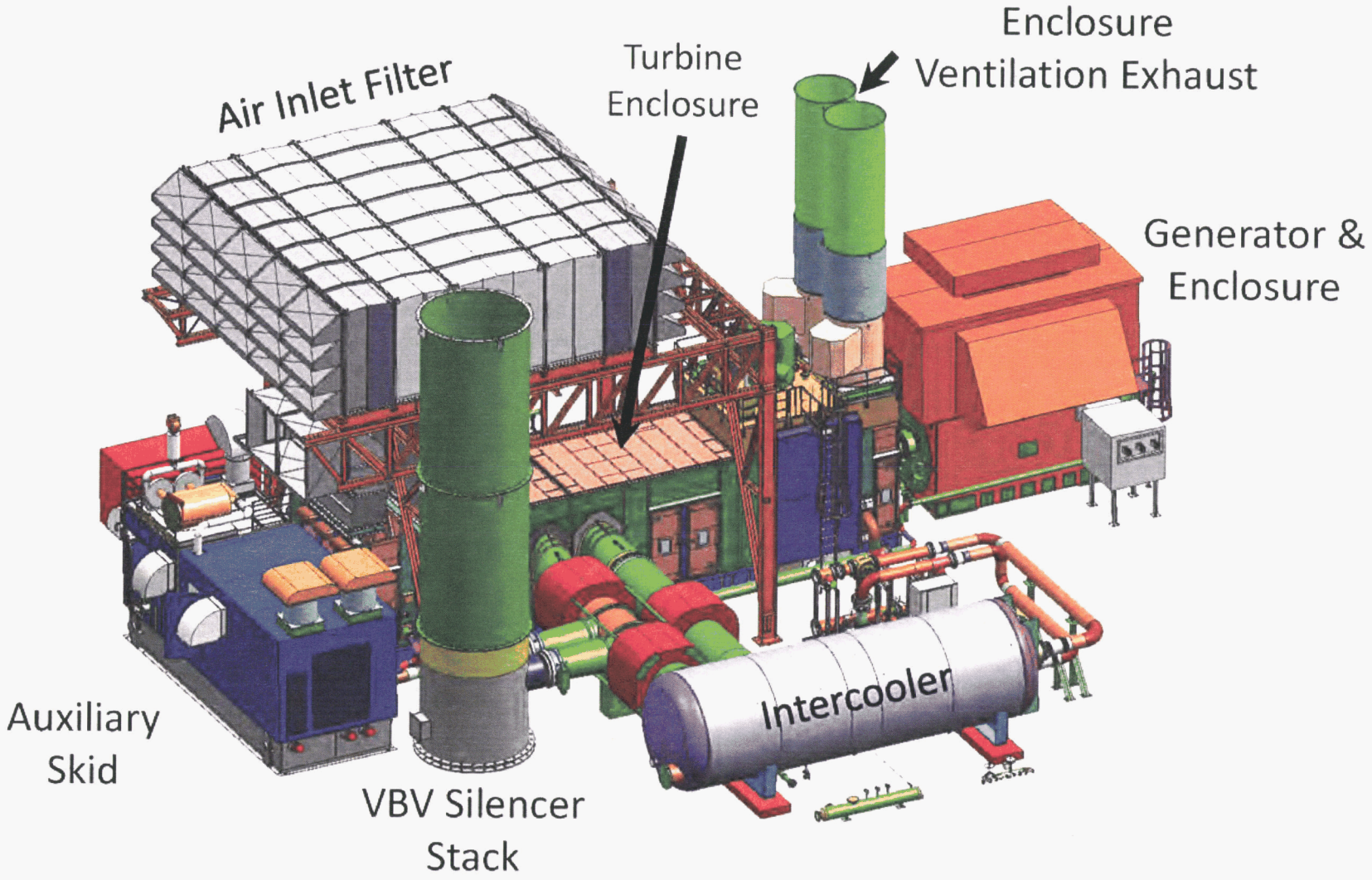


Meets ASME & PED requirements



Information Provided by General Electric

LMS 100 Key Components



Information Provided by General Electric

Public Involvement Opportunities

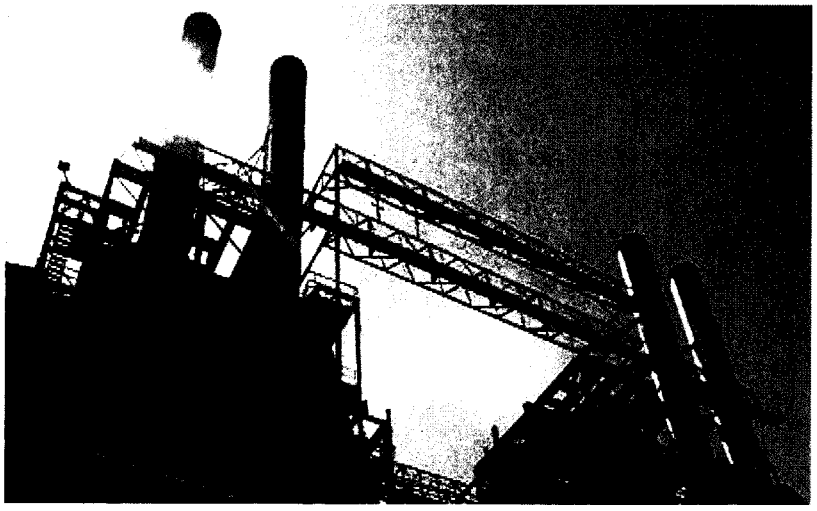
- Share your comments tonight
- Visit the Project Website azenergyfuture.com/ocotillo
- E-Mail the Project Team at OcotilloGenProj@aps.com

Scan with your smartphone for quick access to the website

aps

APPENDIX J-6 – PROJECT WEBSITE

OCOTILLO MODERNIZATION



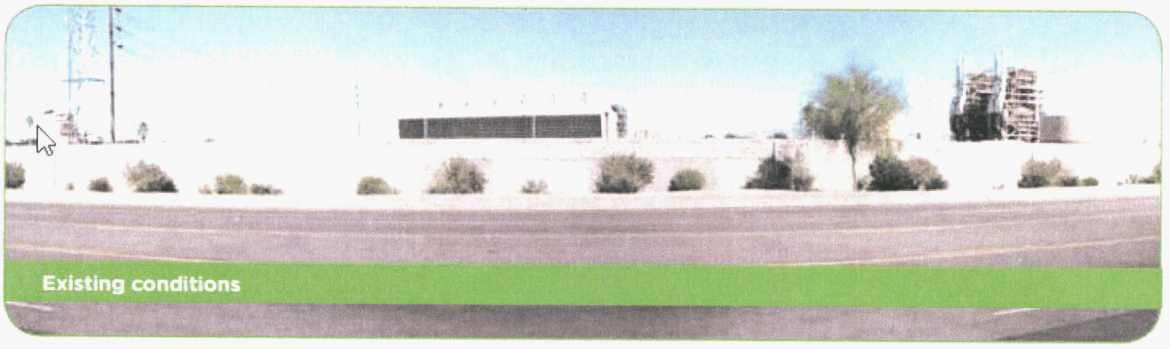
APS is planning to modernize the Ocotillo Power Plant in Tempe. The proposed project will create a cleaner-running, more efficient plant using advanced technology. APS intends to install five combustion turbines powered by natural gas. Two existing 1960s-era units will be removed.

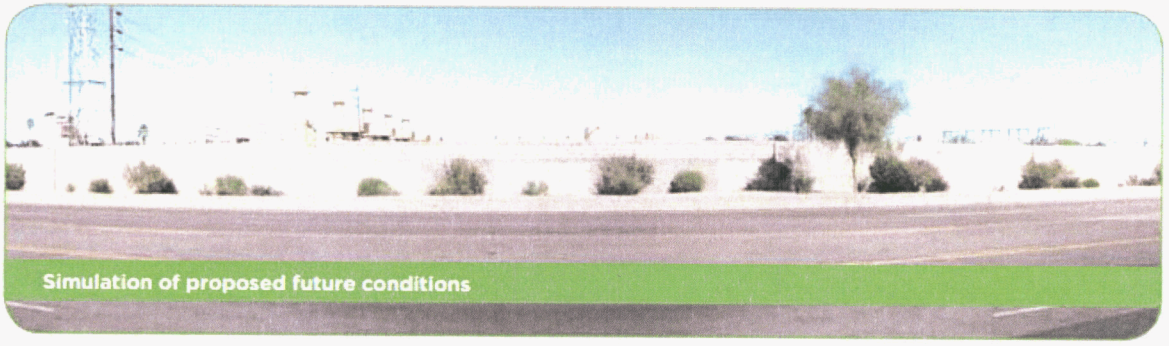
The project is critical to the Phoenix metro area and provides several benefits. It supports service reliability, improves the plant's appearance, is better for the environment, creates construction jobs and adds additional tax revenue to the local economy.

We welcome feedback from the public about the project. Please complete the form below to share your comments or be added to the mailing list.

You also can learn more about the project during an open house on Tuesday, April 22.

Ocotillo Modernization Snapshot





* *View from University Drive looking north*

Get Involved

First Name: Last

Company/Organization:

Email:

Address:

City: State:

Comment:

Note: Please do not include any personal information in the comment text because th

- (•) Please add me to the electronic mailing list
- ( ) Please add me to the postal mailing list
- ( ) Please do not add me to the mailing list

Submit

FAQs

What is the project timeline?

APS plans to file applications for project permits this spring and summer. Construction on the new units, if approved, would begin in 2016 and be completed in 2018. Removal of the old units would begin in 2018.

Why upgrade the Ocotillo plant?

The Ocotillo plant is critical to maintain service reliability in the Phoenix metro area because of its location. We can also improve an existing plant without changing its overall footprint and replace generators that are increasingly costly to operate and maintain. Many replacement parts

are no longer available for the steam generators and must be custom-made to keep equipment running.

What will be the environmental benefits?

Replacing the obsolete steam generators with much newer, proven, cleaner technology will greatly improve the plant's efficiency. The new units will decrease the plant's water-use and emission rates. They will also improve the plant's overall noise conditions.

How tall will the new structures be?

The plant currently has four 178-foot stacks, while the upgraded plant is planned to have five stacks about half as tall. This would significantly reduce the plant's visibility from several locations.

What economic benefits will the project provide?

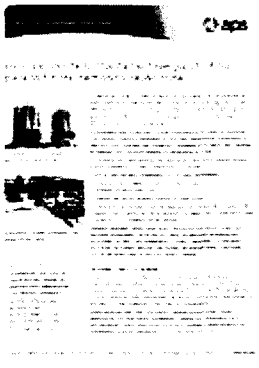
It will create local jobs – we expect the project to require an average of 114 jobs during construction. Total property taxes for the upgraded plant are expected to increase to about $8 million by the fifth year of operation. APS currently pays about $600,000 in total property taxes for Ocotillo.

How can I get involved in the project?

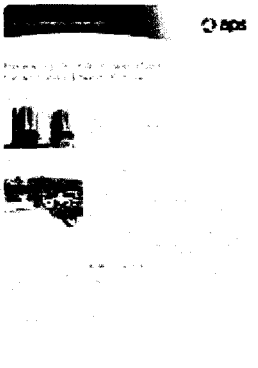
APS is committed to a transparent public process. The public can submit comments on the project through the form above. In addition, we will hold at least two public open houses to provide information and take comment.

View more FAQs about the Ocotillo modernization project.

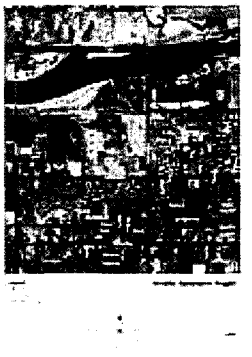
Downloads



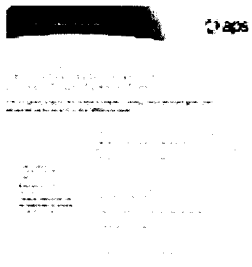
Ocotillo Boletín Informativo - Abril 2014



Ocotillo Newsletter - April 2014

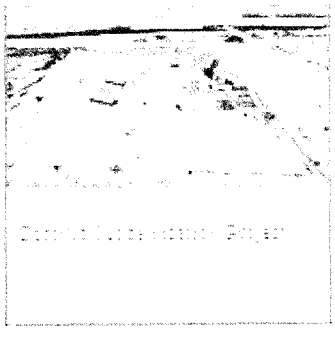


Ocotillo Project Site Renderings



Ocotillo Project Fact Sheet

Videos



Blog

Ocotillo Public Information Open House

Ocotillo Open House Tuesday, April 22, 2014 5:00 - 8:00 p.m. ASU Karsten Golf Course Clubhouse 1125 East Rio Salado Parkway Tempe, AZ 85281 APS plans to modernize our

Ocotillo Power Plant, located at University and McClintock in Tempe. We intend to invest up to $700 million in the aging plant today so we can ...

APRIL 08, 2014 READ MORE

Arizona Republic Highlights Benefits of Ocotillo Power Plant Modernization

On Saturday, the Arizona Republic covered APS's plan to modernize the Ocotillo Power Plant: The half-century-old natural-gas plant towering over Tempe east of Arizona State University will be demolished to make way for more powerful, compact and efficient generators, utility officials said. ...

FEBRUARY 17, 2014 READ MORE

Comment submissions received

Project Comments

Database ID	Date	Submission Text
8	02/15/2014	It is sad to see the old plant torn down as we were the operators that put in online many years ago. Time to make room for the new generation of power.
11	02/27/2014	Do you every have tours of the facility? I have a business across the street, and for 37 years have wondered what it looks like up close. Thank you, Bob Jones
12	02/27/2014	I am the General Manager for Gateway at Tempe apartments, directly across the street from this plant. Can you please keep me up to date on progress and timeline as I can see construction having a dramatic impact on my residents? Thank you.
13	02/27/2014	My landlord purchases power from SRP
17	02/27/2014	The plant looks great. Excited to see it built. One issue with the webpage though. The text is very difficult to read. It needs to be a bolder font type.
59	02/27/2014	I am a business owner currently in the middle of lease negotiations with 2 properties directly across from the Ocotillo Power Plant. I would like to know how this will affect the businesses in the area. A 2 year project could potentially have detrimental effects on a business located directly across the street during construction time in terms of noise, traffic, and other unforeseen issues etc.
19	02/28/2014	As an APS customer in another area, and as a resident of Tempe, I am appreciative of APS's efforts to modernize this plant.
60	03/03/2014	I have been waiting for this for 20 years. It is long overdue! If this project has to go thru a full blown public input and permit process I will attend it and I am fully prepared to speak in favor of project. If I am a political activist it is only because I have a fundamental understanding of the science and economics of energy generation and as well as it's efficient use, a retired Mechanical Engineer.
33	03/18/2014	Hi I am interested in this project both from the point of view of a resident of AZ as well as a business partner working with APS at the HQ level with APS Power Plants. Kindly include me in your electronic mailings.
35	04/10/2014	I live nearby and could hear the steam from the old generators in the early morning. Even though I am an SRP customer it is great that you are becoming more energy efficient. I don't understand why this is starting 2 years from now. You ask for rate hikes that get heard in less than a year why can't you start moving forward with this a lot sooner. Who can be opposed to saving water, getting rid of old blight and being more energy efficient?
38	04/11/2014	This sounds great.
39	04/14/2014	I'm all for renewing the Ocotillo power plant to protect our air quality

40	04/17/2014	I am definitely for the modernizing of Ocotillo. Good luck.
42	04/18/2014	That is good project. I like it.
58	04/18/2014	Tom: I was able to locate this site and am impressed with what you're going to do with Ocotillo. I hope you can maintain as many employees that are necessary. Also, I've just returned from a trip to New Mexico and you should see the looks I received with my 'Ocotillo Hat' ....people even in Springerville and Heber gave me some looks. Thank You for that hat!! Best Wishes to you and all the guys / gals working at one of the major, FINE facilities in the entire system!!
51	06/08/2014	Is there a space for people to learn more about the new technology that is proposed to be implemented in the new turbine systems? I am particularly interested in learning about the safety systems, such as ROSOVs and water monitors if they are to be included in the project. Thank you.

Mailing Information

Database ID	Date	Submission Text
15	02/27/2014	Please remove me from Postal Mailing list
20	02/28/2014	Please change the address above to our email address and take us off the postal mailing. Thanks
21	02/28/2014	Remove from mailing lists.
23	02/28/2014	I receive too many s-mails.
24	03/01/2014	Please send updates via email only. Thank you.
25	03/01/2014	We would like to opt out of any future mailings. Thank you.
26	03/03/2014	Please remove my address from mailing list. Thanks
27	03/04/2014	I am no longer living in the area
28	03/04/2014	We no longer live at this address.
29	03/04/2014	Hello! Please remove me from the "snail mail" list; I prefer to receive all future communication and updates exclusively via e-mail. Thank you!
30	03/05/2014	Please remove me from all future mailings. Thanks.
50	06/05/2014	Hello, I would like to opt-out of mailings from your firm. I am receiving mail addressed to: Daniel C/Kokins Janina B Hanecke, thank you

Vendors

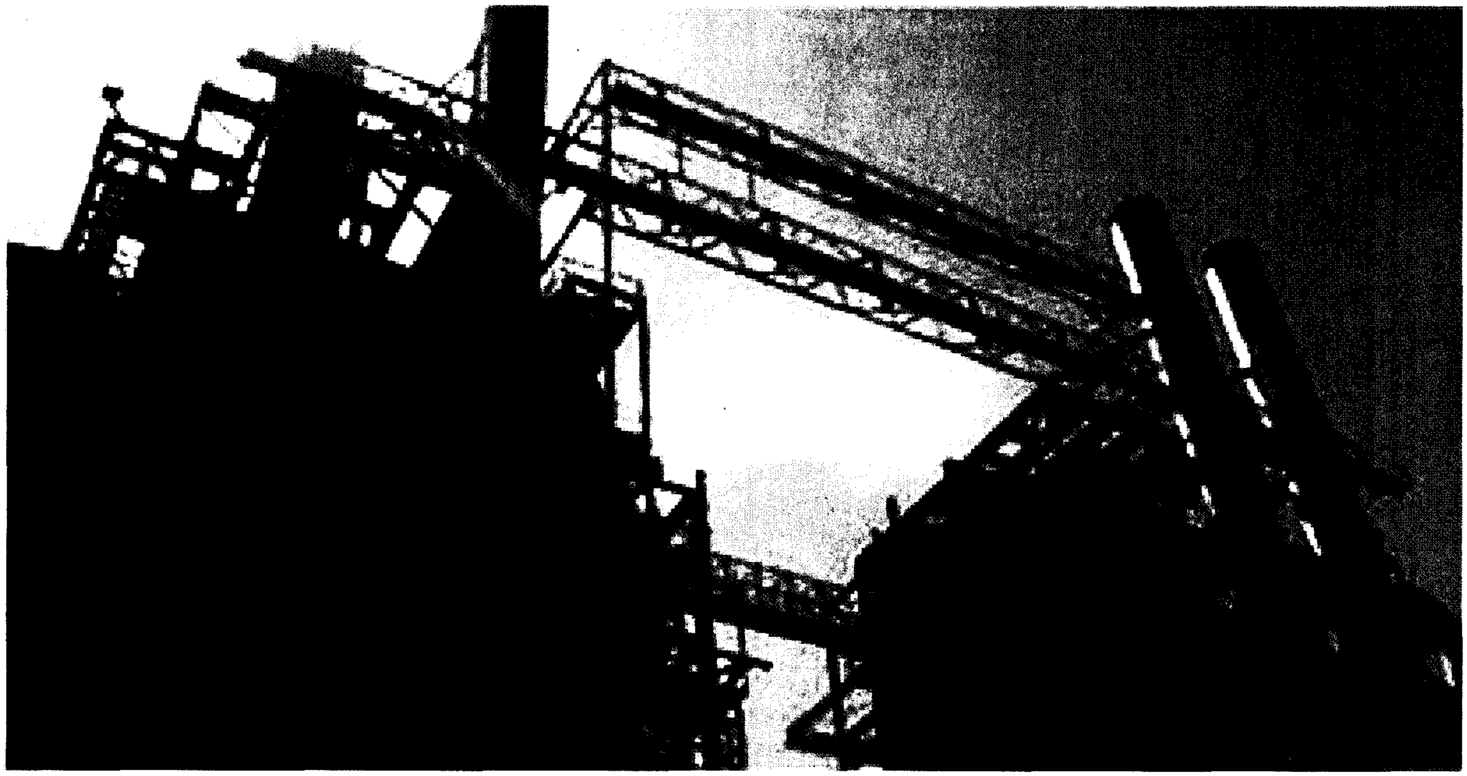
Database ID	Date	Submission Text
10	02/27/2014	Dear Sirs, Please, I want to have more information about this Project because I can support with the supply of High Voltage Equipment. I would like to understand better how will be the Purchase process. Please, let me know when you will start the purchases and if the power transformers will be bought separately by APS. Thank you and regards.
14	02/27/2014	Looking to help with transformer needs. New/disposal/repair in field. Any Pipe concerns structural, water, gas, steam along with fittings & valves. Thank you for the opportunity to earn your business.
16	02/27/2014	Any project we can help you with let us know
18	02/28/2014	To whom it may concern: Copper State Bolt & Nut Co. is very interested to take any part possible in the future of APS Ocotillo as we look forward to continuing the long running relationship between APS and CSBN. We ask that we be included on any fastener, tooling, safety, solution requests. Thank you in advance for your time and consideration.
22	02/28/2014	Hello. Who will be doing the design work and when will the job be put out to bid?? Have a safe day. Thank you, Erik R.
31	03/06/2014	I would like information on the bidding of portable toilets hand wash stations and portable holding tanks for this project. Thank you

32	03/10/2014	We are industrial insulation and scaffold contractors with a location in Mesa. How can we be placed on the bid post or contractors list for this project?
34	03/24/2014	Eco 3d specializes in 3d laser scanning to capture the existing conditions. Experience in complex industrial environments. Have dimensions and a model where you can fabricate to.
36	04/11/2014	Hello I would like to get information on the bidding process and the dates bids are due. Thank you
37	04/11/2014	Hello I would like to get information on the bidding process and the dates bids are due. Thank you
41	04/17/2014	I'd like to be included on the sale of the 2 turbines you plan on removing. Do you have a company to liquidate these 2 units yet? Please let me know if I can assist. Take a look at our web site. www.sbmac.com for more information about our company.
43	04/23/2014	Boilermakers Local 627 is very interested in assisting with the construction and demolition at Ocotillo Power Plant. Last night informational meeting at Karson Golf Course was good. We will let contractors know so they can be in contact with Aps about this work. Thank You for answering our questions yesterday.
44	05/05/2014	Interest: Demo and construction timing and General Contractor for project. I am a Project Coordinator in Process Control and instrumentation.
45	05/17/2014	Would like to know more about the project and any EPC you might select.
46	05/19/2014	We are a one stop shop service from demo, ASME code welding services, rigging and transportation. Please visit us at www.contractorscargo.com
47	05/30/2014	Isolux Corsan is a contractor and wished to be kept informed about the project.
48	05/30/2014	Thank you.
49	06/05/2014	Fluor is very excited about this most exciting project and would like to be a part of the team that helps take Ocotillo to the next step. Fluor believes that it is well positioned to assist in this modernization project based on our extensive past experience in meeting current environmental regulations.
52	06/23/2014	We would like more information on the opportunity to bid this project. Please advise. Thank you.

APPENDIX J-7 – SOCIAL MEDIA

Arizona Public Service - APS shared a link.

APS plans to modernize the Tempe Ocotillo Power Plant--a familiar sight on the East Valley horizon. The project will support service reliability, improve the plant's appearance, provide environmental benefits, create construction jobs and increase local tax revenue.



Ocotillo Modernization - Arizona's Energy Future - APS
www.azenergyfuture.com

APS is planning to modernize the Ocotillo Power Plant in Tempe. The proposed project will create a cleaner-running, more efficient plant using advanced technology. APS intends to install five combustion turbines powered by natural gas. Two existing 1960s-era units will...

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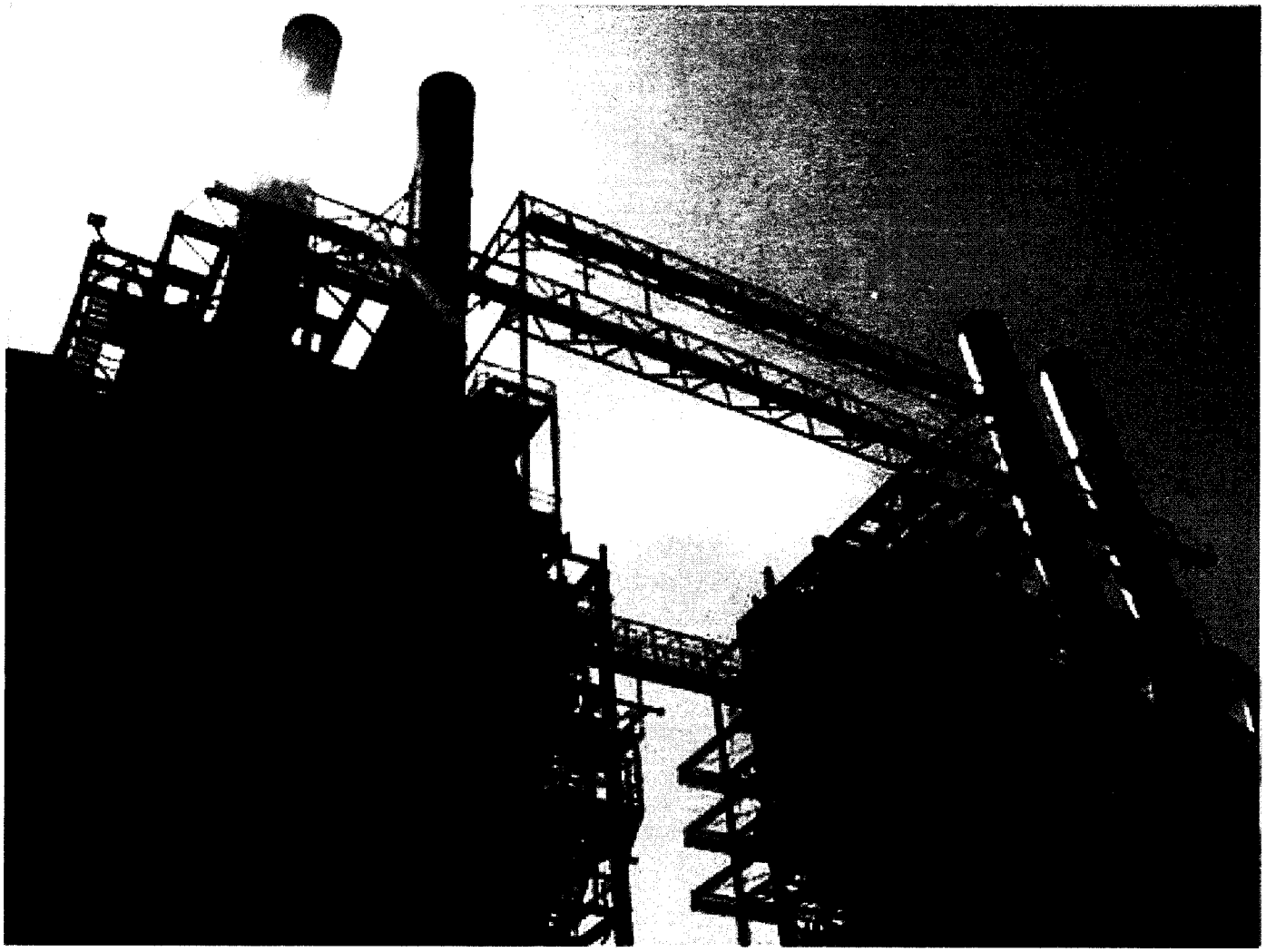
34 1

625 people saw this post

Boost Post

APS @aps_AZ · Feb 17

APS plans modernization of Tempe Ocotillo power plant—improved views, environmental benefits. bit.ly/1cQQof1 pic.twitter.com/Jvp1q5EzPF



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12:40 PM - 17 Feb 2014 · Details

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Arizona Public Service - APS

Sponsored

Learn about plans for Ocotillo at open house Tue. 4/22 5-8pm at ASU Karsten Golf Course.

Ocotillo Modernization

APS plans to modernize the Ocotillo Power Plant in Tempe. The project will improve views, provide environmental benefits, enhance reliability, create...

Learn More

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APS (apsFYI) on Twitter

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1,131	123	2,453	6,907	154	More ▾

Follow

Take shade tree workshop online, pick up free trees 4/26 #Grayhawklynx in #Scottsdale: bit.ly/aps-trees (Maricopa Co customers only)

2 1

APS @apsFYI Apr 21

Learn about plans to modernize Ocotillo Power Plant at open house Tue. 4/22 5-8pm at ASU Karsten Golf Course: bit.ly/aps-oco #Tempe

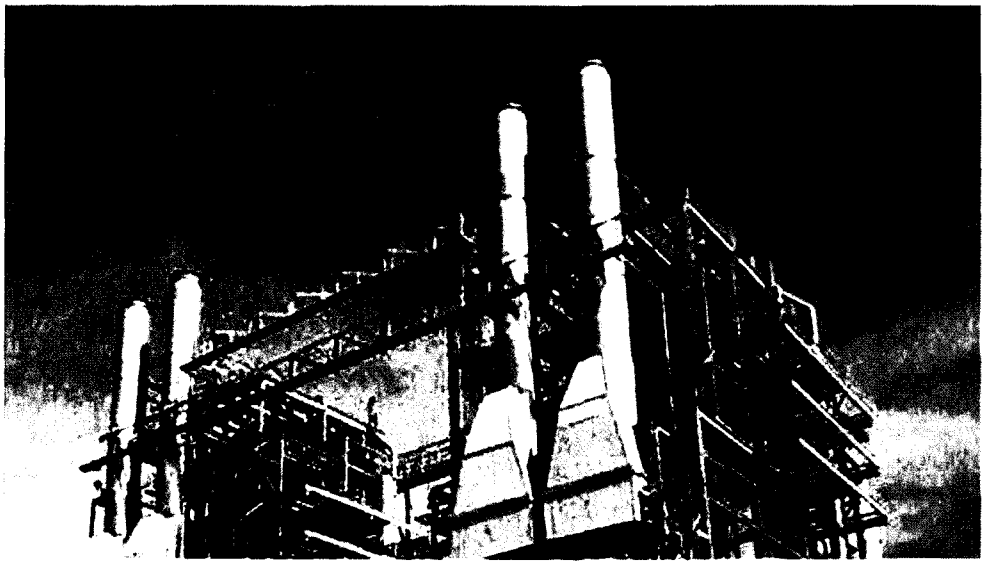
1

APS @apsFYI Apr 20

Visit us #KPB_AZ #EarthDay Tue. 4/22 for free CFL & chance to enter #APSEnergyAllStar contest (APS customers only) earthdayphoenix.org

APPENDIX J-8 – NEWSPAPER ARTICLES

APS natural-gas plant in Tempe to be demolished



By Ryan Randazzo and Dianna M. Náñez The Republic | azcentral.com Fri Feb 14, 2014 11:41 PM

The half-century-old natural-gas plant towering over Tempe east of Arizona State University will be demolished to make way for more powerful, compact and efficient generators, utility officials said.

Arizona Public Service Co. plans to spend $600 million to $700 million dismantling the two steam generators at its Ocotillo Power Plant and replacing them with five shorter generators that use less water and fuel to make electricity. The company hopes to complete the project in 2018.

The two steam-driven generators provided nearly one-third of the electricity for APS during hours of peak demand when they opened in 1960. They now provide a fraction of the company's supply as the metro area has grown.

"We have sort of a love story with Ocotillo," said Pat Dinkel, APS vice president of resource management. "They served Arizona through a phenomenal growth period. These units were built before we built coal and nuclear and other units. This was the cornerstone of building Arizona for the last 50 years."

APS plans to begin seeking permits for the project next month, Dinkel said. In addition to OKs from the city and Maricopa County, the project will need approval from the Arizona Corporation Commission and Department of Environmental Quality.

The Ocotillo site, on the northwestern corner of University and McClintock drives, also houses a solar-power plant, switchyard and an area leased for solar testing, all of which will remain amid the upgrades.

The tall generators will be removed after the new ones come online in 2018. The old generators can burn oil or natural gas, although APS almost never uses oil anymore because of the emissions.

APS will maintain two smaller "simple-cycle" generators at Ocotillo that were built in the 1970s and add five larger ones. Simple-cycle gas plants burn natural gas and force hot air through a turbine to make electricity, somewhat akin to giant jet engines.

The new units use a fraction of the water required to make electricity with the steam generators, Dinkel said.

The new units not only will generate more electricity, which APS needs to replace expiring contracts to buy power from other utilities, but also will allow the company to respond faster to increases in power demand.

The two older units run about 10 percent of the year. They are troublesome because replacement parts are difficult to find, and the units take six hours or more to start up. That means APS must fire up the generators at 2 a.m. in the winter to meet peak electricity demand at 8 a.m. on cold mornings. They have to start before noon in the summer to meet peak demand at dusk.

The new units will be able start up in about 51/2 minutes and be at full power in 10 minutes.

That is important not only to respond when other power plants experience interruptions, but also to match the variable output of solar and other renewable-energy sources being placed on the grid.

APS officials said that they have examined other proposals to meet the company's increasing power demands and that

Salt River Project faced a similar situation in the early 2000s when it negotiated to expand the Santan Generating Station in Gilbert.

Nearby residents bitterly fought SRP's $500 million plan to increase the capacity of the plant from 300 megawatts to more than 1,000. The Ocotillo expansion is smaller and, unlike Santan, will make the plant less visible once complete.

Both projects, however, involve weighing the benefits of building power plants near the people who use them or building them in rural areas with miles of transmission lines and substations to get the power to the city.

Building power plants in or near the metro area also avoids the electricity that is lost in long transmission lines.

Increasing power demand

APS generally relies on power plants outside metro Phoenix, but utility officials said the power grid is much more reliable with some generation inside the urban area that they own and can control without calling upon merchant power plants to purchase electricity when they need it most.

"We need some (generation) close to where people consume power," Dinkel said. "Ocotillo is the only generation we have on the east side of the Valley. We've studied this with the SRP system. We are joined at the hip with them."

APS is not seeing customer demand grow as fast as during the early 2000s, but it also must replace some contracts for power from other utilities that expire in coming years.

The Ocotillo addition will not be as visible as the current structure, but the newer generators won't be much quieter than the existing facility, Dinkel said. People nearby may hear them less because they will be to the west of the property, farther from the property boundary than the current generators, he said.

APS officials said they have talked with ASU and city officials and soon will begin notifying the public about their plans.

"The city of Tempe is excited about this, as they should be, with the increased construction jobs there," Dinkel said.

Tempe Councilman Kolby Granville, who was recently briefed on the project, said he will reserve final judgment on the new plant until he sees the completed plans. But he sees few drawbacks to the early proposal.

"My understanding is it's more power with less pollution and smaller stacks that look less ugly. I really don't see any downside," he said.

Though Gilbert residents fought SRP's Santan project, Granville believes the Tempe plant will be embraced because it is expected to be less of an eyesore.

"My hunch is this is going to go as smooth as these things can," he said. "The thing that they're removing looks like something out of a post-apocalyptic 'Mad Max' movie. And the thing that they are adding looks like a modern power plant."

Granville does not believe APS will garner any city incentives for the project.

The completed plant is expected to generate increased property taxes for the city and state because of higher valuation.

The Ocotillo plant pays about $600,000 in property taxes annually, which will increase to $8 million after five years, raising revenue for the city and state, according to APS.

But Granville said revenue is not the only factor the council considers when deciding whether to support projects that will drastically change the face of the city.

"You weigh impact on the surrounding community," he said. "You weigh impact to the city in the way of increased revenue and the quality of life. ... Those are all things that are not 12 months of construction jobs. Those are things that affect people for 30, 50 years into the future."

Community outreach will be a critical component to gaining the public's trust and support, he said.

Natural gas a key fuel

While APS is continuing to add solar power and other renewable energy to its supply, natural gas will remain an important power source, Dinkel said.

"We have a better balanced portfolio than most utilities with nuclear, gas, coal, renewables and energy efficiency," Dinkel said. "Balance comes at a price. You are never optimal for one resource at a moment. You manage your risk over time."

Tim James, a senior sustainability scientist at the ASU School of Sustainability and a professor at ASU's W.P. Carey School of Business, said that APS, SRP and other utilities are turning to natural gas because it is safe.

"It's just cheaper, basically," he said. "There is not much regulatory risk with natural gas."

The cost is important because any expense the utility experiences is passed on to customers through their electric bills.

James compared building gas plants to the controversy over the Navajo Generating Station, a coal-fired plant near Page, which is facing more than $1 billion in upgrades to comply with U.S. Environmental Protection Agency anti-pollution requirements. Natural-gas plants are nowhere near as risky, James said.

"It just makes the most sense," he said.

Utilities can continue to add renewable power such as solar, but solar still has the major shortcoming of not being able to store electricity for use when the sun goes down, James said. Solar-thermal power plants such as the Solana Generating Station near Gila Bend, which produces power after dark by storing heat in molten salt, are too expensive to rely on for all of APS' energy, he said.

"Solana is a clever facility but more expensive than traditional methods of generation would be," he said.

He acknowledged that residents complained about the expansion of the Santan plant.

"But you don't hear anything about it now, do you?" he said. "There are tons of (gas plants) all over the Valley."

APS has another gas plant in the West Valley, and SRP has another in Tempe.

Dinkel said APS continues to monitor concerns over natural-gas production and the controversy over hydraulic fracturing, or fracking, the intentional breaking up of the rock around gas wells to produce more fuel.

"There is risk with every single technology," Dinkel said. "There is no purely, totally safe technology. Clean-coal technologies are not ready. We don't want to be building new coal. Nuclear is not ready. We are not ready to build new nuclear from a cost perspective and permitting. Solar is important to our portfolio but can't do everything. Gas has to be the filler right now."

Even if natural-gas prices have shown short-term volatility, projections are for the fuel to see stable prices in the long term, he said. APS also has a fuel-hedging program to limit the company's exposure to price fluctuations.

"There is no economic way of working around gas anytime soon," he said.

APS demolerá planta de gas en Tempe

por Ryan Randazzo y Dianna M. Náñez
The Arizona Republic/www.azcentral.com

Con medio siglo de existencia, la planta de gas natural que se observa al costado este de la Universidad Estatal de Arizona, en Tempe, será demolida para dar paso a la construcción de los generadores más potentes, compactos y eficientes que existen, así lo declararon funcionarios de APS.

Arizona Public Service Co., conocida por sus siglas en inglés como APS, invertirá entre 600 y 700 millones de dólares para desmantelar dos generadores de vapor ubicados en su estación de Ocotillo, mismos que serán reemplazados con cinco generadores de menor tamaño que producirán electricidad utilizando menos agua y combustible. La compañía espera finalizar el proyecto en el año 2018.

Cuando APS abrió sus puertas en 1960, ambos generadores de vapor abastecían un tercio de la electricidad durante las horas de máxima demanda; en la actualidad, con el crecimiento del área metropolitana se proporciona sólo un cuarto de la solicitud.

Pat Dinkel, vicepresidente de gestión de recursos de APS, menciona el aprecio que su compañía tiene por Ocotillo es una especie de amor pues "fuimos testigos y somos parte de un extraordinario crecimiento en Arizona; levantamos las unidades que trabajaron con carbón y también con energía nuclear. Esta planta significa parte de la construcción del estado durante los últimos 50 años".

Durante el mes de marzo APS comenzará la licitación para obtener los respectivos permisos de construcción que se requieren por parte de la ciudad y el condado Maricopa, además de que necesitarán la aprobación de la Comisión de Corporaciones de Arizona y el Departamento de Medio Ambiente.

La planta Ocotillo, ubicada en la esquina noroeste de la Universidad Estatal de Arizona y la Avenida McClintock, cuenta con una planta de energía solar, patio de pruebas y una zona de maniobras, las cuales permanecerán hasta que las nuevas estén completamente finalizadas.

La planta Ocotillo, ubicada en la esquina noroeste de la Universidad Estatal de Arizona y la Avenida McClintock, cuenta con una planta de energía solar, patio de pruebas y una zona de maniobras. TOM TINGLE/THE REPUBLIC

Los generadores de alto voltaje serán demolidos después de que los nuevos estén activos en el año 2018. Los actuales pueden quemar petróleo o gas natural, sin embargo APS casi nunca utiliza el aceite debido a las normas ambientales.

APS mantendrá dos generadores más pequeños construidos en 1970 y se sumarán cinco más grandes que queman gas natural y envían el aire caliente a través de una turbina para producir electricidad, algo parecido a los motores de los grandes jets.

Kindel aseguró que las nuevas unidades utilizan sólo una fracción del agua que se requiere para producir electricidad con los generadores de vapor actuales. Las nuevas unidades permitirán generar más electricidad y responder más rápido a los aumentos de la demanda de energía por parte de los usuarios y servicios públicos.

Las dos unidades más antiguas sólo producen 10% del total que se utiliza al año; en caso de reparación, las piezas de repuesto son difíciles de encontrar y las unidades toman seis horas o más en arrancar. Eso significa que APS debe encender los generadores a las 2a.m. durante el invierno para cubrir la demanda extrema de electricidad que se presenta a las 8a.m. en las conocidas "mañanas frías", y en el verano tienen que comenzar antes del mediodía para satisfacer la demanda en la oscuridad.

Con las nuevas unidades, la energía será capaz de poner en marcha el proceso de abastecimiento en cinco minutos y estar lista (10 minutos) a plena potencia.

Esto es importante no sólo para responder cuando otras plantas de energía experimentan interrupciones, sino también para que coincida con las nuevas tecnologías de energía solar renovable y otras más que están por salir.

Funcionarios de APS dijeron que han examinado otras propuestas para hacer frente a la creciente demanda de energía, y decidieron que el aumento de la capacidad en Ocotillo es la mejor opción.

Demanda de energía

Por lo general APS ha construido sus plantas de energía afuera del área metropolitana de Phoenix, sin embargo los funcionarios encargados de los servicios públicos mencionan que la red de energía es mucho más confiable si un poco de la generación se realiza en la zona urbana y puede controlarse sin recurrir a las plantas de energía comercial en donde se compra la electricidad cuando más consumo se requiere.

"Necesitamos un poco de energía (generación) cercana al lugar donde la gente está consumiendo", asegura Dinkel. "Ocotillo es la única planta que tenemos en el lado este del valle; lo anterior lo hemos analizado en conjunto con SRP, y sin duda estamos unidos con ellos en alguna parte del proceso".

APS indica que no está viendo que la demanda del cliente crezca tan rápido como en el año 2000, sin embargo busca adelantarse y reemplazar algunos contratos para la generación de otros servicios públicos que están por vencer en los próximos años.

"La nueva construcción en Ocotillo no será tan visible como la estructura actual, y sin dejar de ser igual de ruidosos que los generadores actuales, los nuevos no molestaran a los residentes pues la estructura estará ubicada al oeste de la propiedad", indica Dinkel.

Los representantes de APS ya han hablado con funcionarios de la Universidad y de la ciudad, respectivamente, y pronto se iniciará una notificación pública para dar a conocer sus planes.

Dinkel indicó que la ciudad de Tempe ha manifestado su entusiasmo ya que con la construcción se generarán más empleos.

Sin embargo, para el Concejal Kolby Granville, de Tempe, el proyecto es de pronóstico reservado y decidió emitir sus comentarios hasta ver los planes finalizados pues tiene algunos inconvenientes con la propuesta inicial ya que brinda la idea de "más potencia y menos contaminación, algo así como baterías más pequeñas para que se vean menos feo".

Gas natural: combustible clave

En tanto APS continúa incorporando nuevas técnicas de energía solar y energía renovable, el suministro de gas natural continúa siendo una fuente importante, asegura Dinkel.

"Tenemos una cartera de recursos muy equilibrada con abasto de energía nuclear, gas, carbón, energías renovables y eficiencia. Balanceamos el precio y administramos nuestros riesgos a través del tiempo".

Tim James, destacado científico especialista en sustentabilidad y académico de la escuela de negocios de la Universidad Estatal de Arizona, menciona que "APS, SRP y otros servicios públicos están recurriendo al gas natural pues es más seguro y barato, básicamente. No hay mucho riesgo con el gas natural".

James comparó la controversia creada por la construcción de la planta generadora de gas "Navajo", una planta de carbón que se enfrenta a más de mil millones de dólares en mejoras para cumplir con las exigencias anticontaminación de la Agencia de Protección Ambiental de Estados Unidos. "Las plantas de gas natural son menos riesgosas y sencillamente tienen más sentido", dijo.

APS to renovate Ocotillo plant in Tempe

Photo courtesy of APS

Posted: Tuesday, February 25, 2014 7:53 am | *Updated: 8:05 am, Tue Feb 25, 2014.*

By **Eric Mungenast**, Tribune

An upcoming update of a power plant in Tempe by APS is expected to provide benefits ranging from new construction jobs to an improvement in the neighborhood aesthetics.

The project will modernize the Ocotillo Power Plant by removing two power units built in the 1960s and replacing them with five modern units, as well as the removal of three oil storage tanks on the property.

Information sent by APS states the project will cost $700 million to complete and will require the addition of more than 100 construction positions. The project is expected to last for two years, with a completion date set for 2018.

Ocotillo power plant

APS will revamp its power plant in Tempe to create a more efficient facility. The project includes the removal of two turbines built in the 1960s.

Once completed, APS estimates Ocotillo's megawatt capacity to increase from 330 to 620, which also increases the number of homes it can serve from 83,000 to 165,000. The company does expect the current noise level to remain the same.

Expectations also include an increase in property tax revenue for Tempe, Maricopa County and the state from $600,000 to $8 million by 2023.

APS Director of Resource Planning Jim Wilde said the need to replace the two older units, which will continue to run until the project's completion, stems from the age of the current models; he said it's becoming more difficult to maintain them because they are in the neighborhood of 50 years old. Plus, the current models aren't as efficient as the ones the company intends to replace them with. The new ones will use 85 percent less water than the current ones, and can start up within five minutes; the current models take six hours to get on the electric grid.

Wilde said the benefits extends beyond efficiency and encompass multiple sources of energy as well. He said the company already incorporates multiple forms of energy – he cited solar in particular – but the revamped Ocotillo plant can modernize APS' natural gas facilities.

"You don't want to put all of your eggs in one basket," he said.

For those living in that part of Tempe — near University Drive between McClintock Drive and Rural Road and one mile east of the Arizona State University campus — the completion of the

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For those living in that part of Tempe — near University Drive between McClintock Drive and Rural Road and one mile east of the Arizona State University campus — the completion of the renovation should result in a better connection to the power source, and, most notably, a more sight-friendly area. The latter stems from the size of the units, as the new models are significantly smaller than the ones in place.

"The new units are half as tall as the old units, so the site's footprint will be much, much better from a visual aspect," he said.

Visit http://www.azenergyfuture.com/ocotillo/ for more information about the project.

Arizona Public Service seeks to renovate Tempe plant

By David Hignutt (http://www.statepress.com/author/david-hignutt/)
February 26, 2014 at 7:54 pm

The Tempe skyline will be getting a bit of a facelift, all while improving the city's economy and environmental sustainability as well.

Arizona Public Service has announced it will be renovating its Ocotillo Power Plant, located on University Drive in Tempe, near the ASU Karsten golf course.

APS is the largest energy provider in Arizona as well as the state's largest tax payer. It provides power to Flagstaff, Prescott and Yuma, as well of around two-thirds of the Valley, which it shares with the Salt River Project.

The plan is to remove the larger two of four generating units at Ocotillo, and replace them with five smaller, more efficient, more powerful units. Three large storage tanks that have fallen into disuse since the plant's conversion from oil to natural gas in the 1980s.

APS spokesman Steven Gotfried said the new units are a huge improvement over the others.

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"The new unit are cheaper, more efficient in terms of fuel and water consumption, and they create a better visual," he said.

James Anderson, who teaches in the ASU School for Engineering of Matter, Transport and Energy, said the environmental changes coming with the renovation are good ones.

"In the long term, we need to get away from fossil fuels, including natural gas because of the climate forcing effects of carbon dioxide," he said. "In the shorter term, natural gas is a cleaner fuel that results in lower emission of carbon dioxide per unit energy compared to coal and fuel oil. But as long as there isn't enough solar, wind and other alternative energy sources then this type of natural gas power plant needs to exist and be renovated from time to time."

The initial investment in the new units will serve to help growth in the Valley, Gotfried said. The plant's generating capacity will go from 320 megawatts to 620, allowing the plant to power 165,000 homes compared to the current 83,000.

The five new units combined will use 15 percent less natural gas and 85 percent less water than the two old ones, will be half of the original 178-foot height and will also be quieter than the old plants, Gotfried says.

The renovation will also increase the amount of property tax they pay on the site, increasing it from $600,000 to $8 million by the fifth year of operation, Gotfried said.

Sustainability graduate student Tony Perez said he thinks that the plan is a good investment for the company.

"A lot of older systems need upgrades to be efficient, and it's a lot cheaper to retrofit the old plants than to invest the money elsewhere, like in renewables," he said.

Reach the reporter at dhignutt@asu.edu or follow him on Twitter @davidhignutt

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