Transcript Exhibit(s)

Docket #(s): L-00000V-00-0106-00000

Exhibit # : A7, A8, A9, C1, S1

DRAFT

Cultural Resource Survey for the Proposed Gila Bend Power Project Maricopa County, Arizona

EXHIBIT
A-7
Admitted

prepared for
Malcolm Pirnie,
Gila Bend Power Partners, L.L.C.

for submittal to
Arizona Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission

prepared by
Environmental Planning Group

•

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

•

December 2000

epg inc.
environmental planning group

4350 East Camelback Road, Suite G-200
Phoenix, AZ 85018
Tel: 602-956-4370 Fax: 602-956-4374

TRANSMITTAL FORM

Date: 12/13/00
Your Order No.:
Our Job No.: 1095

To: Arizona State Historic Preservation Office
Arizona State Parks
1300 W. Washington
Phoenix, Arizona 85007

Attention: Mathew Bilsbarrow, Compliance Specialist/Archaeologist

Subject: Cultural Resource Survey for the Proposed Gila Bend Power Project
Maricopa County, Arizona

We are sending you via delivery the following:

One (1) copy of our report entitled *Cultural Resource Survey for the Proposed Gila Bend Power Project, Maricopa County, Arizona.*

No. of copies submitted: 1

Copies to:

EPG, Inc.

By: Glenn P. Darrington, RPA

S:\projects\MalPern\GBPP\Cultural\Culttransmit.doc

DRAFT

CULTURAL RESOURCE SURVEY FOR THE PROPOSED GILA BEND POWER PROJECT MARICOPA COUNTY, ARIZONA

prepared for

Malcolm Pirnie
Gila Bend Power Partners, L.L.C.

for submittal to

Arizona Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission

prepared by

Glenn P. Darrington
Kris Dobschuetz
Environmental Planning Group
4350 E. Camelback, Suite G-200
Phoenix, Arizona 85018

EPG Cultural Resource Services Technical Paper No. 2

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

December 2000

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

ABSTRACT

Project Title: Gila Bend Power Project

Report Title: Cultural Resource Survey for the Proposed Gila Bend Power Project, Maricopa County, Arizona

Report Date: December 2000

Agencies: Arizona Power Plant and Transmission Line Siting Committee of the Arizona Corporation Commission
U.S. Army Corps of Engineers

Permit Number: none required

Project Number: Environmental Planning Group Project Number 1095

Project Description: Gila Bend Power Partners proposes to build and operate the Gila Bend Power Project, an 845 megawatt natural gas-fired, combined cycle power plant. The proposed facility, which will encompass approximately 120 acres, will consist of the power plant and on-site supporting infrastructure, including a control/administration building, water treatment and handling facilities, cooling towers, and a switchyard.

Location and Jurisdiction: The project site is located on privately owned land in west-central Maricopa County within Section 19 of Township 5 South, Range 5 West as depicted on the Smurr 7.5-minute U.S. Geological Survey quadrangle.

Acreage: Approximately 170 acres were intensively surveyed for cultural resources. The area examined included the plant site and a proposed road alignment along the southern edge of Section 19, Township 5 South, Range 5 West.

Personnel and Dates of Fieldwork: Glenn P. Darrington directed the fieldwork and served as principal investigator for the study. He was assisted by crew chief Kris Dobschuetz. The fieldwork was conducted on the 8, 9, and 14 November 2000. A total of six person-days of effort were devoted to the fieldwork.

Register-eligible Properties: No archaeological or historical sites eligible for either the State or National Registers were discovered within the study area.

Register-ineligible Properties: A total of 45 isolated occurrences of archaeological artifacts and one prehistoric archaeological site, AZ Z:1:55 (ASM), were found within the study area. The isolated occurrences consist predominantly of chipped stone artifacts. Site AZ Z:1:55 (ASM) consists of a sparse scatter of lithic debitage covering an area approximately 12 meters by 17 meters.

Recommendations: No significant archaeological or historical properties appear to be threatened by ground-disturbing activities associated with the proposed Gila Bend Power Project. Site AZ Z:1:55 (ASM) consists of a sparse scatter of lithic debitage located on top of desert pavement and it is unlikely that subsurface remains of cultural materials are present. Similar sites located just south of the proposed plant site have been previously studied (Doyel et al. 1996) and this site is not expected to provide any new information. Because our recording of the isolated occurrences and the archaeological site has essentially exhausted their information potential, these cultural remains are not eligible for listing on either the State or National Register of Historic Places.

If any human remains or funerary objects were to be unexpectedly discovered during construction, they should be reported to the director of the Arizona State Museum in accordance with Arizona Revised Statutes §41-465.

CULTURAL RESOURCE SURVEY FOR THE PROPOSED GILA BEND POWER PROJECT, MARICOPA COUNTY, ARIZONA

INTRODUCTION

Gila Bend Power Partners, L.L.C. (GBPP) is proposing to construct and operate the Gila Bend Power Project, an 845 megawatt (MW) natural gas-fired, combined cycle power plant to be located in a recently annexed portion of the town of Gila Bend, in Maricopa County, Arizona (Figure 1). In order to proceed with the project, GBPP has requested the issuance of a Certificate of Environmental Compatibility (CEC) from the Arizona Corporation Commission's (ACC's) Power Plant and Transmission Line Siting Committee (Siting Committee).

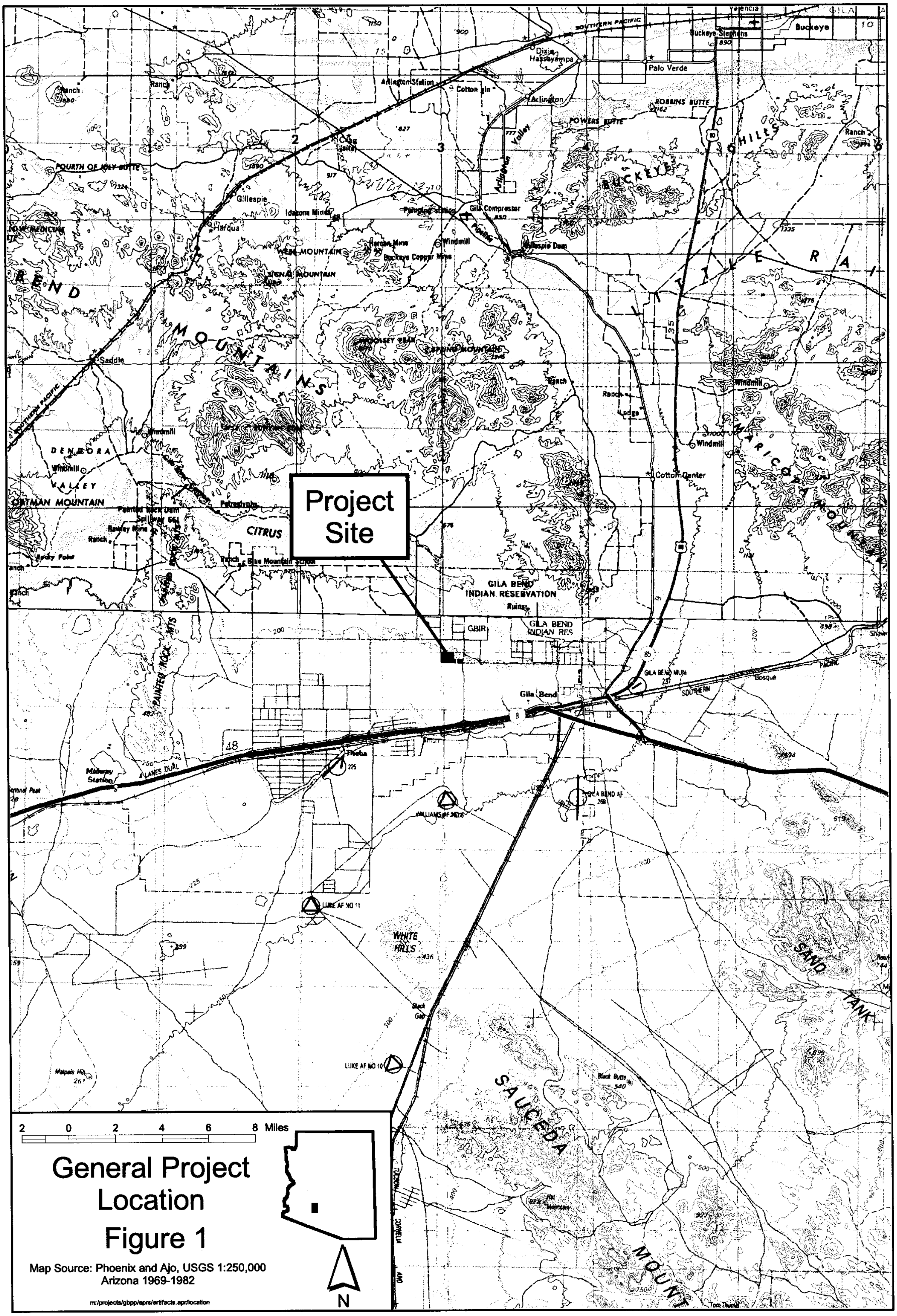
The Arizona State Historic Preservation Act of 1982 stipulates that state agencies, like the ACC, consider impacts of their programs on historical properties in consultation with the State Historic Preservation Office (SHPO). This report is intended to support the ACC's consultation with the SHPO about the proposed Gila Bend Power Project.

This report also has been prepared to support an application for a permit from the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. The information in this report is intended to assist the Corps in complying with Section 106 of the National Historic Preservation Act, which requires federal agencies to consider the impacts of their undertakings (such as issuing Section 404 permits) on properties eligible for the National Register of Historic Places.

Project Description

The proposed Gila Bend Power Project is a natural gas-fired, combined cycle electric generating plant. The project will use three advanced-technology, high-efficiency combustion gas turbines in a combined cycle design producing a nominal 845 MW. The project incorporates the generator sets with three heat recovery steam generators and a single steam turbine generator deriving from a single steam headed manifold from the three heat recovery steam generators. The project design will include power islands, a switchyard, control and administrative buildings, water-cooled condensers with mechanical draft cooling towers, storage tanks, and other ancillary facilities. Access to the project site will be from the east utilizing an access road extending from Watermelon Road at the intersection of Citrus Valley Road.

The Gila Bend Power Project will be fueled by natural gas transported to the plant site by an El Paso Natural Gas Company pipeline. The source of water for the proposed facility will be local groundwater from wells located on property owned by GBPP.



General Project Location

Figure 1

Map Source: Phoenix and Ajo, USGS 1:250,000 Arizona 1969-1982

Project Location

The project site is located entirely on privately owned land in west-central Maricopa County, approximately 6 miles west of the town of Gila Bend. The proposed Gila Bend Power Project is situated just north of Watermelon Road within Section 19 of Township 5 South, Range 5 West as depicted on the Smurr 7.5-minute U.S. Geological Survey (USGS) quadrangle (Figure 2).

Scope of Survey

Approximately 170 acres of privately owned land were intensively surveyed for cultural resources. The area examined included the plant site and a proposed road alignment along the southern edge of Section 19, Township 5 South, Range 5 West. A crew of two archaeologists conducted the intensive pedestrian survey on the 8, 9, and 14 of November 2000, devoting a total of six person-days of effort to the fieldwork. Glenn P. Darrington directed the fieldwork and served as principal investigator for the study. He was assisted by crew chief Kris Dobschuetz.

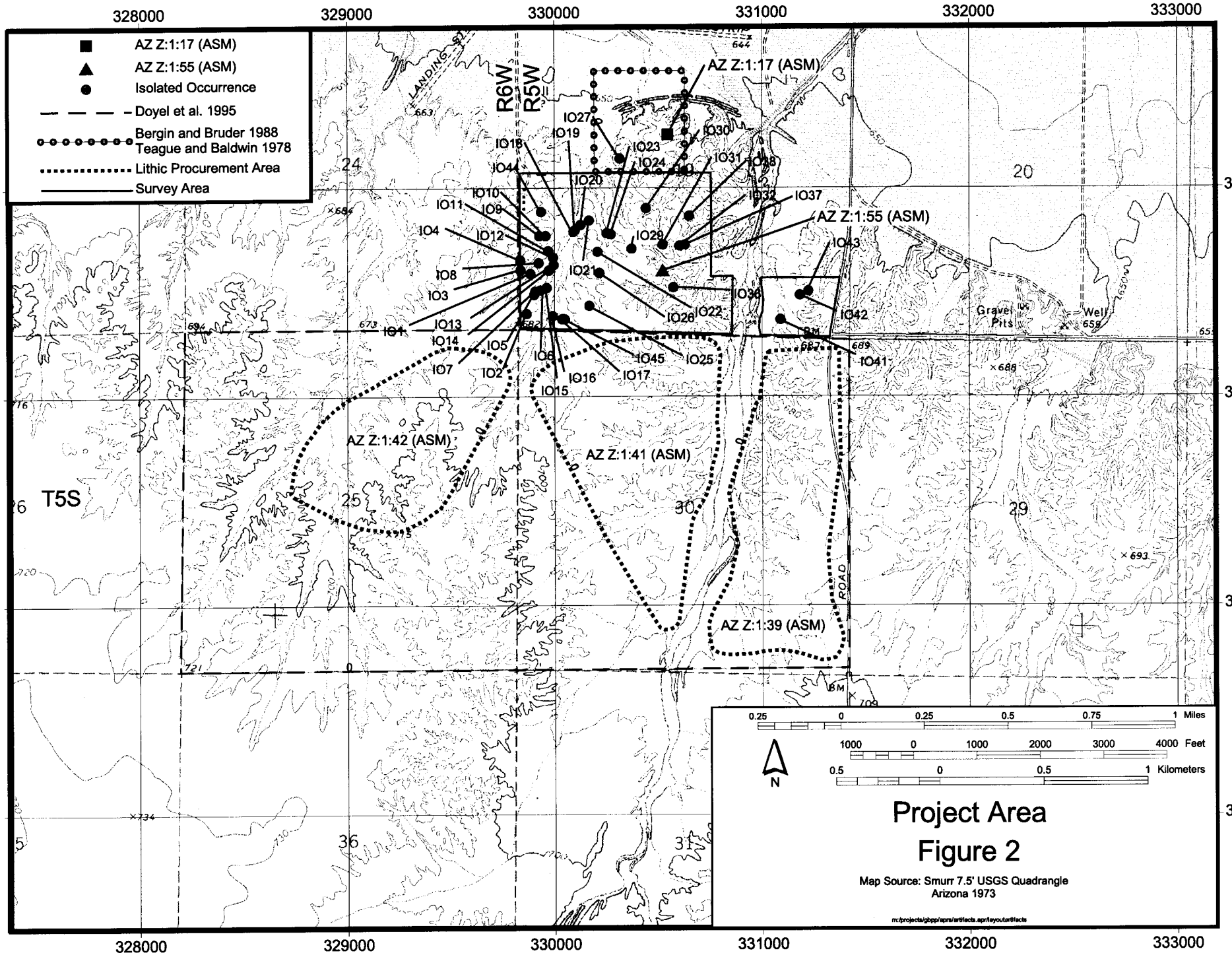
ENVIRONMENTAL SETTING

The proposed Gila Bend Power Project is located south of the Gila River, on the upper terraces of the Gila Bend Basin, situated within the Basin and Range Province. The climate of the project area is hot and arid. Summer temperatures average daily highs in excess of 100 degrees Fahrenheit (°F) (38 degrees Centigrade [°C]) from June through September. Annual precipitation averages approximately five to six inches, with violent thunderstorms occurring during the months of July and August (Sellers and Hill 1974).

The Gila Bend Basin is bounded by the Gila Bend Mountains to the north, the Maricopa and Sand Tank mountains to the east, the Sauceda Mountains to the south, and the Painted Rock Mountains to the west. The upper terraces of the area contain areas with moderate to well-developed desert pavements (Photograph 1).

The project area is situated within the Lower Sonoran desertscrub life zone (Turner and Brown 1994). Local vegetation on the terraces includes creosotebush, paloverde, bursage, ocotillo, pencil cholla, and saguaro. In the washes, vegetation typical of desert riparian scrub is found, including blue paloverde, catclaw acacia, and desert ironwood. Non-native tamarisk dominates most of the lower wash area (Photograph 2).

The only wildlife recognized during the survey were jackrabbits, lizards, and raptors. However, many small animals known to live within these subdivisions include not only jackrabbits and lizards, but also desert rats, desert mice, bats, tortoises, iguanas, and rattle snakes (Turner and Brown 1994). Larger animals such as deer, coyote, and javelina may be present, but are not common.


328000
329000
330000
331000
332000
333000
3650000
3649000
3648000
3647000
AZ Z:1:17 (ASM)
AZ Z:1:55 (ASM)
Isolated Occurrence
Doyel et al. 1995
Bergin and Bruder 1988
Teague and Baldwin 1978
Lithic Procurement Area
Survey Area
AZ Z:1:17 (ASM)
AZ Z:1:55 (ASM)
AZ Z:1:42 (ASM)
AZ Z:1:41 (ASM)
AZ Z:1:39 (ASM)
IO1
IO2
IO3
IO4
IO5
IO6
IO7
IO8
IO9
IO10
IO11
IO12
IO13
IO14
IO15
IO16
IO17
IO18
IO19
IO20
IO21
IO22
IO23
IO24
IO25
IO26
IO27
IO28
IO29
IO30
IO31
IO32
IO36
IO37
IO41
IO42
IO43
IO44
IO45
R6W
R5W
T5S
LANDING ST
ROAD
Gravel Pits
Well
BM
0.25 0 0.25 0.5 0.75 1 Miles
1000 0 1000 2000 3000 4000 Feet
0.5 0 0.5 1 Kilometers
N
Project Area
Figure 2
Map Source: Smurr 7.5' USGS Quadrangle
Arizona 1973
m:/projects/gbpp/apre/artifacts.apr/layout/artifacts

Photograph 1
Overview of Project Location Showing Area of Desert Pavement (view to the southwest)

Photograph 2
Non-native Tamarisk Trees Which Dominate Most of the Lower Wash Areas (view to the north)

CULTURAL HISTORY

The history of research in southwestern Arizona, specifically the Gila Bend area, is briefly reviewed, and a general outline of the cultural history of the region as it is currently understood is presented. Numerous research investigations have been conducted within this region. The most well-known project is the Arizona State Museum's salvage operations for the Painted Rocks Reservoir area (Wasley and Johnson 1965). Other well-known studies in the region include Gila Pueblo's survey of the Southwest in search of the "Red-on-buff" culture (Gladwin and Gladwin 1929, 1930), Malcom Rodgers' surveys across southwestern Arizona (McGuire and Schiffer 1982: 439-440; Rodgers 1939, 1966), and the Museum of Northern Arizona archaeological study of the Liberty to Gila Bend 230kV transmission system (Stein 1977).

The cultural history of the southwest is ordinarily discussed in five segments that roughly correspondence to changing lifeways and adaptations that are fairly contemporaneous throughout the region. These divisions include the Paleoindian, Archaic, Prehistoric, Ethnohistoric, and Historic periods. Paleoindian and Archaic periods represent traditions that do not possess ceramic technology and are generally believed to be mobile or semi-sedentary. The division between Prehistoric and Historic periods is generally understood as the point at which written records concerning the area become available. The Ethnohistoric Period refers to aboriginal or Native American cultural traditions, whereas the Historic Period refers to non-aboriginal (Euroamerican) cultural traditions.

Paleoindian Period (10,000 BC to 7500 BC)

The earliest occupation in the region is known as the Paleoindian Period. These groups hunted large game animals, collected native plant food, and were highly mobile. The populations during this time remained fairly small and dispersed. Residing in southwestern Arizona during this time was a group known as the Malpais. Traits characteristic of Malpais materials are unifacially flaked stone choppers and scrappers that are often heavily coated with desert varnish. Some of these artifacts have been associated with sleeping circles, trails, shrines, and intaglios (Hayden 1982). Other researchers (McGuire and Schiffer 1982) have found that these traits are not exclusive to the Malpais, but are also associated with later archaic and formative cultures of the region.

The San Dieguito complex post-dates the Malpais culture. The San Dieguito is the desert equivalent of more commonly known Paleoindian traditions such as Clovis and Folsom. Three phases have been differentiated for the San Dieguito complex and are distinguished by the presence or absence of certain kinds of tools. In general, the San Dieguito complex has a wider variety of tool types than other Paleoindian traditions. Chipped stone tools associated with the San Dieguito complex includes notched cobbles, cores, hammerstones, cleavers, cobble choppers, beveled flakes, and other specialized flakes.

Elsewhere in the Southwest, the Paleoindian Period is characterized by the Clovis and Folsom traditions. The Clovis tradition predates the Folsom tradition and is associated with hunting large mammals such as mammoths and mastadons. Clovis points are large spear points that have been partially fluted. The Folsom tradition, associated with hunting somewhat smaller mammals such as bison, probably descended from the Clovis tradition. Much like the Clovis point, the Folsom point retains and expands the characteristic fluting trait of the earlier Clovis point.

Evidence for the Paleoindian culture within the Gila Bend area is scarce. However, in their overview of southern Arizona, Whittlesey et al. (1994) had identified a reworked Folsom point along the Gila River in the Painted Rocks Reservoir area.

Archaic Period (7500 BC to AD 200)

The transition from the Paleoindian Period to the Archaic Period is marked by the extinction of the large Pleistocene mammals. While this is not the only factor influencing the shift from large-scale hunting to small-scale hunting and plant processing, most scholars believe that this was at least one factor in the subsistence shift that characterizes the subsequent Archaic Period. During the Archaic Period, people began to focus on hunting smaller animals and collecting a wider variety of plant resources. Archaic groups also adapted their social organization to a changing social environment by aggregating into larger social groups. Sites such as camp clearings, zoomorphic intaglios, trails, and shrines are often associated with the Archaic period. Artifact assemblages during this time demonstrate a wider variety of chipped stone artifacts, and an increasing dependence on ground stone artifacts. Archaic period artifact assemblages in southern Arizona are known as Amargosa and Cochise complexes. Stylistic changes in Archaic spear points allow scholars to distinguish between these two complexes.

Archaeological investigations within the Harquahala Valley have identified several diagnostic projectile points along Centennial Wash (Bostwick 1988; Stone 1986). However, no previously archaic sites have been identified within the project area.

The end of the Archaic period is associated with early agriculture, the beginning of settled village life, and pottery production. The adoption of new technologies such as pottery production and farming is a slow process. Experimenting with new technologies was an on-going process. For example, the increase in ground stone artifacts suggests an increased reliance toward plant processing activities and possibly toward the beginning of domestication. Pieces of a rare plain brown ware were identified in late archaic sites within Arizona, demonstrating experimentation with early ceramic containers.

Prehistoric Period (AD 300 to AD 1400)

Subsistence strategies changed during this period to reflect an increasing reliance on farming. The prehistoric population was expanding and settlement systems were adapting to cope with

this increase. Villages became more permanent and ceramics were produced more regularly. Two ceramic period traditions, the Hohokam and the Patayan, succeeded the Archaic in southwestern Arizona. These traditions are distinct in their farming strategies and ceramic assemblages.

Hohokam villages along the Gila River were large with numerous public features such as ball courts, platform mounds, and canals. The Hohokam are characterized by Red-on-buff ceramics, stone pallettes, and shell ornaments. Haury (1976) has identified four major periods within the Hohokam chronology. The beginning date for the Hohokam is a matter of debate. The earliest period is the Pioneer, which dates from the beginning of the first few centuries BC to AD 750. This period is followed by the Colonial Period, which is roughly AD 750 to AD 950. The third period, the Sedentary, is roughly AD 950 to AD 1150, with the Classic Period from about AD 1150 to at least AD 1450. In the core area, around the Gila River, the Hohokam have been described as sedentary agriculturalists that practice irrigation farming. The Gatlin Site, AZ Z:2:1 (ASM), is a Sedentary/Colonial Period Hohokam village located approximately 2 miles northeast of Gila Bend.

The Patayan cultural tradition is centered along the Lower Colorado River. As a result of a paucity of studies concerning the Patayan culture, little is known about this culture. Lower Colorado Buffware ceramics and floodwater farming characterize the Patayan. Malcom Rodgers (1945) has divided the Patayan cultural sequence into three periods. Ceramics from these sequences have been cross-dated with known Hohokam ceramics in order to refine the temporal association of the Patayan periods. Patayan I is believed to date from AD 700 to AD 1000, with Patayan II extending from AD 1000 to AD 1500. Patayan III continues into the AD 1800 or AD 1900s. Patayan sites are located away from major rivers, often within the desert. Since these sites were so far from major rivers, it has been inferred that the Patayan probably had developed an adaptation to non-riverine environments. From an ecological point of view, this would allow the Patayan to exploit a niche that was not in direct competition with other riverine groups in the area, such as the Hohokam.

Ethnohistoric Period (AD 1400 to AD 1600)

Arizona was inhabited by a variety of cultures during the ethnohistoric period. European explorers encountered numerous aboriginal groups in western Arizona including speakers of the Hokan and Shoshonean lanaguages. The Hokan speakers included groups such as the Quechen [Yuman], Mohave, Cocopah, Maricopa, and Yavapai; and the Shoshonean speakers included the Chemehuevi.

Each group occupied a specific portion of Arizona. The Yavapais inhabited west-central Arizona above the Gila and Salt rivers, while the various O'odham groups lived south of the Gila River. Along the lower Gila and Colorado River valleys lived the group that came to be known as the Maricopa. Migrations and interactions between these groups were frequent, often as the result of trading or warfare. The Spanish mapped and described many of the Native American

settlements. However, relocating these sites are problematic because of confusion over names, summer versus winter residences, and mapping errors (Whittlesey et al. 1994).

Historic Period (AD 1600 to AD 1950)

Spanish explorers traveled southwestern Arizona during the sixteenth through the eighteenth centuries. Early explorers were lured to the area by a desire for vast wealth, springing from the legendary Seven Cities of Cibola (Whittlesey et al. 1994). A hundred years later Jesuit missionary Father Kino visited Arizona. Several short-lived missions were established near Yuma in 1780 (Walker and Bufkin 1986). The first Euroamericans visited the Gila Bend area in 1699. During this time, Spanish controlled the area until the Mexicans regained control in 1821.

Historically, and probably prehistorically, the Gila River has served as a guide for explorers to cross Arizona. During the gold rush of 1849, thousands of immigrants traveled down the Gila and Santa Cruz rivers to California. During the war of independence from Mexico, Colonel Kearny led the Army of the West over a trail following the Gila River. The Butterfield Overland Mail (aka Southern Overland Trail) followed the Gila River delivering items between 1858 and 1961 (Walker and Bufkin 1986). The Gila Ranch Station was established on the Gila Trail (aka Southern Overland Trail) and became an important stop for travelers between Tucson and Yuma (Walker and Bufkin 1986).

After the United States acquired Arizona through war with Mexico and the Gadsden Purchase of 1854, Euroamerican settlement increased dramatically. By the 1860s, American settlers began farming the Gila Bend area. By the late 1880s, the Southern Pacific Railroad brought supplies and settlers to Gila Bend. Early farmers excavated irritation ditches to begin farming the area near Gila Bend. The erratic flow of the Gila River destroyed many of the early farms. It was the completion of Gillespie Dam in 1921 that promoted agricultural development in the Gila Bend area.

RECORDS REVIEW

Archaeological Consulting Services (ACS) previously conducted a Class I records check for the Gila Bend Power Project as part of the CEC application (Macnider 2000). ACS reviewed the files maintained by the Arizona State Museum and the SHPO for previously identified archaeological sites and surveys located within a 2-mile radius of the project area. The records review identified six previous cultural resource studies and 20 previously recorded sites within its research area.

Prior Cultural Resource Studies

Of the six previous surveys that have been identified within the 2-mile radius of the project area, one study is of particular interest (Table 1). In 1995, ACS conducted an investigation of the area south of the proposed power plant on behalf of Continental Waste Industries for the construction of a Gila Bend landfill (Doyel et al.1995). During that survey four sites were identified. Three of the four sites consist of large lithic procurement areas that include feature concentrations with several chipping stations. Though widely spaced apart, these features and stations were included to create sites that span the top of the terraces. Subsequent data recovery was conducted at these sites (Doyel et al. 1996). The result of this research indicated that the lithic procurement sites within this area held little or no potential for buried deposits of cultural materials.

TABLE 1
PRIOR CULTURAL RESOURCES STUDIES

Project Name	Total Area Surveyed	Number of Sites	Reference
Painted Rocks Reservoir: Salvage Archaeology	200+	3	Wasley and Johnson 1965
Painted Rocks Reservoir Project: Preliminary Survey	4,100	4	Teague and Baldwin 1978
Painted Rocks Reservoir	6,000	28	Bergin and Bruder 1988
Painted Rocks Reservoir Survey and Management Plan	4,140	48	Bernard-Shaw 1990; Dart et al. 1989
Proposed Materials Source Pit	50	4	Wright 1993
Gila Bend Landfill Survey and Data Recovery	550	4	Doyel et al. 1995, 1996

Previously Recorded Cultural Resources

Of the 20 previously recorded archaeological sites identified by ACS, 4 are located in close proximity to the project area (Table 2). These include sites AZ Z:1:17 (ASM), AZ Z:1:39 (ASM), AZ Z:1:41 (ASM), and AZ Z:1:42 (ASM). Site AZ Z:1:17 (ASM) was recorded as part of the Painted Rocks Reservoir development and consists of a lithic scatter and quarry site; however, it was recently noted that the site was destroyed by modern quarrying activities (Macnider 2000:4)

Sites AZ Z:1:39 (ASM), AZ Z:1:41 (ASM), and AZ Z:1:42 (ASM) were recorded by ACS during their cultural resource survey for the Gila Bend Landfill Project (Doyel et al. 1995). Site AZ Z:1:39 (ASM) was described as containing 93 chipping stations and 7 rock clusters with 2 artifact concentrations. Similar to site AZ Z:1:39 (ASM), site AZ Z:1:42 (ASM) was described as containing 122 chipping stations, 11 rock clusters, and 3 small artifact concentrations. The remaining site, AZ Z:1:42 (ASM), has a lower density of lithic features with only 40 chipping stations and 2 concentration areas. No rock clusters were observed within the site AZ Z:1:42

(ASM). Materials identified within these sites include basalt, chert, chalcedony, jasper, quartzite, quartz, and rhyolite. Quartzite was the dominant material source.

TABLE 2
PREVIOUSLY RECORDED CULTURAL RESOURCES
IDENTIFIED NEAR THE STUDY AREA

Site Number	Description	Status	Reference
AZ T:13:42(ASM)	Cobble tools and primary flakes, some heavily patinated	Site not relocated in 1986	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ T:13:43(ASM)	Metate fragments and chipped stone flakes	Site not relocated in 1986	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ T:13:44(ASM)	Lower Colorado Buffware, Gila Polychrome, primary flakes	Site flooded and reclaimed for cultivation, small portion of original site left in 1986	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ T:13:48(ASM)	Patayan? lithic and ceramic	Site has been inundated	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ Z:1:7(ASM)	Hohokam ceramic scatter with assorted stone tools and features	Site lost to erosion by 1960	N/A
AZ Z:1:11(ASM)	Hohokam ceramic scatter	Excavated	Wasley and Johnson 1965
AZ Z:1:12(ASM)	Lower Colorado River buffware ceramic scatter	Excavated	Wasley and Johnson 1965
AZ Z:1:13(ASM)	Historic Papago redware and plainware ceramics	Eight structures excavated	Wasley and Johnson 1965
AZ Z:1:15(ASM)	Lithic scatter	Excavated	Bergin and Bruder 1988
AZ Z:1:16(ASM)	Lithic scatter	Excavated	Bergin and Bruder 1988
AZ Z:1:17(ASM)*	Lithic scatter and quarry	Excavated	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ Z:1:18(ASM)	Historic mine shaft	Site inundated and covered with overgrown tamarisk	Bergin and Bruder 1988; Teague and Baldwin 1978
AZ Z:1:25(ASM)	Prehistoric artifact scatter	Recommended as eligible	Wright 1993
AZ Z:1:26(ASM)	Prehistoric lithic scatter	Recommended as eligible	Wright 1993
AZ Z:1:27(ASM)	Prehistoric artifact scatter	Recommended as eligible	Wright 1993
AZ Z:1:28(ASM)	Prehistoric trail segment	Recommended as eligible	Wright 1993
AZ Z:1:39(ASM)*	Extensive lithic procurement and processing area	Recommended as eligible; data recovery completed	Doyel et al. 1995, 1996
AZ Z:1:40(ASM)	Trash dump	Recommended as not eligible	Doyel et al. 1995, 1996
AZ Z:1:41(ASM)*	Extensive lithic procurement and processing area	Recommended as eligible; data recovery completed	Doyel et al. 1995, 1996
AZ Z:1:42(ASM)*	Extensive lithic procurement and processing area	Recommended as eligible; data recovery completed	Doyel et al. 1995, 1996

*Located within ¼ mile of the proposed project area
Source: Macnider 2000

SURVEY EXPECTATIONS

The information identified during the literature review indicates that cultural materials are fairly common within the project vicinity. The upper terraces overlooking the Gila River contain an abundance of easily available lithic materials that were obtained to produce stone tools and other flaked-stone items. Exploitation of these materials produces low-density scatters of chipped-stone debitage. Features associated with the harvesting and processing of native plants could potentially be present within the study area as well. Desert pavement is common in this area and when artifacts are identified upon intact desert pavement, subsurface remains are usually not present.

As mentioned previously, the majority of the known sites are lithic procurement areas that are found on the upper terraces just south of the Gila River. The density of lithic materials in the section south of the project area is low. Based upon the previous research, we anticipate encountering small, low-density chipping stations and lithic procurement areas within the study area.

FIELD SURVEY METHODS

The field crew identified the survey area using the Smurr 7.5 minute USGS topographic quadrangle. The western, eastern, and southern edges were defined by previously existing roads. The field crew surveyed the proposed plant site and access road by walking transects spaced 15 to 20 meters (50 to 65 feet) apart. A GeoExplorer III global positioning system (GPS) unit was used to map the boundaries of the survey area and the location of isolated occurrences, sites, and topographic features. This unit has an accuracy of 1 to 5 meters with differential correction.

The survey area included dissected terraces that were easily traversed. Vegetation consisted of primarily creosote bush and bursage with the occasional occurrence of saguaro and cholla. Ground visibility along the tops and slopes of these terraces was high, making it easy to inspect the ground for artifacts and features. Vegetation within the low-lying areas of the wash bottoms, however, was very dense and consisted predominantly of non-native tamarisk trees. These portions of the project area were not intensively surveyed because the vegetation was too dense to traverse and obscured ground visibility.

Sites identification and boundaries were defined according to ASM Guidelines. ASM Site Recording manual (version 1.1) specifies that a site is the physical remains of past human activity that is at least 50 years old. An artifact concentration is described as 30 or more artifacts within an area measuring no more than 15 meters in diameter, within the exclusion of artifacts obviously from the same item.

An ASM letter dated 1 October 1994 further specifies what may constitute a site. These additional situations include the following:

- 20 or more artifacts, including at least two classes of artifact types within an area 15 meters in diameter
- one or more archaeological features in association with any number of artifacts
- two or more temporary associated archaeological features without any artifacts

ASM recognizes that there may be situations that warrant designations as an archaeological site, and give archaeologists authority to use their professional judgments in making appropriate field determinations.

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

All cultural material was recorded according to type and material and its location plotted with the GPS. Within each artifact class, further designations were used to describe each artifact. These designations were used to draw inferences concerning the activities that may have occurred at each location.

Chipped stone material was identified according to the stages of lithic manufacturing and was labeled as primary, secondary, or tertiary flakes. We broadly define each of the flakes types as follows:

- Primary flakes have an exterior side of all cortex and are the result of initial core reduction.
- Secondary flakes have a thin edge of cortex and represent the middle process of tool manufacturing.
- Tertiary flakes are typically very thin and do not have cortex. Often known as bifacial thinning flakes, these flakes represent the last stage in tool manufacturing.

Cores were identified as either unifacially or bifacially flaked and were recorded as either unidirectional or multidirectional. Unidirectional or multidirectional core designations describe the location of the striking platform.

SURVEY RESULTS

In total, 45 isolated occurrences and 1 site were identified during the survey. All of the cultural materials identified within the project area consist of low-density scatters of lithic artifacts. The isolated occurrences are discussed first, followed by a discussion of the archaeological site. The isolated occurrences identified during the survey are listed in Table 3.

TABLE 3
TABULATION OF ISOLATED OCCURRENCES

Number	IO Type	Description	Area	Comments
IO 1	Lithic scatter	1 brown chert secondary flake, 1 purple chert primary flake, 1 brown rhyolite primary flake, 1 purple/brown multidirectional core	1x2 m	
IO 2	Lithic scatter	1 tan/grey chert primary flake	1x1 m	
IO 3	Lithic scatter	1 quartzite secondary flake, 1 grey rhyolite unidirectional core, 1 purple fine-grained rhyolite tertiary flake, 11 primary grey rhyolite flakes	5x10 m	near road
IO 4	Lithic scatter	1 red chert primary flake	1x1 m	
IO 5	Lithic scatter	1 quartzite primary flake	1x1 m	
IO 6	Lithic scatter	1 grey fine-grained rhyolite secondary flake	1x1 m	
IO 7	Lithic scatter	1 tan chert secondary flake, 2 brown chert primary flakes	1x6 m	
IO 8	Lithic scatter	1 brown rhyolite secondary flake	1x1 m	Located within wash
IO 9	Lithic scatter	1 tan chert secondary flake, 1 quartzite secondary flake	1x1 m	
IO 10	Lithic scatter	1 basalt secondary flake	1x1 m	Modern trash dump located near north end of transect 3
IO 11	Lithic scatter	1 chert primary flake	1x1 m	modern trash dump near house, ceramic plates, metal cans, etc.
IO 12	Lithic scatter	2 brown fine-grained rhyolite secondary flakes, 1 brown fine-grained rhyolite unidirectional core, 1 pink rhyolite secondary flake, 1 pink quartzite primary flake, 2 pink quartzite secondary flakes, 1 pink quartzite unidirectional? Core	1x4 m	two distinct areas
IO 13	trash dump	modern, cars, bottles and automotive parts	1x3 m	
IO 14	Lithic scatter	1 pinkish quartzite secondary flake, 1 quartzite primary flake	1x1 m	
IO 15	Lithic scatter	1 brown rhyolite secondary flake, 4 chert flakes	1x3 m	
IO 16	Lithic scatter	1 fine-grained white quartzite primary flake	1x1 m	

TABLE 3
TABULATION OF ISOLATED OCCURRENCES

Number	IO Type	Description	Area	Comments
IO 17	Lithic scatter	4 white quartzite secondary flakes, 3 tan rhyolite primary flakes, 3 tan rhyolite secondary flakes, 2 tan rhyolite multi-directional cores 1 brown chert secondary flake, 1 purple rhyolite primary flake, 2 purple rhyolite secondary flake, 2 fine-grained basalt secondary flakes, 1 fine-grained basalt bi-directional cores	11x14 m	
IO 18	Lithic scatter	15 to 20 brown chert flakes	2x2 m	Reduction of single nodule
IO 19	Lithic scatter	1 fine-grained basalt tertiary flake	1x1 m	
IO 20	Lithic scatter	1 white chert unidirectional core	1x1 m	
IO 21	Lithic scatter	1 orange chert utilized secondary flake	1x1 m	
IO 22	Lithic scatter	1 grey chert secondary flake	1x1 m	
IO 23	Lithic scatter	1 pinkish tan quartzite secondary flake	1x1 m	
IO 24	Lithic scatter	1 fine-grained basalt secondary flake	1x1 m	
IO 25	Lithic scatter	2 brown chert tertiary flakes, 1 brown chert bidirectional core	1x2 m	
IO 26	Lithic scatter	1 tan chert secondary flake	1x1 m	
IO 27	Lithic scatter	1 purple rhyolite primary flake	1x1 m	
IO 28	Lithic scatter	1 tan/white chert secondary flake	1x1 m	
IO 29	Lithic scatter	1 grey chert secondary flake	1x1 m	
IO 30	Lithic scatter	1 grey black chert secondary flake	1x1 m	
IO 31	Lithic scatter	2 purple rhyolite secondary flakes, 1 purple rhyolite primary flake	1x1 m	
IO 32	Lithic scatter	2 tan rhyolite secondary flakes	1x1 m	modern strapping trash nearby
IO 33	Lithic scatter	10 red rhyolite secondary flakes, 1 red rhyolite primary flake	1x1 m	
IO 34	Lithic scatter	1 red chert secondary flake	1x1 m	
IO 35	Lithic scatter	1 red rhyolite secondary flake, 1 tan chert tertiary flake	1x1 m	
IO 36	Lithic scatter	1 quartzite tertiary flake	1x1 m	
IO 37	Lithic scatter	3 tan chert tertiary flakes,	1x1 m	
IO 38	Lithic scatter	5 purple rhyolite secondary flakes, 6 purple rhyolite tertiary flakes, 1 purple rhyolite primary flake, 2 tan chert primary flakes, 1 tan chert utilized tertiary flake	2x2 m	
IO 39	Lithic scatter	1 grey chert scrapper	1x1 m	
IO 40	Lithic scatter	1 grey chert multidimensional core	1x1 m	
IO 41	Lithic scatter	1 grey chert secondary flake, 1 purple rhyolite primary flake	1x2 m	
IO 41	Lithic scatter	1 white quartzite multi-directional core, 1 brown chert primary flake, 1 white quartzite primary flake	1x2 m	

TABLE 3 TABULATION OF ISOLATED OCCURRENCES				
Number	**IO Type**	**Description**	**Area**	**Comments**
IO 43	Lithic scatter	1 purple rhyolite primary flake	1x1 m	
IO 44	Lithic scatter	1 secondary tan chert flake	1x1 m	
IO 45	Lithic scatter	1 purple rhyolite utilized flake	1x1 m	

Isolated Occurrences

The isolated occurrences (IO) were identified throughout the project area, with slightly more IOs within the western half. Most of the isolated occurrences are on the upper terrace. The IOs were made out of materials such as basalt, chert, rhyolite, and quartzite. Of the three flake categories, the majority of IOs were secondary flakes accounting for 47 percent of all identified flakes. Following secondary flakes, primary flakes were next highest with 33 percent. Only 20 percent of identified flakes were tertiary.

These IOs do not meet the Arizona State Museum criteria to qualify as a site. Because they do not qualify as sites, they are not eligible for listing on the National or State Registers of Historic Places. Our recording of these items has essentially exhausted their research potential and, therefore, it is our recommendation that no further consideration of these isolates is needed.

Site AZ Z:1:55 (ASM), Lithic Scatter

Site AZ Z:1:55 (ASM) consists of a low-density scatter of chipped stone artifacts covering a 204 square meter area (Figure 3). The site is located on private land in the SW¼ of Section 19, T5S, R5W (see Figure 2).

Environmental Setting

Site AZ Z:1:55 (ASM) is situated atop a low ridge on the upper terraces of the Gila Bend Basin (Photograph 3). Surrounding the basin are the Gila Mountains to the north, the Maricopa Mountains to the east, and the Sauceda Mountains to the south. The Gila River is approximately 3 miles to the south. The site is at an elevation of 680 feet above sea level. A weakly developed desert pavement is present in some areas of the ridge with creosote bush the primary vegetation.

Surface Observations

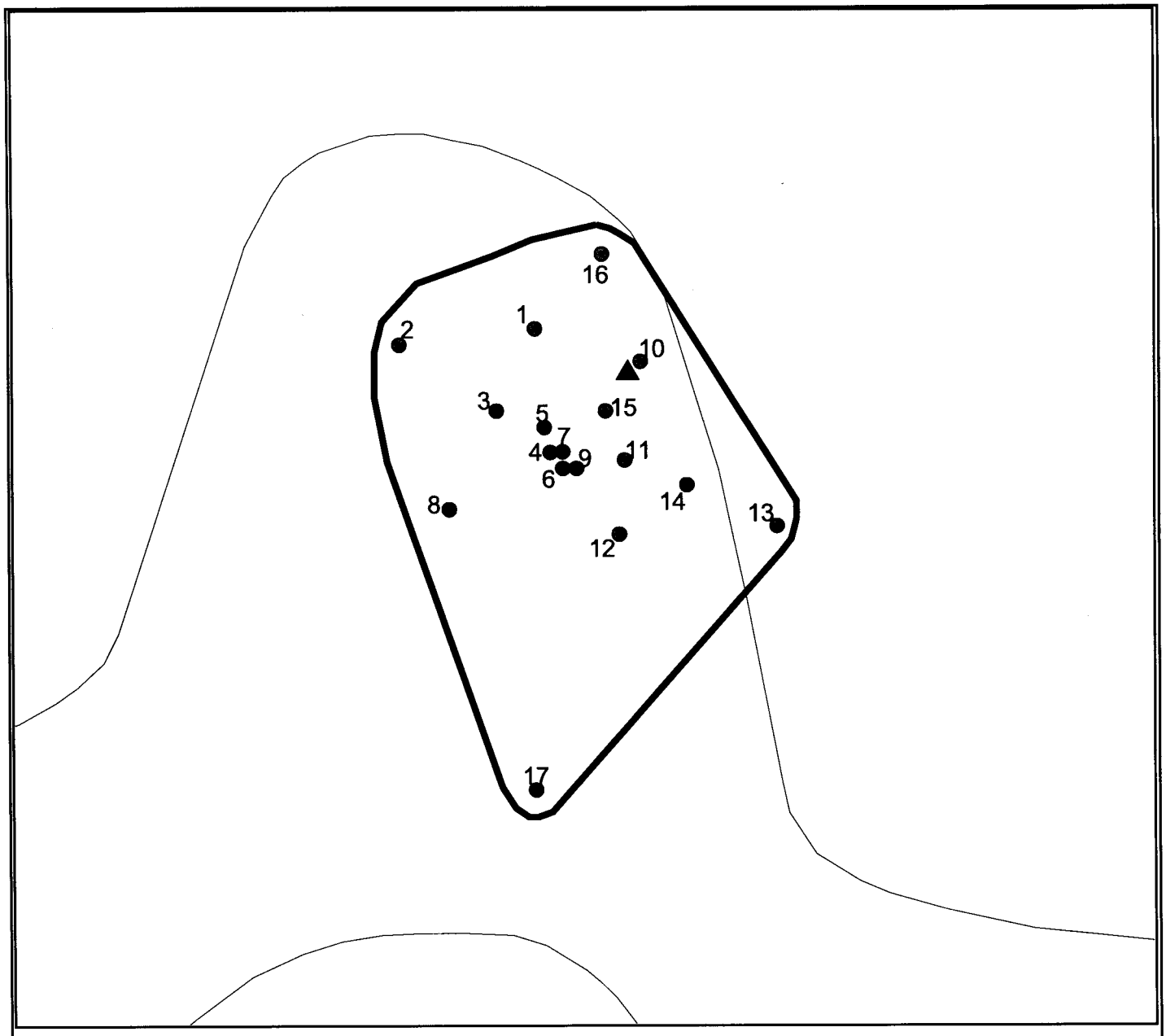
Site AZ Z:1:55 (ASM) consists of 35 pieces of flaked stone. Various material types are present at the site including rhyolite, quartzite, chert, and basalt. Flaked stone items were identified as primary, secondary, and tertiary flakes. Cores were also identified within the site. One utilized

fine-grained basalt secondary flake was identified. Each artifact was plotted with the GPS. Table 4 lists all of the items observed at the site.

Photograph 3
Overview of Site AZ Z:1:55 (ASM) (view to the west)

TABLE 4
INVENTORY OF SURFACE ARTIFACTS, SITE AZ Z:1:55 (ASM)

Artifact Number	Description
1	1 purple rhyolite core, 1 purple rhyolite secondary flake
2	1 purple rhyolite flake
3	1 tan chert primary flake, 1 quartzite secondary flake
4	1 quartzite secondary flake
5	3 purple rhyolite secondary flakes
6	1 purple rhyolite secondary flake
7	2 purple rhyolite primary flakes
8	1 purple rhyolite secondary flake
9	1 tan chert secondary flake, 1 grey chert secondary flake
10	1 grey chert primary flake
11	1 tan rhyolite multi-directional core
12	1 grey chert primary flake
13	1 quartzite primary flake
14	1 quartzite primary flake
15	2 quartzite multi-directional cores, 1 quartzite primary flake
16	4 quartzite secondary flakes
17	2 fine-grained basalt primary flakes, 2 fine-grained basalt secondary flakes



2 0 2 4 6 8 Meters

8 0 8 16 24 Feet

Datum

Artifact

Site Boundary

Contour Line (schematic)

N

Site AZ Z:1:55 (ASM)
Figure 3

m:/projects/gbpp/apra/artifacts.apr/LayoutSite

Site boundaries were determined by walking transects at an interval of 1 meter across the entire site area to establish the extent of the artifact distribution. Boundaries were arbitrarily set on all sides as dictated by the distribution of artifacts. The site is approximately 12 meters by 17 meters. Additional reconnaissance along the ridge did not identify any further isolates or features.

Evidence of Site Age and Function

Lithic artifacts recorded at the site are of locally available materials. The majority of the flakes identified at AZ Z:1:55 (ASM) are primary and secondary flakes. In procuring lithic resources, these kinds of flakes would be removed in order to test whether the rock was of quality material as well as to prepare cores for transportation to another area. Based upon this evidence, we suggest that this site was an initial reduction area of locally available materials. The artifacts appear to have been expediently flaked. There is no evidence to suggest that this area was a formal quarry or that the formal production of stone tools was conducted here.

The lithic technology at the site indicates that this site is of prehistoric or ethnohistoric origin. No diagnostic artifacts were recovered that could provide a more precise date. Some of the artifacts appear to have a light repatination or desert varnish, but the rate of patination is not well understood. A more precise date would be speculation.

National Register Assessment

Intact desert pavement is prevalent throughout most of the site, confirming that it has not been previously disturbed. Because of the presence of desert pavement, the potential for subsurface features is very low. The condition of the site can be characterized as good and it appears to have retained its archaeological integrity.

The distribution of surface artifacts on desert pavement indicates that site AZ Z:1:55 (ASM) has little or no potential for containing intact deposits of buried cultural materials and our recording of the site has essentially exhausted its information potential. Similar sites located just south of the proposed plant site have been studied previously (Doyel et al. 1996) and any further investigation is not expected to provide any new information. Therefore, we recommend that site AZ Z:1:55 (ASM) is not eligible for listing on either the State or National Register of Historic Places.

CONCLUSIONS AND RECOMMENDATIONS

The intensive pedestrian survey of the proposed Gila Bend Power Project resulted in the identification of 45 isolated occurrences of cultural materials and one prehistoric archaeological site, AZ Z:1:55 (ASM). Neither the isolated occurrences nor the site are eligible for listing on the

National Register of Historic Places, and we conclude that no significant archaeological or historical properties appear to be threatened by ground-disturbing activities associated with the proposed Gila Bend Power Project. Therefore, we recommend that the proposed Gila Bend Power Project will have no affect on historic properties.

If, however, any human remains or funerary objects were to be unexpectedly discovered during construction, work in that area should cease and the finding should be reported to the director of the Arizona State Museum in accordance with Arizona Revised Statutes §41-465.

REFERENCES CITED

Bergin, K. and J. Simon Bruder
1988 *A Cultural Resources Site Inventory at Painted Rocks Reservoir, Maricopa County, Arizona.* Harmsworth Associates Archaeological Research Paper No. 2. Laguna Hills.

Bernard-Shaw, Mary
1990 *Archaeological Survey in the Painted Rock Reservoir Area, Western Arizona.* Technical Report No. 89-10(5-6). Center for Desert Archaeology, Tucson.

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

Dart, Allen, Steven Lekson, and Henry D. Wallace
1989 *Historic Properties Management Plan for the U.S. Army Corps of Engineers Painted Rock Reservoir Project, Southwestern Arizona.* Institute for American Research Technical Report 88-6. Tucson.

Doyel, David E., Bradley E. Ensor, and Ruth Rubenstein
1995 *An Archaeological Survey of a Proposed Landfill Near Gila Bend, Maricopa County, Arizona.* Archaeological Consulting Services Ltd., Tempe.

Doyel, David E., John Rapp, Bruce Phillips, C. Scott Crownover, and Barbara S. Macnider
1996 *Lithic Resources and Land Use in the Gila Bend Landfill, Town of Gila Bend, Maricopa County, Arizona.* Cultural Resources Report No. 96. Archaeological Consulting Services Ltd., Tempe.

Gladwin, Winifred and Harold S. Gladwin
1929 *The Red-on-buff Culture of the Papagueria.* Medallion Papers No. 4. Gila Pueblo Archaeological Foundation, Globe, Arizona.

1930 *The Western Range of the Red-on-Buff Culture.* Medallion Papers No. 5. Gila Pueblo Archaeological Foundation, Globe, Arizona.

Haury, Emil W.
1976 *The Hohokam: Desert Farmers and Craftsmen.* University of Arizona Press, Tucson.

Hayden, Julian
1982 Ground Figures of the Sierra Pinacate, Sonora, Mexico. In *Hohokam and Patayan: Prehistory of Southwestern Arizona,* edited by Randall McGuire and M. Schiffer, pp. 581-588. Academic Press, New York.

Macnider, Barbara S.
2000 *Cultural Resource Assessment for the Gila Bend Power Generating Plant, Maricopa County.* ACS Project Number 00-14. Archaeological Consulting Services, Ltd. Tempe.

McGuire, Randall and M. Schiffer
1982 *Hohokam and Patayan: Prehistory of Southwestern Arizona.* Academic Press, New York.

Rodgers, Malcolm J.
1939 *Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Areas.* San Diego Museum Papers No. 3. Museum of Man, San Diego.

1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology.* 1:67-198.

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

Sellers, William D. and Richard H. Hill
1974 *Arizona Climate, 1931-1972* (second edition, revised). University of Arizona Press. Tucson.

Stein, Pat H. (editor)
1977 *Archaeological Studies of the Liberty to Gila Bend 230kV Transmission System.* Anthropology Research Report No. 5. Museum of Northern Arizona, Flagstaff.

Stone, Connie L.
1986 *Deceptive Desolation: Prehistory of the Sonoran Desert in West Central Arizona.* Cultural Resource Series Monograph No. 1. Bureau of Land Management, USDI, Phoenix.

Teague, L. S. and A. R. Baldwin
1978 *Painted Rock Reservoir Project Phase I: Preliminary Survey and Recommendations.* Archaeological Series No. 126. Arizona State Museum, University of Arizona, Tucson.

Turner, Raymond M. and David E. Brown
1994 Sonoran Desertscrub. In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by David E. Brown, pp. 180-222 University of Utah Press, Salt Lake City.

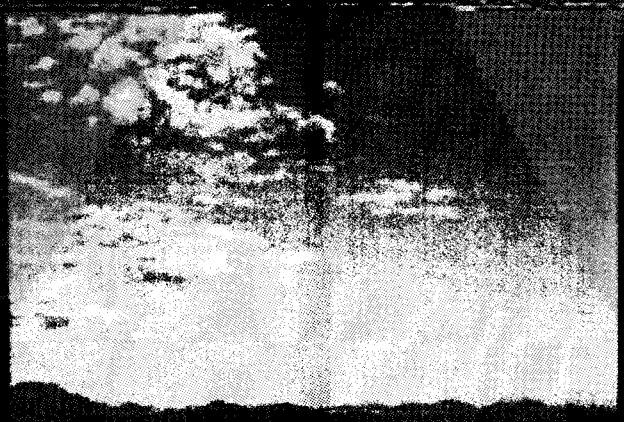
Walker, Henry P. and Don Bufkin
1986 *Historical Atlas of Arizona,* 2nd ed. University of Oklahoma Press, Norman.

Wasley, William W. and Alfred E. Johnson
1965 *Salvage Archaeology in Painted Rocks Reservoir, Western Arizona.* Anthropological Papers No. 9. University of Arizona, Tucson.

Whittlesey, Stephanie M., Richard S. Ciolek-Torrello, and Mathew A. Steiner
1994 *Southern Arizona The Last 12,000 Years: A Cultural-Historic Overview for the Western Army National Guard Aviation Training Site.* Statistical Research Technical Services, No. 48, Tucson.

Wright, Thomas
1993 *A Cultural Resources Survey of Approximately 50 Acres for a Proposed Materials Source Northwest of Gila Bend, Maricopa County, Arizona.* Archaeological Research Services Project Report #93:83. Archaeological Research Services, Inc., Tempe.

EXHIBIT
A-8
admitted



GILA BEND POWER PROJECT
LAND MANAGEMENT PLAN

Prepared for
Arizona Power Plant and Transmission Line Siting Committee

Prepared by
Gila Bend Power Partners, LLC

December 15, 2000

GILA BEND POWER PROJECT

LAND MANAGEMENT PLAN

Prepared for

Arizona Power Plant and Transmission Line Siting Committee

Prepared by

Gila Bend Power Partners, LLC

December 15, 2000

TABLE OF CONTENTS

LIST OF FIGURES

SECTION 1 – INTRODUCTION

PROJECT BACKGROUND

Gila Bend Power Partners, LLC (GBPP), proposes to develop, construct, own, and operate the Gila Bend Power Project, a nominal 845 megawatt (MW) natural gas-fired, combined cycle power plant (Project) to be located in a recently annexed portion of the Town of Gila Bend in Maricopa County, Arizona. The Town Planning Commission, in conjunction with GBPP, has recently approved a rezoning of the plant site area to a Basic Manufacturing and Industrial Zone (I-3), and has also approved a general plan amendment that is consistent with the proposed Project.

PURPOSE OF THE LAND MANAGEMENT PLAN

The Land Management Plan (LMP) has been developed to address long- and short-term practices associated with the plant site and surrounding area including the remaining lands owned by GBPP. The LMP is consistent with concepts as identified in the *Gila Bend Power Partners LLC Application for a Certificate of Environmental Compatibility,* and includes a supplemental preliminary site plan that is being developed in accordance with the Town of Gila Bend Site Plan Approval process.

ORGANIZATION OF THE PLAN

The LMP has been organized into four sections. These sections are listed below and briefly described.

- Section 1 – Introduction
- Section 2 – Land Management Practices
- Section 3 – Preliminary Site Plan
- Section 4 – Letters

Section 1 provides a general description of the Project background and purpose of the LMP. Section 2 describes the Project area and land management practices associated with development of the Project. Section 3 presents the site plan currently under development with the Town of Gila Bend. Section 4 includes letters from the Town of Gila Bend, University of Arizona, and the Arizona Game and Fish Department.

SECTION 2
LAND MANAGEMENT PRACTICES

Section 2 is intended to provide a description of the proposed construction and post construction practices associated with the development and operation of the plant. The Land Management Plan Map (Figure 1) should be referenced in conjunction with this section.

PROJECT AREA

The plant site is situated on lands (640 acres) bordered by Citrus Valley Road to the east and Sisson Road to the north. Approximately one-half of this area (north and east of the plant site itself) is located within the 100-year floodplain (U.S. Corp of Engineers Flowage Easement). The upland portions of this unit are characterized by Sonoran Desert scrub. In the lowland/floodplain areas and washes, desert riparian scrub (predominantly tamarisk) is found. The proposed plant, located on a 120-acre site within this unit, will include an access road on the southern perimeter (extension of Watermelon Road in conjunction with the Town of Gila Bend), cooling water evaporation ponds, a dedicated storm water evaporation pond, turbines, cooling tower, switchyard, transmission lines, and an administration facility.

LAND MANAGEMENT PRACTICES

The intent of land management practices for the Project include (1) limiting areas of disturbance, (2) protecting major drainages, (3) preserving the present vegetation where possible, (4) enhancing areas of upland vegetation (including transplanting), and (5) providing for areas of screening and long-term access consistent with the Town of Gila Bend General Plan.

In the zone of immediate plant construction, activities will be confined to the 120-acre site area (excluding access) as shown in Figure 1. The construction lay-down and staging area will be centrally located between the southeastern evaporation pond and the planned substation site. Within the 120-acre site, stands of mature Sonoran Desert and/or riparian scrub will be clearly flagged for salvage and transplanted in the general areas as indicated on Figure 1 (where possible). Prior to beginning construction activities, Section 404 and 401 permits will be obtained for disturbance to ephemeral washes on site.

Areas outside of the immediate plant construction zone will be conserved, including the eastern portion of this unit, which has been planned accordingly as open space consistent with the Town of Gila Bend General Plan. In addition, vegetation enhancement measures will be implemented along Citrus and Watermelon roads.

PRESERVED OPEN SPACE AND HABITAT

The intent of land management practices in this area includes:
· Limit areas of disturbance.
· Preserve the existing vegetation where possible.
· Integrate with Town of Gila Bend open space planning (where appropriate).

UPLAND AREAS

The intent of land management practices in this area includes:
· Limit areas of disturbance.
· Preserve the existing vegetation where possible.
· Transplant and/or enhance selective areas.
· Provide for screening consistent with the Town of Gila Bend General Plan.
· Integrate with Town of Gila Bend open space planning (where appropriate).

PLANT SITE AREA

The intent of construction and land management practices in this area includes:
· Limit areas of disturbance.
· Centrally locate the construction lay-down and staging area.
· Clearly flag areas for avoidance and plant material selection for salvage and transplanting to upland areas.
· Integrate access with Town of Gila Bend General Plan (industrial uses).

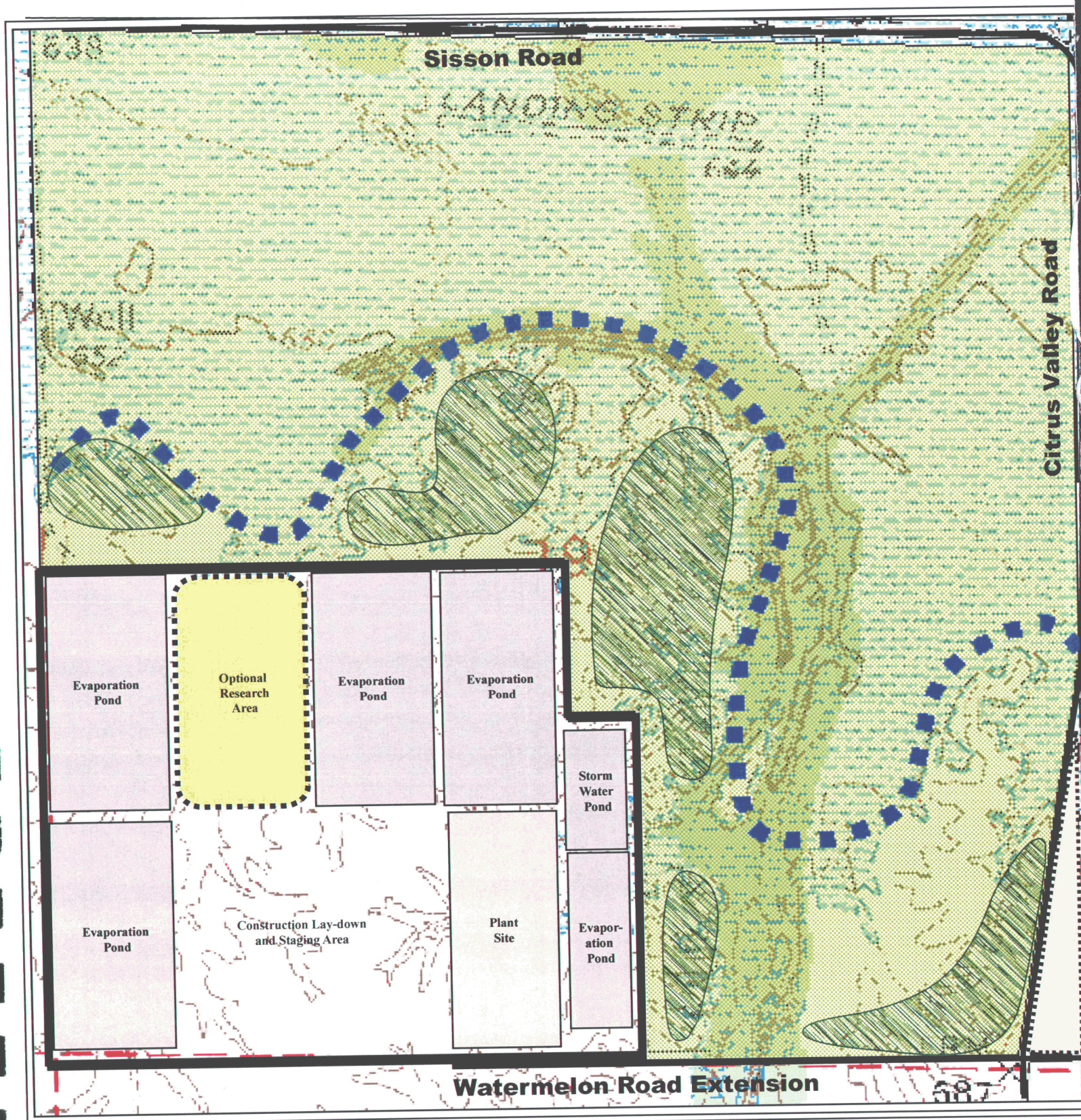
FUTURE LIGHT INDUSTRIAL AREA

· The intent of this area is to allow for future light industrial development consistent with the Gila Bend General Management Plan.

100 YEAR FLOOD PLAIN AND USCOE EASEMENT

GILA BEND
Power Partners, L.L.C.

FIGURE 1



LAND MANAGEMENT PLAN

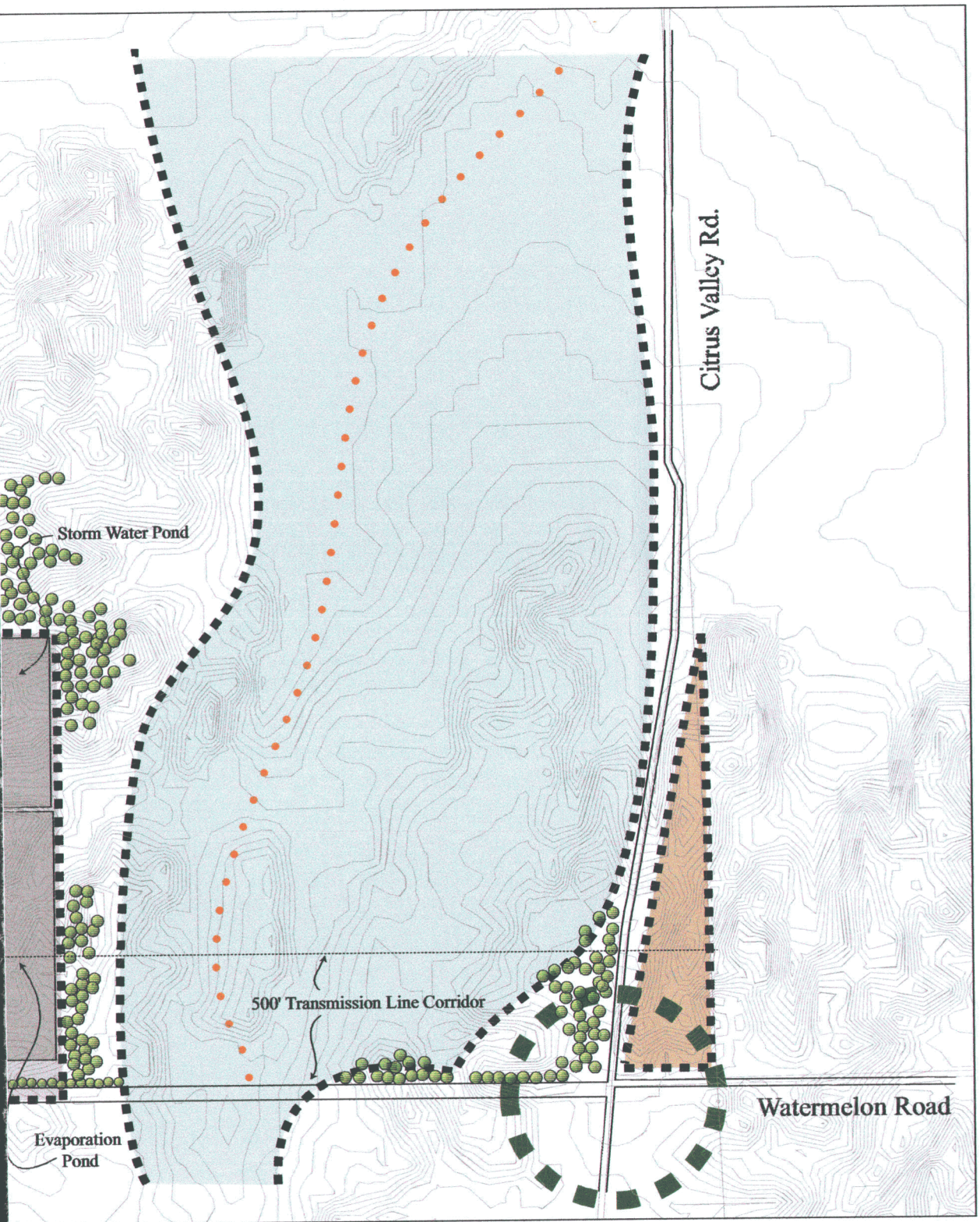
Gila Bend Power Project

0 500 1000 2000'

As described above, the Project's proposed LMP is focused on the uplands portion of the immediate project site including areas beyond the 100-year flood zone and the U.S. Corp of Engineers flowage easement. Currently, the property in these lower lying areas is predominantly vegetated with tamarisk (salt cedar). At the request of the Arizona Power Plant and Transmission Line Siting Committee, GBPP contacted both the University of Arizona (Office of Arid Lands Studies) and the Arizona Department of Game and Fish to enquire about the best management practices for this area. Based on these discussions (see Section 4) GBPP has set aside an optional research area location. The optional area identified for these studies encompasses approximately 20 acres along a pre-selected drainage as indicated on Figure 1.

SECTION 3 – PRELIMINARY SITE PLAN

Landscape concepts for the plant site area that have been initially developed are consistent with proposed land management practices described earlier. These concepts support the Town of Gila Bend General Plan, and will be refined with the Town and submitted for final site plan approval (see Section 4). The preliminary site plan proposed for the plant site area is shown on Figure 2.



DRAFT 12/15/00

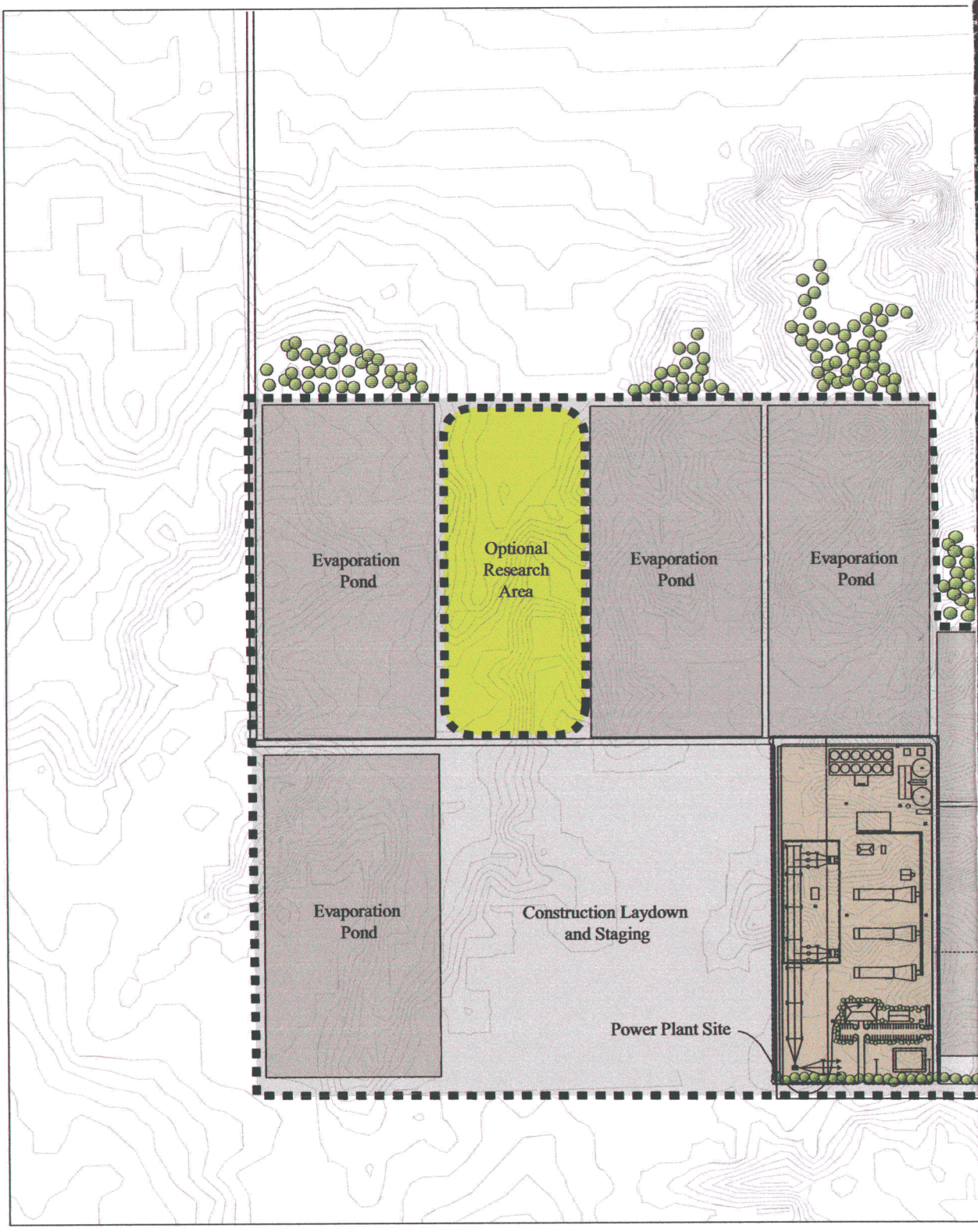
Upland Planting Areas

Optional Research Area

Focal Area

Existing Trail

FIGURE 2



SITE PLAN

Gila Bend Power Project

0 200 400

Legend:

- Plant Site
- Designated Open Space
- Future Light Industrial

SECTION 4 – LETTERS

This section includes letters from the Town of Gila Bend, University of Arizona, and the Arizona Game and Fish Department.

TOWN OF GILA BEND

The Heart of Arizona

December 13, 2000

Industrial Power Technology
Tom Shelton
2227 Capricorn Way, Suite 101
Santa Rosa, CA 95407

Mr. Shelton;

It was my pleasure to have met with Randy Palmer from Environmental Planning Group (EPG), to discuss the preliminary site plan for your power plant project. I was particularly pleased with the level of sensitivity regarding the Town's interests that was displayed by all the discussion participants.

With the exception of a couple of questions still left to be answered, I left the meeting with a very good feeling about the site plan presented for your project and am confident the we are moving in a positive and mutually advantageous direction.

Please understand that you have continuous support from the Town Administration as well as the general public. It is my hopes that like this past meeting, as we meet in the future that designs and plans will represent the future well being of the community as a whole. Thank you for your time and attention to matters that mean the most to our community.

Sincerely,

Shane Dille
Town Manager

Cc: Randy Palmer (EPG)

F:\all\Corr\PowrDevSiteSupport.doc

Office of Arid Lands Studies

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

1955 E. Sixth Street
Tucson, Arizona, 85719-5224
Telephone: (520) 621-1955
FAX: (520) 621-3816
The OALS Home Page (WWW)
http://ag.arizona.edu/OALS/oals.html

December 14, 2000

Mr. Tom Shelton
Gila Bend Power Partners, L.L.C.
5949 Sherry Lane--Suite 1880
Dallas TX 75225

VIA FAX: 602-956-4374

Dear Mr. Shelton:

We have reviewed your request for technical assistance with your project near Gila Bend and your restoration concerns. We believe that controlling salt cedar in order to be able to restore native species is an extremely difficult problem. There have been and continue to be efforts to control this very aggressive species and most of these efforts have had very mixed results at best.

I have discussed this issue with other researchers here at the university. We believe that although the eradication of salt cedar is very difficult if not impossible, especially in an area that is surrounded by extensive dense stands of salt cedar trees that are prolific seed producers, it may be possible to achieve success under the right approach. Progress is being made in new methodologies for salt cedar control and riparian system restoration. The key to success at your site will not necessarily be the removal of the existing salt cedar, but the ability of newly-established vegetation to resist being outcompeted by the salt cedar.

We feel that it may be beneficial to fully evaluate the current state of knowledge and to apply this knowledge to test plots at the site before deciding how to best deal or not deal with the salt cedar at your site.

We would be agreeable to putting a University of Arizona team together to assist in this effort. Please contact me (520-621-8589) if I can answer any questions.

Very truly yours,

Martin M. Karpiscak
Associate Research Scientist

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • WWW.AZGFD.COM

GOVERNOR
JANE DEE HULL
COMMISSIONERS
CHAIRMAN, W. HAYS GILSTRAP, PHOENIX
DENNIS D. MANNING, ALPINE
MICHAEL M. GOLIGHTLY, FLAGSTAFF
JOE CARTER, SAFFORD
WILLIAM BERLAT, TUCSON
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

December 14, 2000

Mr. Gary H. Bacon
Malcolm Pirnie, Inc.
432 North 44TH Street, #400
Phoenix, Arizona 85008

Re: Gila Bend Power Generating Station

Dear Mr. Bacon:

The Arizona Game and Fish Department (Department) has received your letter, dated December 12, 2000, requesting our involvement in the land management planning process associated with the Gila Bend Power Generating Station Project. Based on the information you provided during our telephone conversation, the Department would appreciate the opportunity to provide technical assistance and to explore the opportunity for a partnership to develop some type of habitat enhancement project in the future.

To clarify our discussion, we believe that riparian areas or washes dominated by salt cedar may provide habitat for some wildlife species, but in no way replaces the habitat values associated with native riparian or wash vegetation (e.g., cottonwood-willow and mesquite bosque). However, it is important to note that federal and state land management agencies have had difficulty in permanently removing this species from many watersheds in the West. If your client decides to implement such a project within the 100-year floodplain, we recommend contacting the U.S. Army Corps of Engineers for additional information regarding the Clean Water Act and how it may apply to this project.

Again, the Department would be interested in visiting the project site to provide some assistance in identifying a potential habitat restoration project. Please contact me at (602) 789-3605 if you have any questions.

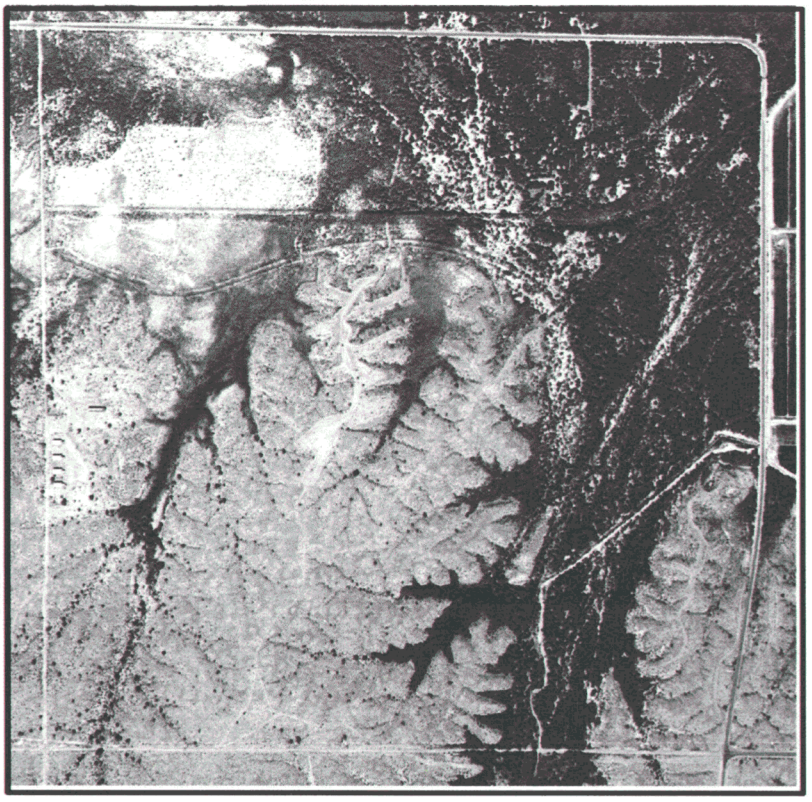
Sincerely,

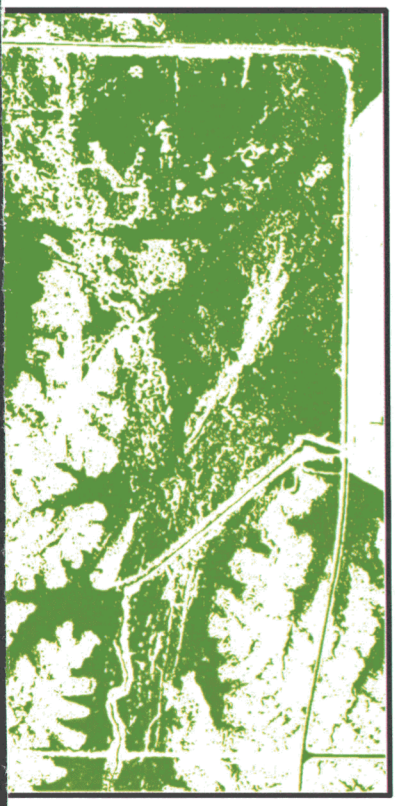
Bob Broscheid
Project Evaluation Program Supervisor

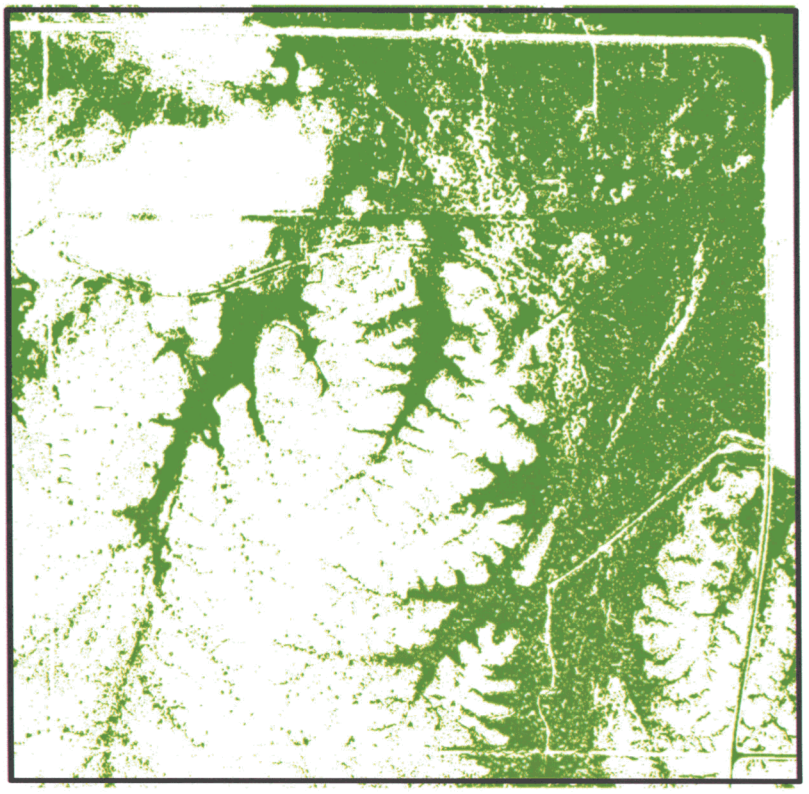
cc: Russ Engel, Habitat Program Manager, Region IV, Yuma
Dave Conrad, Field Supervisor, Region IV, Yuma

EXHIBIT

A-9
admitted

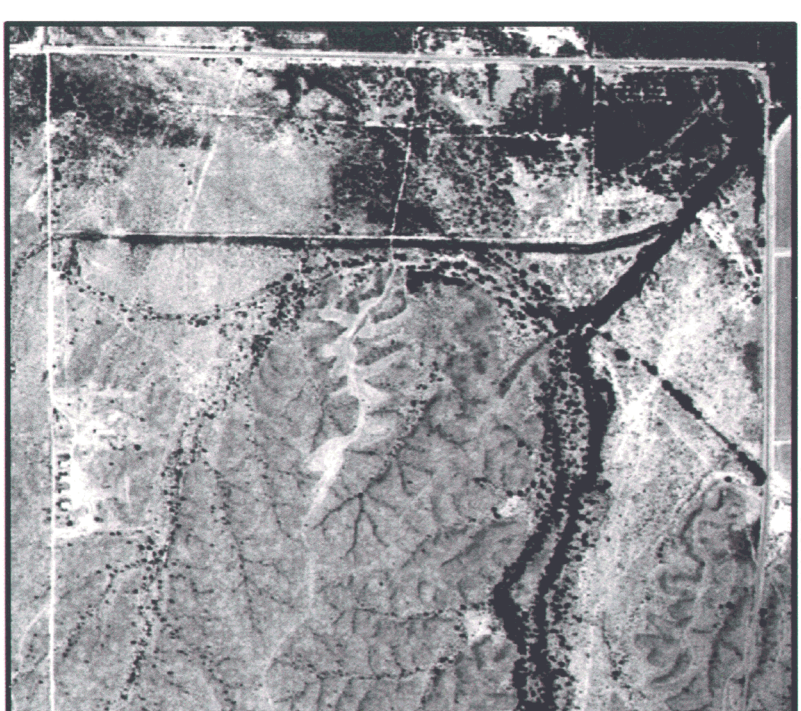


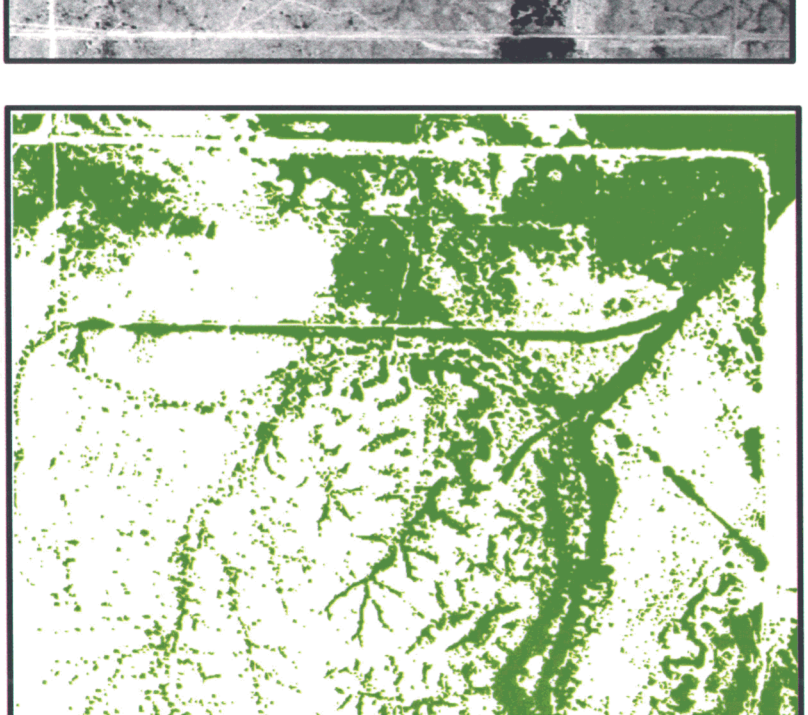


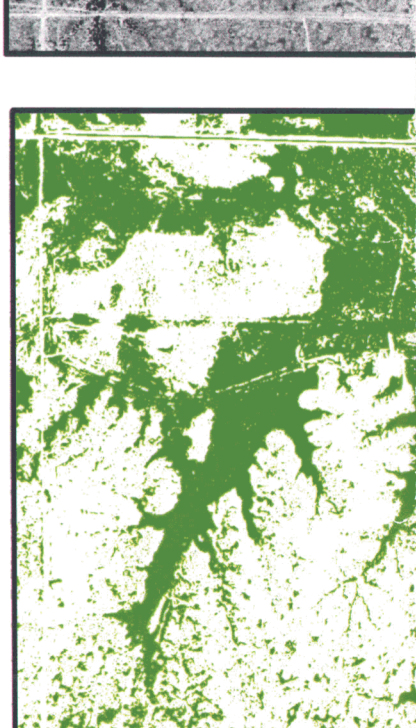


6

2000







1986

19

GILA BEND POWER PROJECT
VEGETATION CLASSIFICATION

EXHIBIT
C-1
admitted

ARIZONA DEPARTMENT OF WATER RESOURCES

HYDROLOGY DIVISION

M E M O R A N D U M

TO: Power Plant and Transmission Line Siting Committee

THROUGH: Greg Wallace, Chief Hydrologist
Arizona Department of Water Resources

Dennis Sundie, Siting Committee Member

FROM: Dale Mason, Supervisor
Groundwater Modeling Section
Hydrology Division

DATE: December 13, 2000

RE: Hydrologic Review of Gila Bend Power Partners Power Plant Application, A.C.C. Docket No. L-00000V-00-0106

This review consists of two sections; the first section contains general background information about the proposed plant site, an analysis of historic water level trends, and pumpage records for the area around the proposed plant site. The second section is a review of the hydrologic analysis of potential water level impacts on the regional aquifer from plant pumpage submitted by the applicant.

General Background Information

1. Plant Site

The proposed plant site is located in Section 19 of Township 5 South, Range 5 West, which is in the northern part of the Gila Bend groundwater basin. The nearest city, Gila Bend, Arizona, is located about six miles east of the proposed site. The Gila River is located about one mile north of the proposed site and is a major source of recharge to the regional aquifer in the Gila Bend basin. The plant site is in an agricultural area, however, agricultural activity in the area surrounding the plant site has declined since the early-1990s. The agricultural lands around the plant contain numerous irrigation wells, some of which have water level records dating back to the early 1950's. Current water levels in wells around the proposed plant site range from 60 to 100 feet below land surface and the direction of groundwater flow is generally to the south-southeast away from the Gila River.

Hydrologic investigations in the Gila Bend basin include the following: Babcock and Kendall, 1948; Cahill and Walcott, 1955; Johnson and Cahill, 1955; Heindl and Armstrong, 1963; Sebenik, 1981; and Rascona, 1995. Most of the information for these investigations was gathered following major flood events. The Department conducted a water level sweep of the Gila Bend basin in the fall of 1993, following the floods of January-February 1993. The data gathered during the 1993 water level sweep was incorporated into a Hydrologic Map Series (HMS) report published by the Department (Rascona, 1995). The Department measures water levels annually in selected wells throughout the state. These wells, called index wells, are used to identify long-term trends in water levels. The Department has 33 index wells located in the Gila Bend basin, one of which is located approximately one mile east of the plant site (Figure 1).

2. Historic Water Level Trends

The earliest water level records for the area around the proposed plant start in the early 1950s. Unfortunately, no individual well near the proposed plant site has a continuous water level record from the 1950s to the present. Since the 1950s, recorded water levels in wells near the proposed plant site have ranged from 50 to 110 feet below land surface. The fluctuation in water levels through time is the result of changes in the relative amounts of groundwater pumpage and surface-water recharge in the Gila Bend area. From the mid-1950s to the mid-1970s, local water levels steadily declined. During this time groundwater pumpage generally exceeded recharge from surface water flows in the Gila River (Rascona, 1995) (Figure 2). Beginning in the late-1960s, a series of large flood flows occurred in the Gila River (Figure 3). Surface water recharged into the regional aquifer from these flood flows exceeded groundwater pumpage and several periods of water levels recovery occurred during the mid-1970s through the mid-1990s (Rascona, 1995).

The water level index well C-05-05 20dcd, located about one mile east of the proposed plant site, shows the pattern of rising and falling water levels mentioned above (Figure 1). This well had a water level recovery of about 35 feet from the late 1970s to the mid-1980s. Water levels then declined during the late-1980s and early-1990s. A major flood event in 1993 caused water levels to recover about 45 feet. Since the 1993 flood, groundwater pumpage has again exceeded surface water recharge and water levels in the well have been declining between 1 and 2 feet per year.

3. Groundwater Pumpage

Groundwater pumpage for agricultural development in the Gila Bend basin began in the early 1930s. The groundwater supplements surface water diverted from the Gila River at Gillespie Dam. Gillespie Dam was completed in 1921 and diverted surface flows into the Gila Bend and Enterprise Canals. A 150 foot-wide section of the dam was breached during the flood of January-February 1993. Currently, surface water is pumped into the Gila Bend and Enterprise Canals from behind the dam. The Gila Bend basin is not in an Active Management Area, therefore, groundwater pumpage is not required to be reported to the Department. However, the

U. S. Geological Survey has compiled groundwater pumpage estimates for the basin (Figure 4).

Water Level Impact Analysis

1. Projected Plant Water Use

At maximum generating capacity, the proposed plant is expected to use between 7,000 and 10,000 acre-feet per year. The hydrologic report does not contain any plans for construction of a well field for the plant. There are at least eight large diameter wells in sections 18 and 19, which would be able to supply the plant with cooling water. However, no plan is presented in the hydrologic report that details if, or how, these wells may be utilized.

Agricultural activity in the area surrounding the plant site has declined since the early-1990s. The power plant is expected to use about the same or slightly less groundwater water than was historically used for agriculture (Gila River Power Partners, 2000). Therefore, total water demand for the area near the plant is not expected to increase over historic levels.

2. Well Impact Analysis

Hargis + Associates developed an analytical groundwater flow model to evaluate the potential impacts of groundwater pumpage from the plant on the regional aquifers. The analytical model uses the Theis equation to calculate the maximum drawdown and the extent of the drawdown on the aquifer. The well impact analysis used reasonable values for aquifer conductivity and storage. The aquifer conductivity value was calculated from the results of an aquifer test preformed on an existing well on the site. The conductivity value from this test is consistent with results from other aquifer test data in the northern Gila Bend basin.

Four different pumping scenarios were simulated using the analytical model. Each of the four scenarios was run for 50 years to analyze aquifer impacts over the projected life of the plant. The four simulations and their results are summarized below.

- Power Plant Scenario 1: This scenario simulated the pumpage for the Gila Bend Power Partners (GBPP) and Panda Gila River Project (PGRP) over 50 years. The GBPP plant pumpage was 7,000 acre-feet per year and the PGRP plant pumpage was 10,000 acre-feet per year. The hydrologic parameters used for this scenario were a conductivity of 20 feet per day and an aquifer storage value of 12%. Maximum drawdowns calculated in this scenario were between 60 and 80 feet, and annual drawdowns were projected to be 1 to 1.5 feet near the two power plants.

- Power Plant Scenario 2: Scenario # 2 was run using the same pumpage for the two power plants as in scenario 1, but the aquifer storage value was lowered to 5%. The maximum drawdowns for this simulation are 70 to 90 feet after 50 years, and water level declines are projected to be 1.5 to 2 feet per year near the power plants.

- Power Plant and other background Pumpage Scenario: This pumpage scenario simulated the power plant pumpage, plus municipal pumpage for Gila Bend of 1,400 acre-feet per year and agricultural pumpage for Paloma Ranch of 18,400 acre-feet per year for 50 years. This is considered a worst case pumpage scenario. The hydrologic parameters used in this scenario were a conductivity of 20 feet per day and an aquifer storage value of 12%. Maximum drawdowns are between 100 and 110 feet after 50 years. Projected drawdowns may be between 2 and 2.2 feet per year.

- The fourth scenario is the same as the third, except that the aquifer storage value is again lowered to 5%. The results of this scenario show that after 50 years drawdowns near the power plants will be between 110 and 120 feet. Projected annual drawdowns may be between 2 and 2.5 feet per year

Conclusions:

Pumpage to supply the Gila Bend Power Partners Plant will have significant short-term impacts on water levels in the local aquifer. However, the plant should not have an adverse, long-term impact on the local aquifer. Historically, water levels in the Gila Bend area close to the Gila River have displayed a cyclic pattern of declines followed by recovery. The rising and declining cycles are directly related to the amount of recharge supplied to the aquifer from surface water flows in the Gila River and the amount of groundwater pumpage from the aquifer. During periods of low surface-water flows, water levels generally decline because local pumpage exceeded surface water recharge. During times of larger than normal surface-water flows, water levels rise because surface water recharge exceeds local pumpage.

The most likely effect on the local aquifer of the GBPP power plant will be to increase water level decline rates in and near the plant site during periods of normal or low river flows. Water level decline rates projected by model simulations (1 to 2.5 feet per year) can be combined with current decline rates (1 to 2 feet per year) for an approximation of potential future water level decline rates.

References:

Anning, D.W. and Duet, N.R., 1994, Summary of Groundwater Conditions in Arizona, 1987-90. U.S. Geological Survey Open-File Report 94-476.

Babcock, H. M. and Kendall, K. K., 1948, Geology and ground-water resources of the Gila Bend basin, Maricopa County, Arizona, with a section on quality of water by J. D. Hem: U.S. Geological Survey open-file report, 26 p.

Cahill,J. m. and Wolcott, H. N., 1955, Further investigations og the ground-water resources of

the Gila Bend and Dendora areas, Maricopa County, Arizona: U.S. Geological Survey open-file report (unnumbered), 9 p., 4 fige., 2 tables, 2 plates.

Gila Bend Power Partners, 2000, Application for Certificate of Environmental Compatibility, Prepared for the State of Arizona Power Plant and Transmission Line Siting Committee.

Heindl, L. A. and Armstrong, C. A., 1963, Geology and ground-water conditions on the Gila Bend Indian Reservation, Maricopa County, Arizona: U. S. Geological Survey Water-Supply Paper 1647-A, 48 p.

Johnson, P. W. and Cahill, J. M., 1955, Ground-water resources and geology of the Gila Bens and Dendora areas, Maricopa County, Arizona: U.S. Geologic Survey open-file report 53 p.

Rascona, 1995, Maps showing groundwater conditions in the Gila Bend Basin, Maricopa County, Arizona – 1993. Arizona Department of Water Resources, Hydrologic Map Series Report Number 29.

Sebenik, P.G., 1981, Maps showing groundwater conditions in the Gila Bend Basin, Maricopa County, Arizona – 1979. Arizona Department of Water Resources, Hydrologic Map Series Report Number 3.

U. S. Geological Survey, 1997, Water Resource Data Arizona Water Year 1997, Water-Data Report AZ-97-1, 416 p.

U. S. Geological Survey, 1998, Water Resource Data Arizona Water Year 1998, Water-Data Report AZ-98-1, 463 p.

Figure 1.

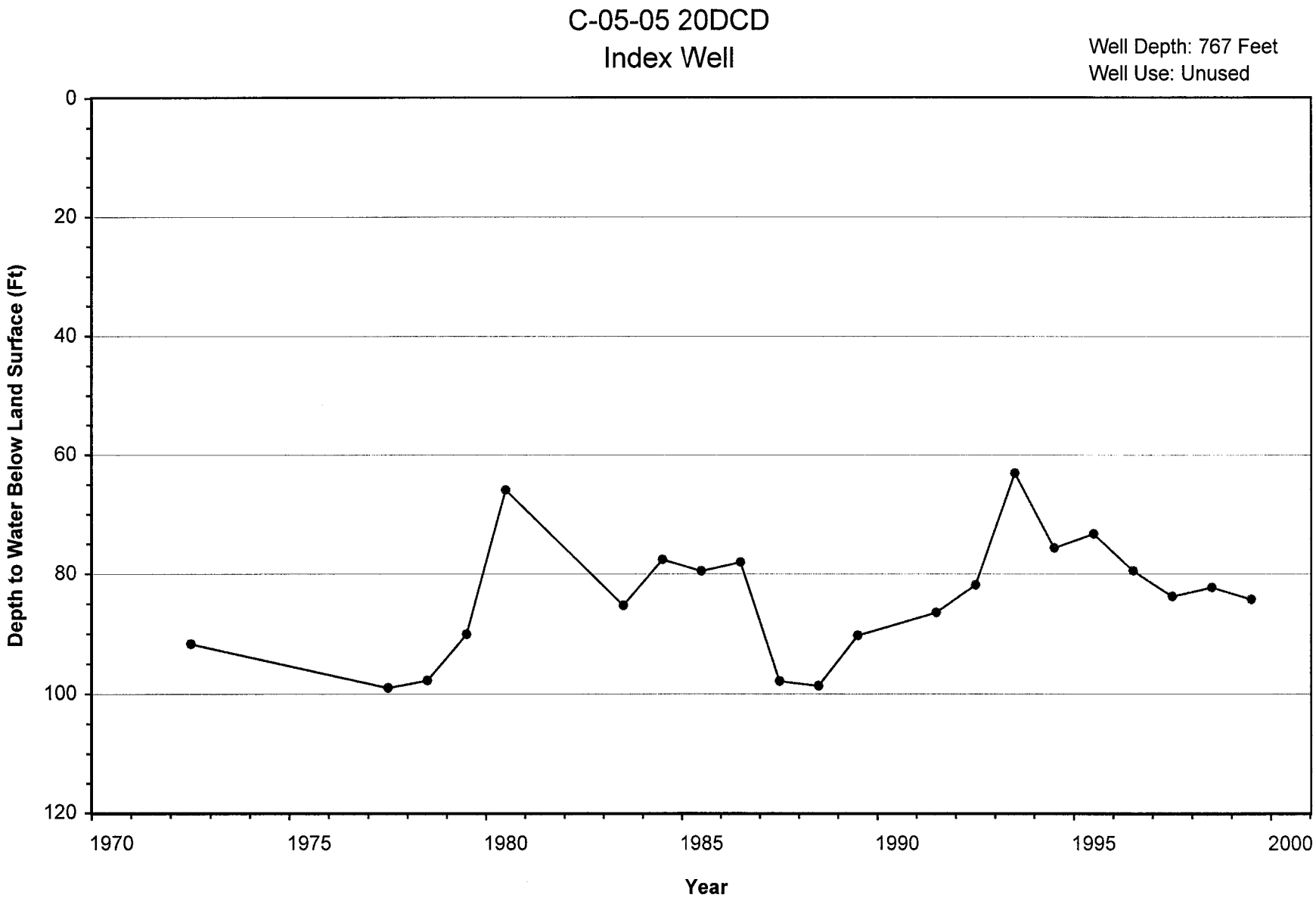

C-05-05 20DCD
Index Well
Well Depth: 767 Feet
Well Use: Unused
Depth to Water Below Land Surface (Ft)
0
20
40
60
80
100
120
1970
1975
1980
1985
1990
1995
2000
Year

Figure 2.

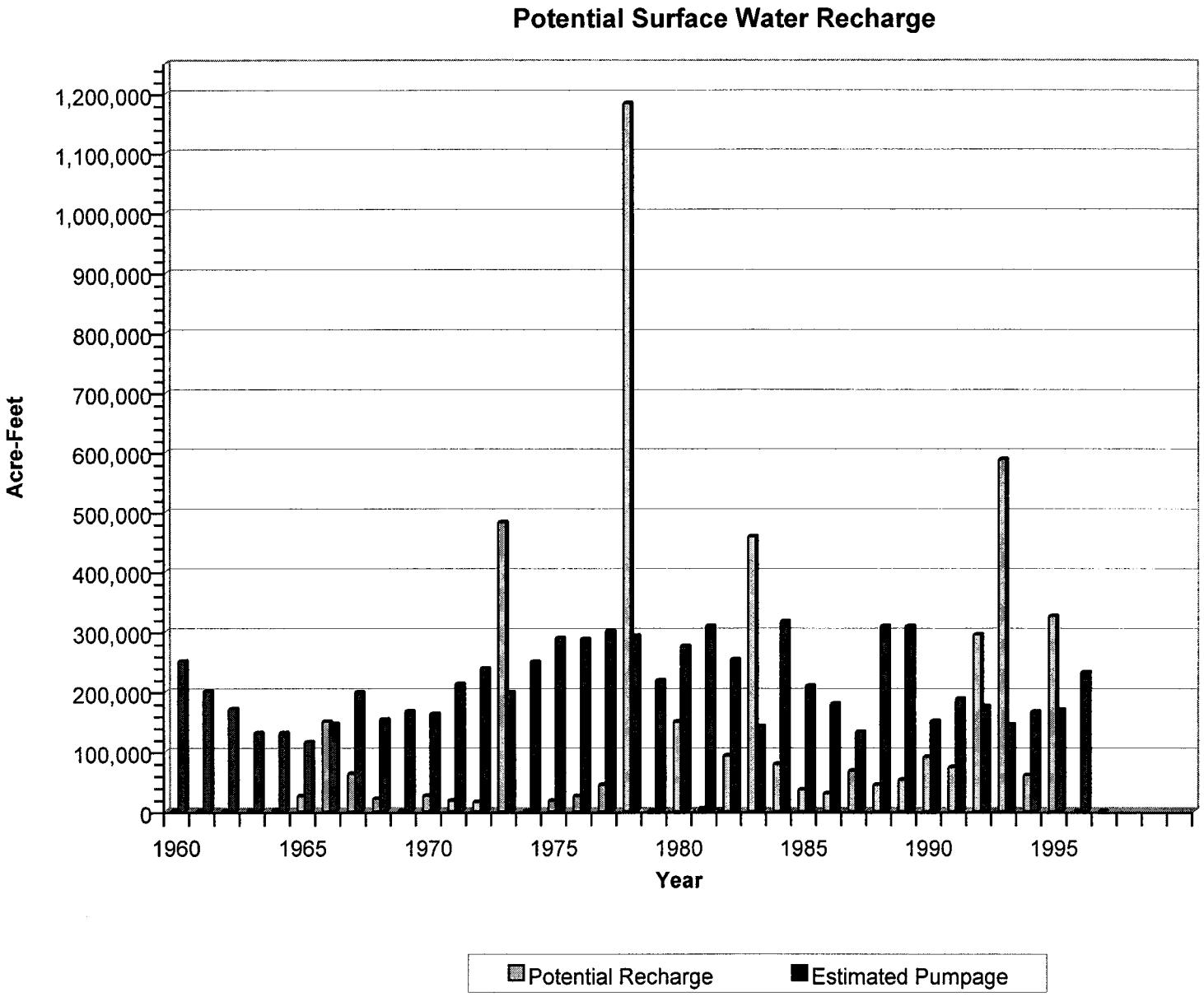

Potential Surface Water Recharge
Acre-Feet
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
0
1960
1965
1970
1975
1980
1985
1990
1995
Year
Potential Recharge
Estimated Pumpage

Figure 3.

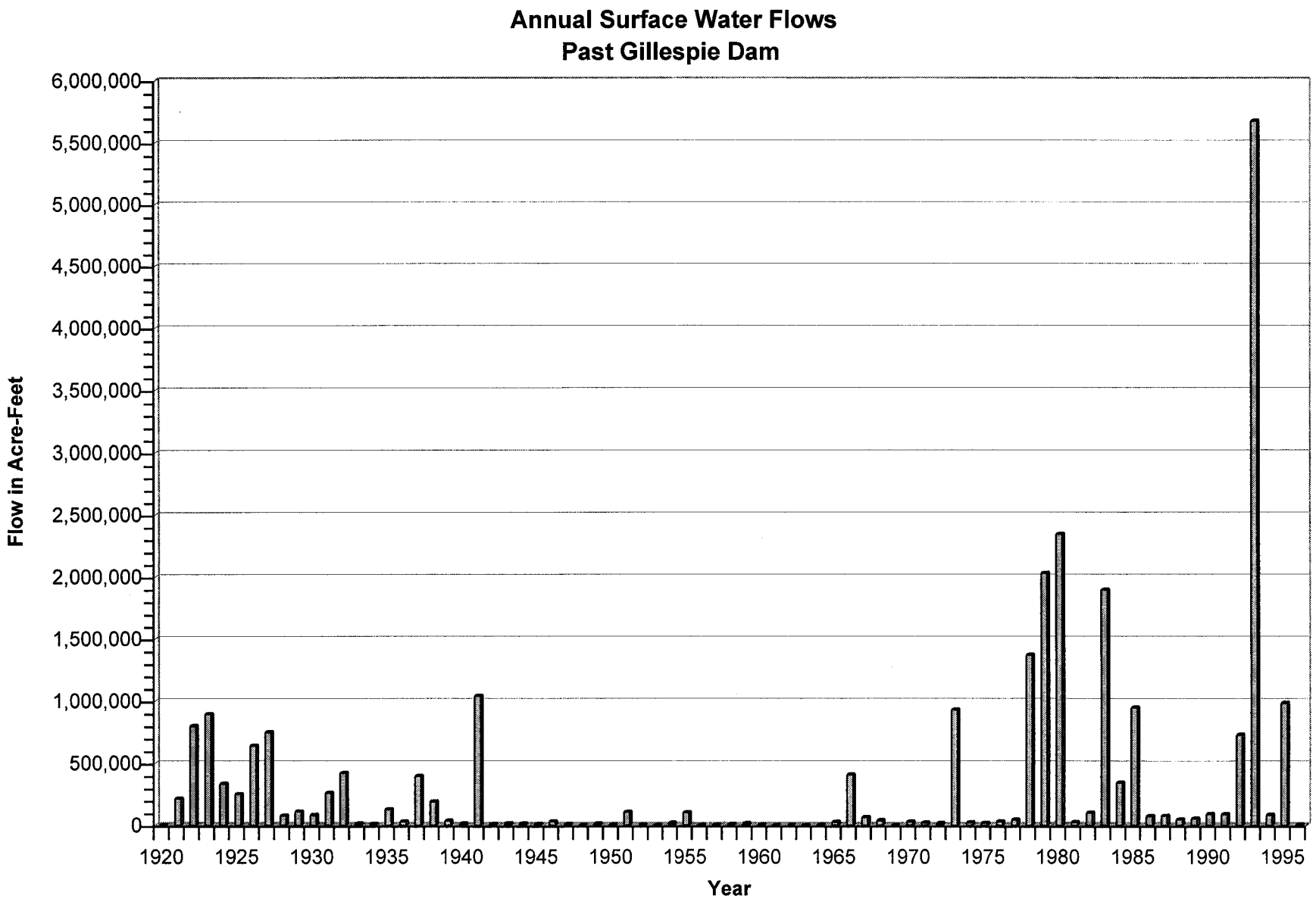
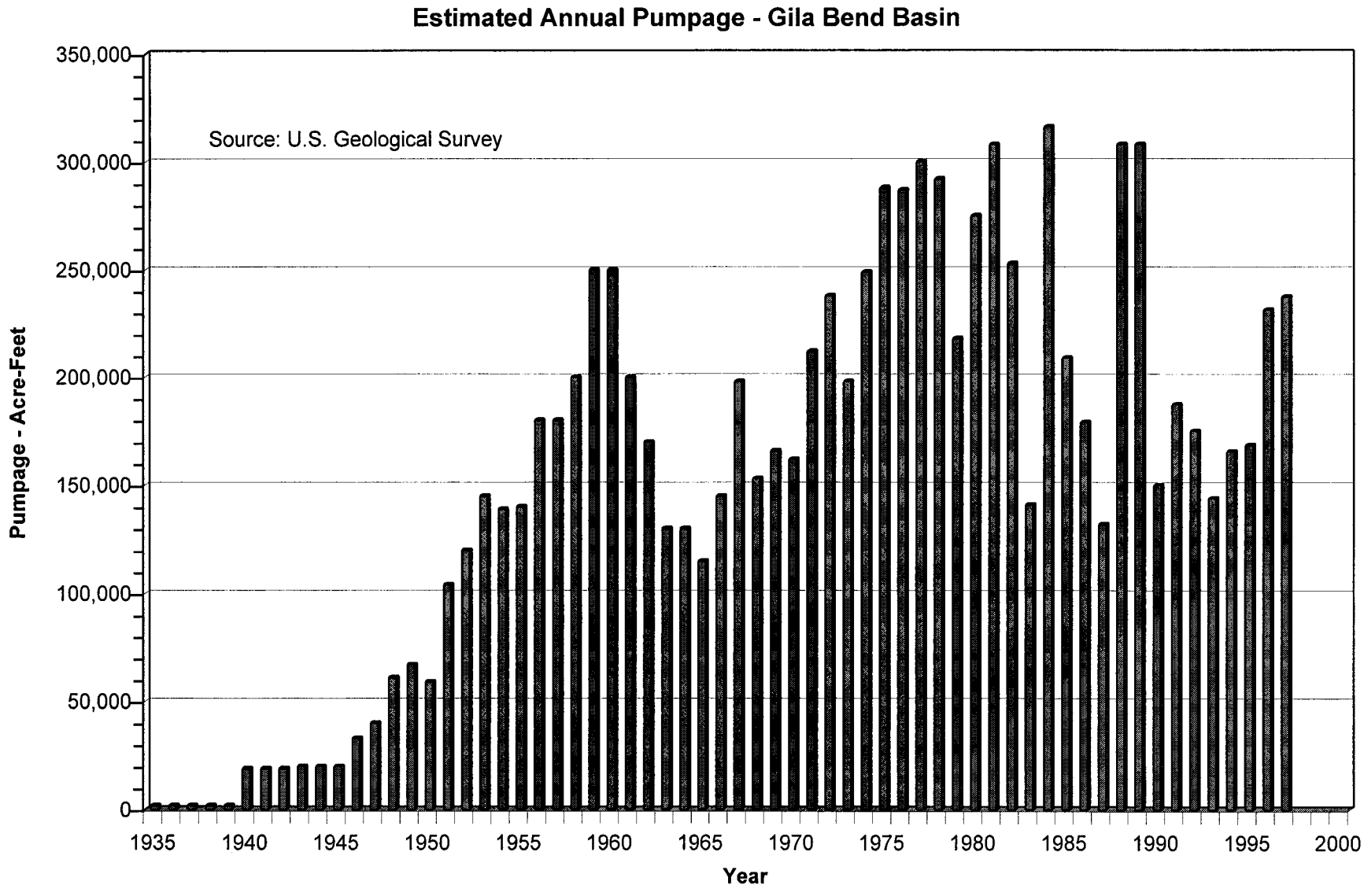
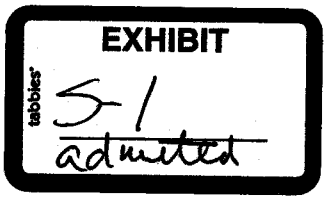

Annual Surface Water Flows
Past Gillespie Dam
Flow in Acre-Feet
6,000,000
5,500,000
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
Year

Figure 4


Estimated Annual Pumpage - Gila Bend Basin
Source: U.S. Geological Survey
Pumpage - Acre-Feet
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
Year



BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF GILA BEND POWER PARTNERS, L.L.C., OR THEIR ASSIGNEE(S), IN CONFORMANCE WITH ARIZONA REVISED STATUES 40-360.01 ET SEQ., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF A NATURAL GAS-FIRED, COMBINED CYCLE GENERATING FACILITY, SWITCHYARD, AND RELATED FACILITES IN THE TOWN OF GILA BEND, MARICOPA COUNTY, ARIZONA LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 5 SOUTH, RANGE 5 WEST, GILA AND SALT RIVER BASE AND MERIDIAN.	CASE NO. 106 DOCKET NO. L-00000V-00-0106

COMMENTS

OF

JERRY D. SMITH

ELECTRIC UTILITIES ENGINEER

ARIZONA CORPORATION COMMISSION STAFF

NOVEMBER 9, 2000

PURPOSE OF COMMENTS

Jerry D. Smith, representing Arizona Corporation Commission Staff ("ACC Staff" or "Staff"), offers the following comments regarding the Gila Bend Power Partners, LLC ("Applicant") application for a Certificate of Environmental Capability ("CEC") authorizing construction of a 845 MW, natural gas-fired, combined cycle power plant and switchyard. The fundamental issue raised by this document is the reliable production and delivery of energy from this plant. Mr. Smith offers support data relative to Staff's position that multiple lines are required out of power plant switchyards and proposes a new switchyard stipulation.

It is both proper and prudent for ACC Staff to ascertain the reliability implications of the Applicant's project as a matter of record in a Siting Committee hearing of Applicant's case. Paragraph B of A.R.S §40-360.07 requires the ACC to balance in the broad public interest the need for an adequate, economical and reliable supply of electric power with the desire to minimize the effect on the environment and ecology of this state. The Siting Committee hearing is the only legal forum by which Staff can establish its record for ACC consideration.

Mr. Smith's comments reflect his due consideration of the Gila Bend Power Plant project from two perspectives. He has considered how the proposed power plant will deliver its energy over existing and planned transmission facilities to consumer markets. Mr. Smith's extensive knowledge of the Arizona electric system stems from twenty-seven years of employment by SRP. That career afforded him the opportunity to study, plan, and site generation and transmission projects in the state of Arizona. Mr. Smith has also considered the project from the context of his present ACC Staff responsibilities. He is currently charged with enabling and facilitating Arizona's transition to a competitive, reliable and adequately robust electric energy market.

ARIZONA BEST ENGINEERING PRACTICES

Staff has researched and documented the best utility practices of electric utilities that have constructed, owned, and operated power plants within the state of Arizona. On July 19, 2000, Staff formally made a data request of AEPCO, APS, SRP, TEP and WAPA to supply one-

line diagrams for each power plant transmission switchyard for which their company was an owner, project participant, or transmission service provider. They were asked to include existing facilities as well as any having an approved CEC. Their responses are summarized in Tables 1 and 2. Copies of one-line diagrams provided by utilities in response to this data request are available from Staff upon request.

The 21 power plants presently located in Arizona consist of 80 generating units of various sizes totally 15,935 MW in capacity. Arizona utilities own 73% of this capacity (11,708 MW). The remaining capacity is owned by utilities located in other states. I have taken the liberty to include the Four Corners and San Juan power plants in this data even though they are physically located just east of the Arizona / New Mexico state line and because they play a prominent role in the energy supply and delivery requirements of this state.

Of the 80 generating units located in Arizona only 5 units have fewer than 3 transmission lines or transformer ties emanating from their switchyard. The 13 MW Stewart Mountain hydro unit and the 36 MW Roosevelt hydro unit are shown as having only one line in Table 1. However, the Roosevelt unit is actually connected to Frasier Substation via a single generator tie approximately 2 miles in length while the Stewart Mountain unit is connected to Goldfield Substation via a generator tie approximately 8 miles in length. Multiple lines and transformer ties are terminated at both Frasier and Goldfield. From this data it is evident that utility practices in Arizona have resulted in "two or more transmission lines or transformer ties emanating from all power plant transmission switchyards."

In Staff's data request, utilities were also asked to identify what criteria was used to establish the bus configuration and the number of transmission lines required out of each power plant. The utilities' responses indicate that the units outlined in Table 1 have been installed over a large range of years. As one would expect, the switchyard designs have changed over the years. Therefore, the bus configuration and number of transmission lines have been established for each unique power plant situation.

As a general practice, the utilities have designed all facilities in Table 1 in accordance with the applicable WSCC / NERC criteria in existence at the time of construction. Generally,

the transmission system must perform in such a manner that loss of one component will not overload any other component and voltages will remain at acceptable levels. However, no specific criterion has dictated the choice of bus configuration. Nor has the industry had specific criteria addressing the minimum number of lines required out of a power plant. Beyond the applicable WSCC / NERC criteria, the bus configuration and number of lines out of a plant's switchyard have been a discretionary decision driven by a utility's consideration of prevailing planning, engineering, design, operation and business practices.

In addition, utilities were asked to identify any criteria they use to establish the bus configuration and number of lines required out of a switchyard when a party seeks an interconnection. The utilities' responses indicate that no criteria exists that specifies the bus configuration or number of lines required out of a power plant switchyard for requested interconnections. They do however, rely on WSCC and NERC policies and criteria when responding to new interconnection requests.

The above facts substantiate the appropriateness of the "Guiding Principles for ACC Staff Determination of Electric System Adequacy and Reliability" used as the foundation for Staff's testimony and recommended Siting Committee conditions in prior power plant hearings. Staff's position on bus configuration and number of lines required out of a power plant switchyard is truly based on undisputed "best engineering practices" established by utilities in Arizona over the course of many years of accountability for the reliable supply and delivery of energy to Arizona's consumers.

Restructuring the Arizona electric industry for retail competition via a deregulated energy market is no justification for relaxing the best engineering practices established by utilities in Arizona. To do so, would jeopardize the present electric service reliability cherished by Arizona's consumers. It would simply allow a greater financial gain for merchant power plants. Neither WSCC nor NERC are contemplating relaxing their reliability criteria. In fact, there is considerable political pressure to strengthen national reliability requirements in response to the wide spread concern about blackouts that are becoming more prevalent throughout the nation.

Currently, no merchant power plant exists in Arizona. But Table 2 reveals that Arizona is under going a major shift in its ownership and operation of power plants. All but two of the 14 proposed plants will be merchant plants or owned and operated by an affiliate of an ACC regulated utility. These 14 plants consist of 36 new combined cycle units or combustion turbines with an aggregate capacity of 12,520 MW. This is equivalent to the existing load in the state of Arizona and roughly one third greater then the load growth projected for the Desert Southwest region over the next decade as reflected in Figure 1.

Half of the proposed plants have an ACC decision approving their CEC with conditions. An eighth plant has Siting Committee approval and is awaiting ACC action. Staff's intervention in siting cases commenced with the PWEC Redhawk hearing.[1] While the PWEC Redhawk project has yet to file a CEC application for its transmission lines, it has committed to two or more lines emanating from the plant. All but one approved plant has two or more transmission lines. In fact, half of the proposed plants, 3 approved plants and 4 plants yet to appear before the Siting Committee, have committed to multiple switchyard lines without Staff intervening. Applicant's Gila Bend Power Plant project is the only proposed project that continues to challenge Arizona's established best engineering practice of multiple lines out of a power plant switchyard.

Staff has consistently taken the position that two or more transmission lines are required out of each plant's switchyard to meet a single contingency "N-1" criteria without relying on remedial action such as generator tripping or load shedding. The evidence in Table 2 is an indicator that there is support of this practice even when Staff is not involved. Now is not the time to relax our reliability standards. It is interesting that all of the projects that have proposed a single transmission line have also sought an interconnection at the Palo Verde satellite switchyard named "Hassayampa." It is at this same location that existing transmission capacity to accommodate those same plants is in question. An update of Palo Verde interconnection study results has been reflected in Figure 2.

...

[1] Docket No. L-00000J-99-0095, ACC Decision No. 62324.

OTHER EXPERT OPINION

Jennifer Tripp of R.W. Beck has given expert testimony during the Santan Generating Station Expansion Project (Case No. 105) hearing that is germane to this Applicant's case. Selected pages of the reporter's transcript of the Santan proceeding occurring October 25, 2000 are attached. Pages 400 and 401 establish Ms. Tripp as an expert witness in the areas of planning, financing, design, and rate making for generating plants and transmission lines. As recorded on page 436, Ms. Tripp responded under oath to cross-examination concerning whether she had studied alternative generating sites.

Ms. Tripp's response was - "We did not examine other sites as part of our study. However, looking at the transmission system, a standard combined cycle plant would require a minimum of three 230 kV lines or two 500 kV lines. And if you want, we could go back to the figure showing the East Valley, and there's just not many sites there. I mean, you can look and see the map, and there's very few where you would not have to build new transmission."

Ms. Tripp's testimony aligns with Staff's conclusions from its investigation of Arizona's Best Engineering Practices regarding the number of lines out of power plants. Her expert testimony serves as further evidence that Staff's position of requiring at least two transmission lines out of new power plants is both reasonable and prudent.

NEW CONCERN

Merchant plant owners appearing before the Siting Committee are filing with FERC for Exempt Wholesale Generator ("EWG") status. This allows them to charge market based prices for their energy production rather than cost based prices. In many cases merchant plants are including the power plant switchyard and single transmission line or transformer tie among their facilities in such EWG applications. This precludes them from being required to have a FERC tariff and transmission rate filed for transmission service. This further removes the power plant projects from the non-discriminatory transmission access requirements at FERC.

The ACC Staff has received feed back from several projects that a cooperative response was not received from another merchant plant owner regarding an inquiry regarding a potential

transmission interconnection to their plant switchyard. Power plant switchyards are historically the location most coveted for efficient transmission interconnections. Allowing merchant plants to deny a request for transmission interconnection is a contradiction to the principle of non-discriminatory transmission access advocated by FERC and state regulatory commissions. Therefore, Staff recommends that an additional provision should be placed on merchant power plant applications that requires them to respond to transmission interconnection requests to their switchyard or transmission line on the same basis as a transmission provider.

STAFF RECOMMENDATION

This Applicant's project is comparable to other plants seeking to interconnect with the Palo Verde transmission system. Staff supports the Gila Bend Power Plant project on the same basis as projects that have proceeded it. Therefore, Staff believes it is both proper and prudent to recommend Siting Committee and ACC approval of a CEC with the standard array of ACC conditions required of other plants. This includes the requirement that two transmission lines or EHV transformer ties interconnect the Applicant's project to the EHV transmission system. In addition, Staff recommends the following new stipulation to ensure non-discriminatory transmission access to EWG facilities:

> **"Applicant or its assignee(s) agrees to respond to inquiries for future transmission interconnections with its facilities in the same nondiscriminatory manner and using the same process as that required of transmission owners and service providers."**

Having given due consideration to the reliability concerns documented herein, Staff does remain concerned about the existing transmission system's inability to reliably deliver the Gila Bend Power Plant energy and other plant's energy to market. In addition, Arizona's siting procedures allow plants and associated transmission projects to file CEC applications in a disjointed fashion. This compromises effective public policy decisions. It may be time to address such global concerns in a Siting Committee and ACC Workshop or Study Session setting. Staff suggests such a forum rather than burdening this hearing with issues not solely related to the Gila Bend project.

The Siting Committee should give due consideration to the above Staff recommendations given the grave consequences at stake in the local electric system. Are rolling blackouts in Arizona a likely consequence of not siting sufficient transmission early enough to get energy from new plants to Arizona consumer markets? If so, how should those consequences be mitigated? Staff concludes it comments with everyone's goal … Let's find a way to keep the lights on!

Reserve Requirements

AZ-NM-S. NEV POWER AREA
PROJECTED RESERVE REQUIREMENTS (MW)[1]
2000-2009

Year	Total Resources	Min. Requirements	Reserve Load Responsibility
2000	20,932	20,834	18,244
2001	22,187	22,060	19,486
2002	26,581	24,757	21,930
2003	31,521	25,454	22,541
2004	31,576	26,379	23,367
2005	32,076	27,348	24,225
2006	32,076	28,256	25,030
2007	32,576	29,140	25,813
2008	32,576	30,048	26,617
2009	32,576	30,966	27,430

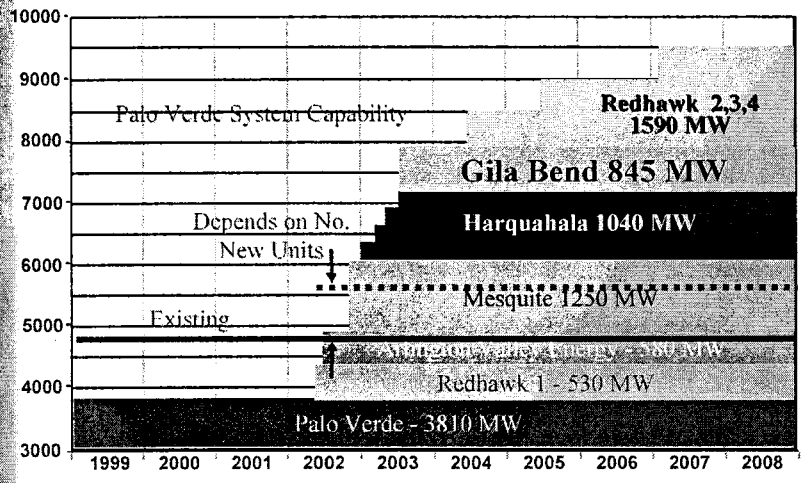
1,242

9,186

[1]Per WSCC: Planning and Operation for Electric System reliability, June 2000

11/9/00 ACC Gila Bend Power Plant FIGURE 1

Consolidated Plant Schedules



11/9/00 ACC Gila Bend Power Plant FIGURE 2

Summary of Existing Arizona Power Plants
Table 1

Plant	Switchyard Voltage (kV)	No. Units	Capacity (MW)*	AZ Utility Capacity (MW)*	AZ Utility Capacity (%)	No. Lines / Xfrm Ties
Agua Fria	230	3	142	142	100.00%	7
	69	3	407	407	100.00%	6
Apache	230	2	350	350	100.00%	4
	115	2	140	140	100.00%	5
	69	2	30	30	100.00%	4
Cholla	500	3	995	615	61.81%	4
	230	1	116	116	100.00%	4
Coronado	500	2	730	730	100.00%	4
Four Corners	500	1	740	587	79.32%	2
	345	1	740	587	79.32%	8
	230	3	560	560	100.00%	7
Horse Mesa	115	4	128	128	100.00%	3
Irvington	138	4	310	310	100.00%	10
	46	2	162	162	100.00%	15
Kyrene	230	2	101	101	100.00%	11
	69	3	163	163	100.00%	9
Mormon Flat	115	2	58	58	100.00%	2
Navajo	500	3	2,255	1,522	67.49%	3
North Loop	46	3	73	73	100.00%	6
Ocotillo	230	1	54	54	100.00%	7
	69	3	275	275	100.00%	6
Palo Verde	500	3	3,810	2,377	62.39%	5
Roosevelt**	115	1	36	36	100.00%	1
Saguaro	115	4	313	313	100.00%	12
San Juan	345	4	1,614	314	19.45%	7
Santan	230	2	157	157	100.00%	5
	69	2	156	156	100.00%	9
Springerville	345	2	800	800	100.00%	6
Stewart Mountain***	115	1	13	13	100.00%	1
Yucca	69	5	173	98	56.65%	4
W. Phoenix	230	3	240	240	100.00%	3
	69	3	94	94	100.00%	6
21 Plant Total		**80**	**15,935**	**11,708**	**73.47%**	

* Per WSCC Existing Generation Data Base

** Gen tie connected to Fraiser Sub which has two 115 kV lines

*** Gen tie connected to Goldfield Sub having 2-115 kV lines & 2 115/230 kV transformers

Summary of Proposed Arizona Power Plants
Table 2

Plant	Switchyard Voltage (kV)	No. Units	Capacity (MW)*	Plant/Line CEC Status	ACC Decision No.(s)	No. Lines / Xfrm Ties
Arlington Valley	500	1 CC	580	Approved	62740	5
Big Sandy	500	2 CC	720	Pending		2
Desert Basin	230	1 CC	520	Approved	61852/62426	2
Gila River	500	4 CC	2,080	Appr/Pend	62730/?????	3
Griffith	230	1 CC	520	Approved	61295	3
Harquahala	500	4 CC	1,040	Approved	62655	1
Kyrene	230	1 CC	250	Pending		2
Mesquite	230	4 CC	1,250	Pending		1
Redhawk	500	4 CC	2,120	Appr/Annc	62324/?????	2 or more
Santan	230	2 CC	825	Pending		5
W. Phoenix	230	2 CC	650	Approved	62321	5
Gila Bend	500	1 CC	845	Announced		1
South Point	230	1 CC	540	NA	NA	2
Sun Dance	115	8 CT	580	Announced		2
14 Plant Total		**36**	**12,520**			

* Per CEC Application or ACC Decision

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF SALT RIVER PROJECT AGRICULTURAL IMPROVEMENT AND POWER DISTRICT IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES SECTIONS 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING THE EXPANSION OF ITS SANTAN GENERATING STATION, LOCATED AT THE INTERSECTION OF WARNER ROAD AND VAL VISTA DRIVE, GILBERT, ARIZONA, BY ADDING 825 MEGAWATTS OF NEW CAPACITY IN THE FORM OF THREE COMBINED CYCLE NATURAL GAS UNITS, AND ASSOCIATED INTRAPLANT TRANSMISSION LINES.	CASE No. 105 DOCKET No. L-00000B-00-0105

At: Mesa, Arizona

Date: October 25, 2000

Filed: OCT 30 2000

REPORTER'S TRANSCRIPT OF PROCEEDINGS

VOLUME II
(Pages 266 through 519)

ARIZONA REPORTING SERVICE, INC.
Court Reporting
Suite Three
2627 North Third Street
Phoenix, Arizona 85004-1103

By: CAROLYN T. SULLIVAN, RPR
CCR No. 50528

Prepared for:

SITING COMMITTEE

CERTIFIED COPY
(When in red)

I N D E X

INDEX TO EXHIBITS

NO.	DESCRIPTION	IDENTIFIED	ADMITTED
A-70	Jennifer B. Tripp, P.E., resume of experience	400	418
A-71	East Valley Needs Assessment prepared by R. W. Beck	401	418
A-72	Slide presentation of Jennifer Tripp, P.E. (Pages 72-1 through 72-13)	--	418

to the sound?

CHMN. BULLIS: Let's go off the record for a moment.

(An off-the-record discussion ensued.)

CHMN. BULLIS: While we were off the record, we discussed very briefly Mr. Sundlof's proposed order of witnesses, beginning with Ms. Tripp, Mr. Bonsall, Ms. Libicki, and Mr. Dietrich, at which point Mr. Areghini will be called for the completion of his cross-examination, and then Mr. Palmer and Mr. Bergdale.

And if you want to go ahead and proceed with Ms. Tripp and have her sworn.

MR. SUNDLOF: We call Jennifer Tripp.

JENNIFER TRIPP,

called as a witness on behalf of Applicant, having been first duly sworn by the Certified Court Reporter, was examined and testified as follows:

DIRECT EXAMINATION

Q. (BY MR. SUNDLOF) Would you please state your name, professional affiliation, and address.

A. My name is Jennifer Tripp. I'm a principal

of R. W. Beck, Inc. My business address is 2201 East Camelback Road, Suite 115B, Phoenix, Arizona 85016.

Q. Would you please describe R. W. Beck.

A. R. W. Beck is a management consulting and engineering firm. It was founded in 1942 for the purpose of primarily serving the utility industry in the areas of planning, financing, design of generating plants and transmission, ratemaking, and other related issues.

Q. Can you describe your educational and professional background.

A. I have a Bachelor of Science in electrical engineering from the University of Cincinnati. I am a registered professional engineer in the states of Arizona and Ohio. I have 15 years' experience in the utility industry, including ten years as a consultant for R. W. Beck. I also worked for one utility in Ohio, Ohio Edison Company, which has now been renamed First Energy and since being renamed again.

Q. In the exhibit book marked as Exhibit 70 is a short form resume of your experience; is that correct?

A. Yes.

Q. Can you describe what you do at R. W. Beck.

A. I'm actively involved in the area of transmission issues regarding generating plant siting,

generation integration, congestion management, market pricing, generation project financing, and regulatory issues. I also, in doing that, I assist utilities and developers in selecting alternatives that best meet the transmission needs of the projects. In that regard, I've been involved in at least 100 generation integration plant studies in the last year.

Q. And what is the purpose of your testimony today?

A. The purpose of my testimony today is twofold:

The first is dealing with reliability issues in general.

The second is discussing load serving limitations of the East Valley specifically. In that regard, the East Valley limitations are based on a study that R. W. Beck performed, an independent study. That is, I believe, Exhibit 71 in the latest book.

The study was independent based on a couple different factors. The first were that R. W. Beck independently defined the scope and the approach to be used. We also did the study at our own direction using data that we gathered from SRP.

The results of the study that I'll talk about in my testimony also show two things:

The first is that the current East Valley

environmental issues for the neighborhood?

A. I did not.

Q. Thank you.

Would the Kyrene facility have been a viable option for this expansion?

A. I did not examine that, either.

Q. Okay, thank you.

And last, is there another area in the East Valley uninhabited, such as -- and let me just say that I live across the street from the proposed expansion. Would there be another area that is uninhabited in the East Valley that you feel -- or thought could serve this purpose?

A. We did not examine other sites as part of our study. However, looking at the transmission system, a standard combined cycle plant would require a minimum of three 230kV lines or two 500kV lines. And if you want, we could go back to the figure showing the East Valley, and there's just not many sites there. I mean, you can look and see the map, and there's very few where you would not have to build new transmission.

Q. And if they had to build new transmission, did you say how long you thought it would take?

A. Obviously, transmission -- building

JENNIFER B. TRIPP, P.E.

University of Cincinnati: **B.S. in Electrical Engineering**

Ms. Tripp is a Principal of R. W. Beck and has fifteen years experience in the Electric Utility Industry, including ten years as a consultant for R. W. Beck. She is actively involved in transmission issues relating to generation integration, congestion management, market pricing, generating project finance, regulatory issues and expert witness testimony. Her technical foundation includes transmission congestion, transaction, loss and constraint evaluations, open-access transmission analyses, generation resource planning and siting, transmission planning and needs assessment, all generally supported by power flow, stability and short-circuit studies. Through active involvement in the industry and targeted technical evaluations, she assists electric utilities and developers in evaluating the strength of various power generation/transmission alternatives under consideration by better understanding the economic effects transmission issues will have on the facility's competitive success.

She manages transmission system evaluations nationwide and internationally. These studies have included the modeling of many different system configurations, to determine the effects caused by changes in load levels, load patterns, generation output levels, new generation, transmission facilities and disturbances on the transmission system.

Ms. Tripp has also played a key role in presentations on various transmission issues such as transmission constraints, losses, loop flow, wheeling arrangements, contractual and scheduling discussions, and technical evaluation methods for various power transactions. Her utility background includes generation and transmission system operations experience and substation design. The operations experience specifically involved real-time security analysis program studies, short term production costing and economic dispatch analyses, power quality evaluations and transmission wheeling scheduling and contract administration.

Record of Testimony & Affidavits Submitted By JENNIFER B. TRIPP

Line No.	Utility	Proceeding (Docket Nos.)	Subject of Testimony	Before	Client	Year
1	Public Service Company of New Mexico	ER95-1800 ER96-1462 ER96-1551 EL95-75	Open Access and Power and Energy Sales Tariffs	Federal Energy Regulatory Commission	Navajo Tribal Utility Authority	1996(1)
2	Niagara Mohawk Power Corporation	OA96-194-000	Open Access Transmission Tariff	Federal Energy Regulatory Commission	Sithe/Independence Power Partners, L.P.	1996-1998
3	New York Power Exchange/ Independent System Operator	ER97-1523-000 ER97-986-000 OA97-470-000 ER97-4234-000	Affidavit Transmission Rates and Losses	Federal Energy Regulatory Commission	Sithe/Independence Power Partners, L.P.	1997-ongoing
4	Pacific Gas & Electric Company	ER98-2351-000 ER972358-000	Credit for Transmission Facilities	Federal Energy Regulatory Commission	Public Systems	1999(1)
5	Niagara Mohawk Power Corporation	EL99-65-000	Affidavit Transmission Rates and Losses Under Section 206 of the Federal Power Act	Federal Energy Regulatory Commission	Sithe/Independence Power Partners, L.P.	1999-ongoing
6	Niagara Mohawk Power Corporation - Remand	EL95-38-000	Affidavit Transmission Rates and Losses	Federal Energy Regulatory Commission	Sithe/Independence Power Partners, L.P.	1999-ongoing
7	New York Power Exchange/ Independent System Operator	ER97-1523-000 ER97-986-000 OA97-470-000 ER97-4234-000	Transmission Rates and Losses	Federal Energy Regulatory Commission	Sithe/Independence Power Partners, L.P.	1997-ongoing (2)
8	-	L-000000-00-0099	Certificate of Environmental Compatibility	Arizona Siting Committee	Panda Gila River, L.P.	03/2000

(1) Case was settled before testifying.
(2) Case in settlement discussions

compromised. Therefore, Staff support of power plant Certificate of Environmental Compatibility applications will be conditioned as set forth below.

ACC Staff support of power plant Certificate of Environmental Compatibility applications will be contingent upon the applicant providing, either in the application or at the hearing, evidence of items 1-3 below:

1. Two or more transmission lines must emanate from each power plant switchyard and interconnect with the existing transmission system. This plant interconnection must satisfy the single contingency outage criteria (N-1) without reliance on remedial action such as generator unit tripping or load shedding.
2. A power plant applicant must provide technical study evidence that sufficient transmission capacity exists to accommodate the plant and that it will not compromise the reliable operation of the interconnected transmission system.
3. All plants located inside a transmission import limited zone "must offer" all Electric Service Providers and Affected Utilities serving load in the constrained load zone, or their designated Scheduling Coordinators, sufficient energy to meet load requirements in excess of the transmission import limit.

ACC Staff support of power plant Certificate of Environmental Compatibility applications will further be contingent upon the Certificate of Environmental Compatibility being conditioned as provided in items 4-6 below:

4. The Certificate of Environmental Compatibility is conditioned upon the plant applicant submitting to the ACC an interconnection agreement with the transmission provider with whom they are interconnecting.
5. The Certificate of Environmental Compatibility is conditioned upon the plant applicant becoming a member of WSCC, or its successor, and filing a copy of its WSCC Reliability Criteria Agreement or Reliability Management System (RMS) Generator Agreement with the ACC.
6. The Certificate of Environmental Compatibility is conditioned upon the plant applicant becoming a member of the Southwest Reserve Sharing Group, or its successor, thereby making its units available for reserve sharing purposes.

Approved by:

Deborah R. Scott
Director
Utilities Division

This date: 2/8/00

DRS/jds:ESAR.doc