

ORIGINAL



0000060528

**GALLAGHER & KENNEDY**

P.A.

ATTORNEYS AT LAW

RECEIVED

2001 AUG 27 P 3:48

AZ CORP COMMISSION  
DOCUMENT CONTROL

2575 EAST CAMELBACK ROAD  
PHOENIX, ARIZONA 85016-9225  
PHONE: (602) 530-8000  
FAX: (602) 530-8500  
WWW.GKNET.COM

TODD C. WILEY  
DIRECT DIAL: (602) 530-8514  
E-MAIL: TCW@GKNET.COM

August 27, 2001

**VIA HAND-DELIVERY**

Docket Control  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

**Re:** *Allegheny Energy Supply Company, L.L.C.*  
*Docket No. L-00000AA-01-0116*

Dear Sir/Madam:

With this letter, Allegheny Energy Supply Company, L.L.C. files the original and 25 copies of the prepared testimony of Kevin Geraghty, Randall Simpson and Don Mundy.

Very truly yours,

**GALLAGHER & KENNEDY, P.A.**

By

Todd C. Wiley

Original and 25 copies filed this  
date with Docket Control

Arizona Corporation Commission  
**DOCKETED**

AUG 27 2001

DOCKETED BY	<i>nae</i>
-------------	------------

Docket Control  
August 27, 2001  
Page 2

COPY of the foregoing hand-delivered  
this 27<sup>th</sup> day of August, 2001 to:

Christopher Kempley, Esq.  
Legal Division  
Arizona Corporation Commission  
1200 West Washington  
Phoenix, Arizona 85007

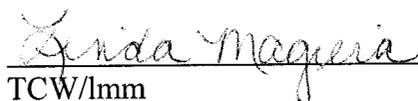
Utilities Division  
Arizona Corporation Commission  
1200 West Washington  
Phoenix, Arizona 85007

COPY of the foregoing mailed  
this 27<sup>th</sup> day of August, 2001 to:

Laurie Woodall  
Line Siting Committee Chair  
Office of the Attorney General  
1275 West Washington  
Phoenix, Arizona 85007

James D. Vieregg, Esq.  
Morrison & Hecker, L.L.P.  
Suite 1600  
2800 North Central Avenue  
Phoenix, Arizona 85004-1047  
Attorneys for AZURE

Kevin Geraghty  
Allegheny Energy Supply Co.  
Suite 201  
14122 West McDowell Road  
Goodyear, Arizona 85338

  
\_\_\_\_\_

TCW/lmm  
10407-0008/951084

LA PAZ GENERATING FACILITY  
SITING COMMITTEE CASE NO. 116

Prepared Testimony

of

Kevin C. Geraghty

August 2001

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Please state your name and business address.

A. My name is Kevin C. Geraghty. My business address is 14122 West McDowell Road, Suite 201, Goodyear, AZ 85338.

Q. By whom are you employed and in what capacity?

A. I am employed by Allegheny Energy Supply Co., LLC (“Allegheny,” “Allegheny Energy Supply” or “the Company”) as the Regional Director, Western Region. In this capacity, I am responsible for Allegheny’s generation projects in the Western United States. In relation to this Application, I am responsible for the permitting, design, construction, start up and operation of Allegheny’s proposed 1080 megawatt project in La Paz County Arizona.

Q. Please briefly describe your background, educational and work experience.

A. I graduated from the University of Pittsburgh with a Bachelor of Science Degree in Electrical Engineering in 1987 and I have been employed by Allegheny since that time. Over my 14 years with Allegheny I have worked exclusively on the generation side of the business. I have held various positions within plant operations and construction in various engineering and management positions at several power stations. For example, I

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

have been the Maintenance Manager in a 1700 megawatt coal fired facility and the Operations Manager in a 2000 megawatt coal fired facility. My last position before accepting my current responsibility was as Regional Director of the R. Paul Smith Region. This region encompassed 2 coal fired plants, 7 hydro plants and 1 combustion turbine plant located in 4 different states.

I have experience in managing multiple plant installations, large retrofits, new project development and improving plant operations. I am very familiar with environmental regulations and also the process of fostering good relationships with our host communities.

Q. What is the purpose of your testimony?

A. I will briefly describe Allegheny and its operations. I will also discuss why Allegheny should be granted a Certificate of Environmental Compatibility ("CEC") for its proposed facility in La Paz County ("the Project").

Q. What other witnesses will Allegheny present in this proceeding?

A. Randall Simpson of the URS Corporation and Don Mundy of Black and Veatch will also testify on the Company's behalf. They are both consultants to the Project. Mr. Simpson will offer an overview of the environmental review undertaken with respect to the Project and its associated transmission and interconnection facilities. Mr. Mundy will provide an

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

assessment of the needs and benefits associated with the construction and operation of the Project.

Q. Please describe the operations of Allegheny, both nationally and in Arizona.

A. The Company's parent, Allegheny Energy, Inc. is a multifaceted energy corporation consisting primarily of three companies – Allegheny Power, Allegheny Ventures and Allegheny Energy Supply, the Applicant in this proceeding. Allegheny Energy has been offering energy services and solutions for over 90 years. It is traded on the NYSE—the ticker symbol is AYE. Allegheny Energy is on the Fortune 500 list, the Standard and Poor's 500 Index, and the Forbes "Platinum 400" list. It has annual revenues of over \$4 billion and has assets of almost \$8 billion.

Allegheny Energy Supply is an energy supply company which provides electricity and natural gas at wholesale to national markets. The Company develops, designs, builds and operates generating facilities as well as trading and marketing wholesale gas and electricity. Allegheny has been operating generating facilities for over 80 years and operates a diverse profile of peaking, base and mixed operation units. Allegheny's portfolio of over 12,000 MW, with an additional 2,000 MW in development, includes hydro, pumped storage, biomass, tire-derived fuel, methane gas, natural gas, coal and oil facilities. We are consistently recognized for efficient operations, maintaining a top 10 presence in that area for over 10 years in the United States. The Company maintains a

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

strong commitment to operating our facilities in the most environmentally responsible way that provides our customers with access to low cost generation.

In Arizona, even though the Company does not yet have a physical presence, it has sold power to Arizona utilities. Through Allegheny Energy Global Markets, over the past two and one-half years, Allegheny has sold more than one million megawatt hours to Arizona Public Service Company and the Salt River Project from positions on the Palo Verde hub and some generation in California. Obviously, once the Project is operational in late 2004 or early 2005, we would expect sales to these and other Arizona utilities to increase.

Q. What is Allegheny's Environmental policy?

A. Allegheny's facilities meet or exceed all local, state or national requirements for operations. Since 1975, Allegheny has spent more than \$2 billion improving emissions and impacts from its facilities. Allegheny has reduced Sulfur Dioxide emissions from its coal fired facilities by more than 50%. NOX has been reduced by more than 35%. Allegheny's emission compliance strategy includes scrubbers, Low Nox Burners, Precipitators with advanced technologies and washed coal. Allegheny is currently investing almost 1 billion dollars at it's 2000 MW Harrison Power Station, 1400 MW Pleasants Power Station and 1700 MW Hatfield's Ferry Power Station to comply with new NOX regulations.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Allegheny has continued this tradition of environmental stewardship in relation to this Project. Even though the La Paz facility lies well outside non-attainment zones, it nonetheless will be equipped with Best Available Control Technology equipment to ensure emissions below Arizona Department of Environmental Quality and EPA standards.

Q. What is Allegheny's Community Relations policy?

A. Allegheny maintains a policy of engagement and support for our host communities. Allegheny forms working groups at each facility, provides access to resources within our projects and strives to support charitable activities with employee involvement and financial contributions.

Allegheny forms Community Advisory Panels at all generation facilities, even those in development, and uses third party professionals to facilitate the panels. The main objectives of the panels are to establish strong communication lines, educate and keep the community informed about operations and receive community input.

This Project's Advisory Panel was formed in May of this year, and has met twice. It consists of more than 20 members ranging from nearby residents to public officials. Materials concerning the La Paz Community Advisory Panel are included in Exhibit J-3 to the CEC Application.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Why has Allegheny decided to site a project in Arizona?

A. Arizona itself is a very rapidly growing market and is also centrally located to serve other growing WSCC areas. Allegheny already trades out of the Palo Verde hub, as I mentioned earlier, and a physical presence will enable Allegheny to offer longer term structured deals to local and regional buyers.

Q. Has Allegheny determined that a need exists for the Project?

A. Don Mundy of Black & Veatch will explore this question further, but the short answer is yes. The Project will help meet current and future energy needs in Arizona and the southwest, assist in assuring an adequate, economical and reliable electricity supply and provides several other system benefits as Mr. Mundy will discuss.

Q. What is the capacity of the Project?

A. The Project would be nominally rated at 1,080 MW, but this rating is at one set of ambient conditions. Additionally, the Project would employ a supplemental duct-firing system that would enable the project to maintain the 1,080 MW rating under the most extreme high temperature conditions. This same SDF system would allow the project to generate more than 1,080 MW during colder ambient conditions when demand and line capacity are available.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. When will the Project be commercially available?

A. The first 540 MW "block" would be ready for service in October 2004. The second 540 MW "block" would be available in April 2005.

Q. When would construction need to start?

A. In order to meet this projected "in service" date, construction would need to commence by September 2002.

Q. Where would the Project electrically connect?

A. The Project will interconnect to Southern California Edison's (SCE) Palo Verde – Devers 500 KV transmission line which lies approximately one and three quarter miles north of the Project.

Q. What is the fuel source for the Project?

A. Natural gas is the source of fuel for the Project. Diesel fuel, however, would be used to power emergency equipment such as fire pumps and generators during blackout conditions.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Where will Allegheny get the natural gas?

A. Allegheny will tie into an El Paso Natural Gas interstate pipeline which runs about four miles south of the Project.

Q. What will the Project's source of water be?

A. The Project will use groundwater obtained from the Harquahala Valley Irrigation Non-Expansion Area. Allegheny has acquired 2,325 acres of irrigable land with water rights that allow withdrawals for commercial and industrial uses such as the Project. The groundwater rights available generally for use amount to 6,975 acre-feet per year.

Q. How much water will be used?

A. The Project will use 6,500 acre-feet per year as designed. This usage represents at least a 40% reduction in water use as compared to the water rights associated with the lands' historic irrigated agricultural use.

Q. Did Allegheny consider any other sources of water?

A. Yes. Allegheny reviewed the possible use of CAP water but rejected that possibility based on its uncertain long term availability, quality and cost.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

CAP water availability is not capable of being firmly predicted. Instead, its availability is determined on a yearly basis based on several factors including annual river flows and other states' water rights. The Project is a baseload facility. Therefore, water availability must be known and certain to ensure plant operations and to enable the structuring of long term deals.

CAP water also is higher quality water than groundwater. Therefore, it makes sense to reserve CAP water for domestic uses or other higher quality requirements than plant cooling.

Finally, while the cost of CAP water itself does not preclude its use, the need for an assured supply and therefore a backup source does. Therefore, the Project would need to acquire the 2,300 acres of irrigable property regardless of CAP water use.

Q. How will Allegheny manage the property associated with the retired groundwater rights?

A. The properties Allegheny purchased were acquired so as to afford the best land management plan possible. The properties purchased are either currently irrigated by CAP water through the Harquahala Valley Irrigation District or are grazing properties. Allegheny plans to maintain the leases for the farm properties so that the agriculture economy of the Harquahala Valley is not adversely impacted and plans to maintain the grazing access associated with the other properties.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. What methods are being used by Allegheny to minimize the use of water?

A. The Project will be equipped with advanced water softening equipment which will maximize the reuse of water before discharge to the evaporation pond. The cooling towers will employ high efficiency drift eliminators to reduce water losses to drift. Additionally, Allegheny is exploring the possibility of using a nearby recharge facility for cooling tower blowdown.

Q. Please describe the operation of the Project.

A. The plant will consist of two 540 MW power "blocks". Each block will consist of two gas turbines and one steam turbine. Basically the gas turbines use gas similarly to how jet engines operate. They are coupled to generators and produce power by turning the generators. The waste heat leaving the gas turbines is used to make steam in boilers. The steam is fed to a steam turbine, which also produces power by turning its own generator. Cooling towers are then used to condense the spent steam back into condensate for reuse by the steam turbine.

The plant will employ Selective Catalytic Reactors (SCR) to remove oxides of nitrogen (NOX) to 2.5 ppmvd. SCRs use aqueous ammonia and catalyst "cells" to convert NOX into Nitrogen and Water.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

The plant also will use an oxidizing catalyst, almost identical to an automobile's catalytic converter to reduce emissions of Carbon Monoxide (CO) to 5.0 ppmvd.

Q. Has Allegheny secured the equipment for this Project?

A. Yes. Allegheny has secured the Gas Turbines and Steam Turbines for the Project. They are scheduled to be delivered to the Project site starting in September 2003 with the first steam turbine and ending in July 2004 with the last gas turbine.

Q. How much of a financial commitment has Allegheny already made to this Project?

A. More than \$200 million have already been committed to the Project and its anticipated cost will be more than \$500 million.

Q. Will Arizona ratepayers be affected by the Project?

A. Only in a positive fashion. Arizona ratepayers have no obligation to pay for the Project. Unlike the regulated world, Allegheny assumes all economic risks and ratepayers will not see any increased charges as a result of the Project. On the other hand, Arizona's public utilities will have greater access to increased competitive generation which should help to keep stable or possibly reduce rates paid by Arizona ratepayers. An abundant supply of a commodity is a must to maintaining stable, low prices.

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Has Allegheny studied the impacts this Project will have on La Paz County?

A. Allegheny has studied the Project operation on the current and future land uses in the area. The site was chosen for the very minimal impacts the Project would have on existing land uses. The Project will also have an immediate and positive impact on the County. Jobs related to the construction and operation will bring much needed spending dollars to the County and State. The property taxes generated by the Project will allow the County to reduce the tax burden on local residents. Finally, the Project's improvement of infrastructure at this location will improve the area's opportunity to attract other commercial operations. The economic and fiscal impact of the Project is analyzed and discussed in the ASU College of Business Study which is Exhibit J-1 to the CEC Application.

Q. Are any local approvals required for this Project?

A. Yes. The Project will require rezoning to Heavy Industrial and will require a special use permit. We anticipate these approvals shortly.

Q. What has the public response been to the Project?

A. Extremely positive. Public contact information is supplied at Exhibit J-3 of the CEC Application. In addition to the Community Advisory Panel process I discussed earlier,

**PREPARED TESTIMONY OF KEVIN C. GERAGHTY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Allegheny has received uniform public support at Open Houses conducted throughout the area.

Q. Has Allegheny performed the necessary studies to allow this Committee to grant a CEC based on the factors identified in A.R.S. § 40-360.06?

A. Yes. Allegheny has performed all of the necessary environmental impact studies to support the grant of a CEC for the Project. Mr. Simpson discusses these studies in greater detail.

Q. Do you have a recommendation for the Committee?

A. Yes. On Allegheny's behalf, I request that the Committee issue a CEC for the Project.

Q. Does this conclude your testimony?

A. Yes, it does.

12921-0004/949553

LA PAZ GENERATING FACILITY  
SITING COMMITTEE CASE NO. 116

Prepared Testimony  
of  
Donald L. Mundy

August 2001

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Please state your name and business address.

A. My name is Donald L. Mundy. My business address is 11900 East Cornell, Suite 300, Aurora, Colorado 80014.

Q. By whom are you employed and in what capacity?

A. I am employed by Black & Veatch, an engineering and construction company, as Vice President and Western Regional Director of the Power Delivery Business. In this position I am responsible for management, administration, planning and control of projects associated with power delivery facilities including substations, transmission lines and distribution systems.

Q. Please briefly describe your background, educational and work experience.

A. I received a Bachelor of Science degree from Purdue University in Electrical Engineering in 1971. While attending Purdue University, I was employed as a student engineer by the local electric utility company. I continued employment with that utility after graduation as a Transmission and Distribution engineer and subsequently joined Black & Veatch in 1975. I have been involved in consulting, engineering and construction related activities associated with electric Power Generation, Substations, Transmission Lines and Distribution System projects for over 30 years. I am a Senior Member of the Institute of Electrical and Electronic Engineers, a member of the National Society of Professional

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Engineering and currently hold Professional Engineer Registrations in the States of Indiana, Florida, Louisiana, Missouri and Colorado.

Q. What is the purpose of your testimony?

A. I will address need and benefit issues regarding Allegheny Energy's proposed La Paz Generating Facility (the "Project").

Q. Briefly, what are the issues that produce a need for new generating facilities?

A. New generating facilities are typically needed for Growth, Retirements, Environmental Issues, Pricing Stability, Security and Ancillary Services. This Project assists Arizona and the region in meeting all of these needs.

Q. Explain how Growth in this region creates a need.

A. Local (Arizona) and Regional (New Mexico, Arizona, Southern Nevada and California) growth in population and economic production/consumption of products/services are primary drivers for increases in electric power demand and energy consumption growth. This growth must be served with a variety of new generating facility additions, incremental generating facility enhancements and a series of conservation measures.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. What are the growth projections for this region?

A. From a population perspective, according to the Bureau of the Census, from 1995 - 2025 the Western United States is projected to grow at a rate nearly twice the national average. The first eight of the fastest growing states are Western States. From 1995 - 2025, Arizona is ranked the fourth fastest growing state, led only by California, New Mexico and Hawaii. From 1995 - 2025, the Arizona population is expected to increase by more than 50%. Arizona will likely exceed that projection given that the second quarter 2001 population estimates indicate that Arizona has already reached the year 2005 original projected levels. Current population growth projections for 2001 indicate a growth of 2.7% from 2000 levels.

Q. What are the economic growth indications?

A. Based on forecasts from the University of Arizona, the economic outlook is very good. The local economy will generate 72,000 jobs this year, sales gains should grow by 2.5-3.5%, residential building will be in the 50-55,000 unit range and personal income will continue to rise annually in the 5-6% range.

Q. What are the growth projections for electric power in the region?

A. According to the Western Systems Coordinating Council (WSCC), electric growth forecasts indicate a combined growth in the New Mexico/Arizona/Southern Nevada area

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

of 3.6% per year for over the next 10 years. This growth is the highest of all WSCC regions and is about twice the national average.

Q. What do these levels of regional growth mean in terms of new generating facilities requirements?

A. Keeping in mind that Arizona's actual growth is already exceeding estimates, the projected growth will require regional generating facilities adequate to serve at least 700 MW of new electrical load annually. The Project meets a portion of this need by adding approximately 1000 MW in the local area that can be used to serve both local and regional electric energy needs.

Q. But, other power projects have been announced or are under development in this area, so why do we need this Project?

A. For a variety of reasons. In today's merchant development situation, no one has a duty to build a power plant to meet customer growth or even to maintain a certain amount of generation as older units are retired. While many projects have been announced, some of these projects may not actually be built. Some developers will or may back out under certain market or regulatory conditions and some projects may not be fully licensed. For example, the Commission recently discussed at an Open Meeting that construction plans on several western plants including one in Arizona had been stopped because of the developers' adverse reaction to the FERC's June rate cap order.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Can you elaborate on the concept that some projects may not be built?

A. Yes. Based on a general review of Arizona projects that have been publicly announced, are in some stage in the CEC process, have completed the CEC process, are under construction or have recently come on line, the total generation on the horizon would add to values around 17,000 MW or so. But, of that 17,000 MW, only the South Point Project, the Griffith Energy Project, the Desert Basin Project and the West Phoenix Project which amount to about 1850 MW are actually on line. That leaves about 15,000 MW still at risk of completion.

Q. How are the remaining 15,000 MW at risk?

A. Of that number, only about 8900 MW or 60% have completed the CEC process. Further, some of those that have completed the process are being built in phases which allows the developer to stop at various points in the event that market conditions soften or some business or regulatory reversal occurs.

Q. So of the 15,000 MW at risk what is probably going to be built?

A. It is very doubtful that all of the planned capacity will be built either as planned and scheduled or at all. Many projects in this new uncertain marketplace have been announced and then been cancelled. It is my experience that less than 50-60 %--in this case 7,500-9,000 MW--of the projects that we hear about are actually completed.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Are you aware of any published opinion regarding the likelihood of predicted new power projects in Arizona actually being constructed?

A. Yes. The WSCC 2000-2009 plan indicates it believes only about 10,205 MW of new Arizona generation will actually be built during that period. Roughly 1760 MW of that list has now been built. That leaves about 8500 MW of new generation yet to be built or only 56% of the 15,000 MW discussed earlier. That percentage is consistent with my experience and indicates a fair amount of skepticism on the part of WSCC about just how many announced or certificated plants will, in fact, be built.

Q. Do retirements of existing generating facilities also enter into the need assessment?

A. Yes, very much so. We tend to think of today's generation capacity as a solid base line that will always be available, but that is not the case. Generating facilities will be retired in the region over the next decade. The exact numbers are unknown and in part will be based on economics, mechanical life, fuel supply issues, changing land use patterns and availability and capacity of the remaining generating facilities in the region. These retirements--both those that may be forced and those that may be desirable--create a need as they decrease the aggregate amount of power production facilities available to meet current and future electric demands.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. In general, how old are the Arizona generation facilities?

A. The Arizona facilities date back to about 1909. By the year 2005, when the La Paz Project is scheduled for operation, of the generation that is now currently available in Arizona, about 40% of that generation will be over 30 years old, about 20 % will be more than 40 years old and about 10% will be over 50 years old. This means that more than 6000 MWs of Arizona's power plants will be 30 years or older when this Project is scheduled to be fully operational.

Q. How will the La Paz Project help with these aging facilities?

A. Obviously, these plants are typically less efficient, require much more maintenance and may be less reliable than the new plants. The Project meets this need by adding approximately 1000 MW of the most efficient production capability available in the local area that can be used to serve both local and regional electric energy needs.

Q. How can we be assured that adequate supply will always be available?

A. The simple answer is we can't. In the pre-deregulation days, utilities had a duty to serve and were responsible to try to plan and construct facilities to meet the predicted loads in the region with ample reserves. In today's market, no one has a duty to serve and market forces will determine the supply side of the equation. However, given (1) the uncertainties of plants actually being constructed, (2) the uncertainties that some

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

developers might not be as good as others in this business and thus may fail and (3) the desire to maximize profits, it would seem prudent to have a greater reserve margin in the region on a going forward basis than has been necessary in the past.

Q. With all of the plants being considered for construction, even if a few are retired, won't we still have an abundance of supply?

A. Not necessarily. In today's market, just because a power plant is in your area does not mean that you will be able to utilize output from that plant. As an example, some plant owners may find that in some cases the surrounding area markets are more attractive and may sell their power elsewhere, thus diminishing local supply. Also as older plants retire and new ones are added, the transmission grid will become used in different ways and at times the grid may not allow delivery to certain locations. There also is no assurance that once constructed, the plants necessarily will be run at times of local need.

Q. Do environmental issues also create a need for new capacity such as this Project?

A. Generating facilities constructed 20, 30, 40 or more years ago generally are using technology that uses more fuel and produces a greater environmental impact than current technology to produce the same energy. While some of these facilities have been upgraded, in many instances it is impractical from either a cost or technology perspective to do so and rarely, if ever, can such upgrades bring these older units to today's efficiency and pollution standards.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. How does the Project help this need?

A. The need to use less fuel (be more efficient) and to improve environmental quality (lower emissions) is a pressing issue. The Project meets this need by using the best fuel-efficient technology available coupled with the lowest possible emission levels attainable.

Q. Please explain how the issue of pricing stability enters the need analysis.

A. For over a century, the United States has enjoyed the benefits of a regulated electric industry. While that industry had some good and bad points, it did provide a fair measure of stability in the price of electricity. Although at times some would argue that the price was too high, it was reasonably slow to change and the future price was somewhat predictable on a regional basis. We are now entering a deregulated business climate and are still working through the issues on how to adjust to this new situation. However, one item appears certain. While deregulation will bring certain benefits--among those a more competitive pricing landscape--the stability and predictability of that pricing will be very dependent upon supply and demand, just like any other free market commodity. Assuming, in the deregulated world, that we still have a desire (a need) to have reasonably stable and predictable pricing, then we must have an ample supply and choice alternatives when it comes to buying electricity. Recent developments in California and elsewhere in the country have underscored the importance of this point.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. How does the Project help fulfill this need?

A. The Project meets this need by adding approximately 1000 MW in the local area thus increasing supply that can be used to serve both local and regional electric energy needs.

Q. Please explain in the form of an example the need issue concerning system security?

A. The typical electric customer has learned from childhood that when you turn on the switch that the lights go on. Regardless of whether that customer is downtown, in the suburbs or in the country, so long as the electric system is intact, that premise seems to work. Most customers have also learned that when storms or floods arrive suddenly that sometimes the lights go off in limited areas, but not always at their house. Many a child has called Grandma during or after a storm to find out that her lights were out, but that the child's lights were still on. The ability to always have enough power everywhere to isolate outages and to control them to limited areas is system security. As the demands for power grow and the areas that want power change from open range to new housing and commercial districts, local and regional utilities and the power producers must work together to maintain system security. The utilities regularly analyze various scenarios to determine just how serious a condition would result if a given transmission line or power production facility were suddenly to experience an outage. These scenarios look at the physical location of facilities, the sizes of each element, how much margin is available at any moment in the system or a given area and the consequences of any given outage.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Does the Project help with the system security need issue?

A. Yes, in two ways. The Project meets the need for sustained and improved system security by (1) adding 1000 MW to the local/regional system which increases reserve margins and (2) adding the Project at a location away from other power production facilities, thus avoiding a common outage condition. For example, several of the new plants being discussed in the area are planned to be interconnected at the new Hassayampa Switchyard. If a major problem were to occur at that switchyard, the region could experience a sudden and perhaps prolonged loss of generation resources. This Project interconnects away from that switchyard. By interconnecting to the grid at a different location as the Project does in La Paz County, the probability of a single contingency taking out more than one generating plant is diminished.

Q. Please explain the need for ancillary services.

A. The electric system needs more than just generators and wires to make it work. Among the many needs to keep the system working properly, are items like var support, voltage regulation and spinning reserves. These items are commonly referred to as ancillary services. Without getting into details, these components are made available by power production facilities based on the manner in which those facilities themselves are operated. As an example, during hot summer days, electric systems are often stressed and voltages begin to drop causing the common condition known as "brownout." This condition is most easily visible in lighting systems, but it can cause equipment

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

overheating and failures in some instances. To avoid this problem, various power production facilities are called upon to raise voltages to reach and maintain desired levels.

Q. Does this Project help provide these Ancillary Services?

A. Yes, the Project helps fulfill these needs with added generation facilities that are capable of providing both local and regional ancillary services.

Q. Does the addition of the Project in this region of western Arizona offer any additional technical benefits?

A. Yes. By adding a new generation source in the region, general reliability will be increased by providing more resources. But, more specifically as to this Project, locating the new plant some distance both physically and electrically from Palo Verde and its satellite switchyard area increases system reliability should some form of disturbance occur at that major power center. Also, this Project is the only new Arizona plant proposed to be interconnected to the Devers-Palo Verde transmission line, at a location removed from the new Hassayampa Switchyard. Thus, the Project will provide unique voltage support and reduce regional system losses on this line.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Does interconnecting with the Palo Verde-Devers transmission line at this Project's location in La Paz county produce any other local benefits?

A. Tapping a 500 kV transmission line is an expensive proposition. In many instances, local development of new service facilities or even strengthening of the local sub-transmission grid cannot be cost justified due to the high cost of tapping a 500 kV transmission line. In this situation with the tap switchyard being needed and cost justified by the La Paz Project, it will then be much easier at a lower cost to improve the local area's sub-transmission service and reliability.

Q. Where would the Project electrically connect?

A. The project would interconnect to the Palo Verde – Devers 500 KV transmission line approximately one and three quarter miles north of the Project and about 45 miles west of Palo Verde.

Q. Please briefly describe the interconnection facilities.

A. The interconnection facilities begin at the generating facility with a 500 kV Switchyard which “collects” all of the new generation. Then, a new single 500 kV transmission line takes the power north to a new tap switchyard located adjacent to the Palo Verde - Devers transmission line. The interconnection tap switchyard on the Palo Verde - Devers line would be configured in such a manner as to “cut” the Palo Verde - Devers line into two

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

lines. One line would run from the tap switchyard to Devers and one line from the tap switchyard to Palo Verde. This configuration allows the new plant to remain connected to the grid with the loss of either the line to Devers or the line to Palo Verde. In a similar manner, should the line to the new plant be lost, the lines to Devers and Palo Verde would remain in service and connected together to allow power to flow as if the new plant tap switchyard had never been constructed.

Q. Are these interconnection facilities typical of others in your experience?

A. Yes. Most new generating facilities have these three components.

Q. The Project will use a single transmission line to interconnect. Is that also common?

A. Yes. The use of one or more transmission lines is typically based on either capacity or reliability issues. A single 500 kV transmission line can easily accommodate this Project's full output capability. As for reliability, in this case a meteorological forced outage of this length of interconnection could be expected only once every 50 years. A line designed to this standard typically meets or exceeds the National Electric Safety Code standard.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. What is meant by the term forced outage?

A. That term refers to outages that are not planned and that occur suddenly while the line is being used. They could result from meteorological events, earthquakes, auto accidents, structural failures and similar incidents.

Q. How are outages from meteorological events predicted?

A. The US Weather Service maintains long term records of actual wind, temperature and storm conditions. These statistics are then used to predict the recurrence interval of a certain meteorological condition such as high winds. As an example, it is predicted that a high wind of 70 mph will occur in this area every 50 years. Once a design recurrence interval such as 50 years is selected as the design basis, then the particular condition-- such as a 70 mph wind--becomes one of the many withstand loads that are used in selecting the materials and designs for the transmission line.

Q. Based on this discussion, would a single transmission line designed to withstand a 70 mph wind be adequate for the Project?

A. Yes.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. What about the effects of lightning?

A. Lightning strikes can damage a transmission line and can cause an outage. However, modern designs using multiple shield wires above the 500kV conductors reduce the probability of a lightning caused outage to very low probability for lines as short as the one we are discussing. These shielding techniques would be employed on the Project.

Q. How do you handle the other events that you mentioned that can possibly cause a forced outage of a Transmission line?

A. Most events can be handled similar to the meteorological analysis, but in some cases it is more prudent to use avoidance techniques. As an example, if we are concerned about auto accidents, then the line is constructed away from roadways or with additional barriers near the ground line.

Q. Other than for maintenance reasons, why would someone build two transmission lines from a power plant to an interconnecting line less than two miles away?

A. The most likely conditions are that the two transmission lines might be needed for capacity. Or, it might be less expensive in some situations. Or, it could be that terminal configurations are designed to allow the power in each line to be flowing in opposite directions.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Are any of these an issue for this Project?

A. No. A single 500 kV circuit is adequate. It would add cost to build a second line and the configurations at each end would not permit concurrent opposite flows. Obviously, building a second and unnecessary transmission line would also produce unnecessary environmental impacts.

Q. Does the proximity of the La Paz Project to the existing transmission line corridor offer any special transmission line considerations?

A. Yes. The very short length of the transmission line from the new plant to the Palo Verde-Devers line makes it almost as if the plant were being built directly under the existing transmission line. From that perspective, the Project has the advantage of almost no transmission element to become integrated into the grid. That situation improves losses, enhances reliability, reduces overall cost and minimizes environmental impacts.

Q. Can the Devers Palo Verde line accommodate the output of the Project?

A. Yes.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Has Allegheny studied the impacts that the Project would have on the interconnected transmission system?

A. A System Impact Study is currently being performed by Southern California Edison, the owner of the Devers-Palo Verde line. Based on my knowledge of the line, the interconnection of the Project will not compromise the reliable operation of the interconnected transmission system.

Q. Could you please explain the basis for your opinion that Project Interconnection will not compromise the reliable operation of the system?

A. Yes. Utilities go to great lengths to insist on system reliability. In the case of new generating facility additions, they will conduct several pre-construction studies, such as power flow, Transient Stability, Post-Transient Stability and short-circuit Duty. Further, the utility will require that the new facility owner agree to certain operating terms that address issues like conducting routine tests, coordination of protective devices, maintaining good frequency and voltage regulation and similar items. Finally, all of these requirements are incorporated into contractual agreements to ensure that no misunderstandings occur. As a last resort, the utility reserves the right to immediately disconnect the generating facility, in the event that they believe it is or is about to do the system harm.

**PREPARED TESTIMONY OF DONALD L. MUNDY  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Does this conclude your testimony?

A. Yes.

12921-0004/950118

**LA PAZ GENERATING FACILITY  
SITING COMMITTEE CASE NO. 116**

**Prepared Testimony  
of  
Randall L. Simpson**

**August 2001**

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Please state your name and the status of your employment.

A. My name is Randall L. Simpson. I am a senior project manager and planner for URS Corporation, a consulting firm located in Phoenix, Arizona.

Q. Please describe your education and professional experience.

A. I received a Bachelor of Science degree in Environmental Design in 1992 and a Bachelor of Landscape Architecture degree in 1993, both from North Dakota State University. I have 10 years of experience in environmental planning and electrical facility siting studies, with an emphasis on land use planning and visual resource inventory, assessment and mitigation planning. I have participated in environmental studies for 10 generating facilities and 14 transmission lines throughout Arizona, as well as in several other states.

Q. Are you familiar with the Arizona Power Plant and Transmission Line Siting Committee ("the Committee")?

A. Yes, I have participated in three power plant and seven transmission line siting projects that have been presented to this Committee and have assisted in the preparation of studies, testimony and supporting materials for presentation in these cases.

Q. What services have you performed for Allegheny's La Paz Generating Facility ("the Project")?

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

A. I have served as URS project manager and was responsible for overseeing the environmental studies and preparation of the Application for a Certificate of Environmental Compatibility ("Application"). URS environmental scientists and planners conducted the land use, biological resources, cultural resources, visual resources, water supply and noise analyses. Additionally, I coordinated our reviews with Applied Environmental Consultants, which was responsible for preparation of the Air Quality studies and Hydrosystems, which assisted with the preparation of the water supply studies.

Q. Please describe the main topics and scope of your testimony.

A. First, I will present an overview of the project site conditions. Second, I will describe the land use, biological resources, cultural resources, visual resources, noise, water supply, and air quality studies conducted for the Project and the results of those studies. Finally, I will provide my conclusion on the environmental compatibility of the Project.

Q. Please describe the site and land uses in the vicinity of the Project.

A. The Project is located in an unincorporated area of La Paz County, about 21 miles southeast of Salome and Wenden. URS conducted an inventory of existing land uses within a 2-mile radius of the boundaries of the proposed generating facility and proposed transmission line. The Exhibit A-3 map in the Application shows the existing land uses in the vicinity of the Project and the inventory results are described in the land use study

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

report (Exhibit A). The study area including the generating facility site is either irrigated farmland that is currently in production, fallow agricultural land used for cattle grazing or non-developed desert scrub land.

There are several compatible industrial land uses in the area including the Palo Verde-Devers 500kV transmission line, the Central Arizona Project canal, the Vidler Water Company's water recharge facility, and an El Paso Natural Gas pipeline corridor and compressor station. Scattered 12kV distribution lines and several aboveground wells also are located within the area. There are one main and two secondary transportation corridors in the Project area. Interstate 10 is the primary corridor and is less than 3/4 of a mile north of the proposed generating facility. Avenue 75 East provides access to the proposed generating facility site from Exit 69 along Interstate 10. Salome Road is located 3 to 4 miles north-northeast of the proposed transmission line interconnection and switchyard site.

The nearest residence outside of the proposed generating facility boundary is approximately 1.75 miles north. A recreational vehicle park, as well as other scattered residences, are located approximately 2.5 to 4 miles away. The Project will not displace any existing or planned residences in the area.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Please describe the planned land uses in the Project's vicinity.

A. The La Paz County Zoning Regulations guide future land use in the unincorporated areas. As shown on the Exhibit A-4 map which was filed with the Application, the Project site is currently zoned "Rural Residential." However, the facility site is in the process of being rezoned for heavy industrial use by La Paz County. Allegheny also will develop a well field in Section 1, Township 2 North, Range 11 West. Allegheny owns the 160 acres of land within the southwest quarter of this section, which is already zoned for heavy industrial use, and has initiated a land exchange with the Bureau of Land Management (BLM) to acquire the remaining 480 acres of land within the section. The BLM has prepared a Feasibility Analysis and recommended proceeding with the exchange on August 10, 2001.

After submittal of the original Application, we learned of two additional zoning cases which had been approved by La Paz County about 15 years ago, but which were not identified on the County's zoning maps. As a result, we prepared and filed a supplement to the Application. It consists of a revised Exhibit A-4 map and minor changes to Exhibits A and E. That revised map and exhibits should be substituted for the original A-4 map and Exhibits A and E in the Application. The first planned development is a mixed use area located approximately 1.5 miles north of the generating facility site adjacent to the east side of Avenue 75 East. This conceptually planned mixed use area, designated in 1985, was proposed to be used as a general commercial, RV park, and manufactured home park/residential area although no actual development has occurred.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

The proposed transmission line would span a 400- to 500-foot section of the conceptually planned commercial property designated for restaurants and a truck stop. However, the proposed transmission line would not restrict future site access or displace any proposed structures. The conceptually planned mobile home park would be approximately 3/4 mile east of the proposed transmission line.

The second conceptually planned commercial development is located on the west side of Avenue 75 East. No specific plans were identified for this development and the proposed transmission line would not restrict future site access or displace any proposed structures.

Q. How will Allegheny's property that is not required for the generating facility and switchyard be used in the future?

A. The agricultural property in the Harquahala Valley acquired by Allegheny will continue to be farmed using Central Arizona Project ("CAP") water for irrigation purposes. The property adjacent to Centennial Wash will remain desert open space, except for the five well sites to be developed.

Q. Would the Project affect floodplains?

A. No. URS confirmed the location and limits of the Federal Emergency Management Agency designated 100-year floodplain for Centennial Wash as illustrated on Exhibit G-4. The generating facility and evaporation ponds are located outside the 100-year

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

floodplain and therefore would not result in impacts. Additionally, the evaporation ponds will include design measures such as berms and diversion dikes to ensure that they are not affected in the event of a flood.

Q. Will the generating facility be landscaped?

A. Yes. The perimeter of the generating facility will be landscaped using a mixture of native and non-native tree and shrub species to enhance the aesthetics of the facility. The conceptual landscape plans are shown in drawings attached to this testimony as Exhibits RLS-1.

Q. Based on the analyses conducted, what is your conclusion regarding the Project's impact on existing uses and future land use plans?

A. The Project would be compatible with existing and planned land uses and will not conflict with identified future development plans. Impacts to existing and future development plans would range from low to moderate, respectively.

Q. Was an evaluation of biological resources conducted? If so, please describe the process that was used.

A. Yes, an inventory and assessment of the Project was conducted by URS biologists. The process included reviewing existing material provided by federal and state agencies as

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

well as field visits in the Project vicinity. Existing materials that were reviewed included aerial photography, topographic maps and review of rare and endangered species lists from the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department. Specific surveys for the southwestern willow flycatcher, Sonoran desert tortoise, and cactus ferruginous pygmy-owl began in the Spring of 2001. These surveys are being conducted in accordance with agency-established guidelines and protocols and will continue until the Spring of 2002. These surveys also included documentation of common plant and wildlife species present in the area. Detailed information concerning these subjects is set forth in Exhibits C and D of the Application.

Q. What is your conclusion regarding the Project's potential impact on biological resources?

A. Results of the biological evaluation indicate that there are no special status or threatened and/or endangered plant or wildlife species on the Project site. While temporary disruption of wildlife in adjacent habitats may occur during construction, this potential is minimal and transient. The plant communities that will suffer loss due to construction are not critical to any species listed by government agencies as species of special concern. Areas of non-developed desert scrub landscapes disturbed during construction and not occupied by the proposed facilities will be revegetated. This may include salvaging existing larger size plant materials and transplanting them after construction of the Project. The proposed facilities would not result in adverse impacts on plant and wildlife species.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Please describe for the Committee the results of the evaluation of cultural resources.

A. The complete technical report is Exhibit B-2 to the Application and the results of the record search are summarized in Exhibit E. Additionally, a cultural resources field survey report completed after the Application was filed is attached to this testimony as Exhibit RLS-2.

Record searches revealed that six archaeological sites have been recorded within the 33 square-mile record search area, but none are located within the footprint of the Project facilities. All of the sites are relatively small and simple and reflect limited aboriginal exploitation of the Harquahala Plain.

The intensive field surveys covering approximately 987 acres identified two sites within the proposed project area consisting of a low-density scatter of prehistoric artifacts. Both of these sites have the potential to be evaluated by the State Historic Preservation Office for archaeological data. Additionally, the field survey identified several isolated occurrences of prehistoric artifacts; none of which were evaluated as having historic values that warrant preservation.

Q. What are your conclusions regarding cultural resources?

A. The two archaeological sites of relative importance could be avoided during the construction of the proposed facilities. In the unlikely event the sites cannot be avoided

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

during construction, impacts could be minimized by undertaking archaeological testing and data recovery efforts if warranted.

Q. Did you evaluate visual resources associated with the Project?

Yes. URS conducted a visual resource study that included an evaluation of visual conditions including scenic quality and project visibility. Impacts on scenic quality would range from low in the desert scrub landscapes to moderate in the agricultural landscapes. Impacts on views from the nearest residence, approximately 1.75 miles north of the generating facility would be moderate. This is primarily because the residence would be viewing across Interstate 10 and through the existing Palo Verde-Devers 500kV transmission line. Impacts resulting from the transmission line and switchyard would be similar.

Impacts on views from Interstate 10 would be moderate for both the generating facility and transmission line crossing. This is primarily due to the lack of scenic designations along Interstate 10, the relatively short viewing duration and the existing modifications present in the landscape. The closest access point to the Eagletail Mountains Wilderness is located about 4 to 5 miles to the south of the generating facility site. Views of the generating facility would result in low impacts primarily due to partial vegetation screening distance.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. Do you have examples of how the Project would appear?

A. Photo simulations were prepared to show anticipated views of the project and are included in the Application as Figures E-2, E-3A, E-3B, E-4A, E-4B and E-5. One mitigation measure noted within the photo simulations is the color of the facility itself. Taking into account the dark backdrop, the color green was applied to the facility to blend with the distant mountains and surrounding vegetation. Additional recommended mitigation measures being considered include landscaping around the generating facility site as I've discussed and directional and shielding devices for light fixtures.

Q. What are your conclusions regarding the visual analysis?

A. The Project would not result in adverse impacts on visual resources after the application of the recommended mitigation measures.

Q. Were potential impacts related to noise and interference with communication signals considered? If so, what conclusions were reached?

A. Noise emission levels and possible interference with communication signals were analyzed for the Project. We concluded that the Project would not result in adverse noise impacts on sensitive receptors within the area. Noise impacts primarily would occur during construction and during steam blows, when ambient noise levels for sensitive receptors may be exceeded; however, these impacts would be short term and efforts

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

would be taken to minimize the occurrences. Sound levels would not result in an adverse noise impact based upon Federal Transit Administration (FTA) and U.S. Department of Housing and Urban Development (HUD) standards.

Electrical effects of the proposed 500kV transmission line interconnection and switchyard including audible noise and radio and television interference would be minimized by location, design, and construction practices and would not be adverse. Effects due to electrical or magnetic induction are highly unlikely.

Q: Please describe the evaluation of air quality and resources that was conducted.

A: Three main analyses were conducted for air quality. First, a Best Available Control Technology (BACT) analysis was conducted to evaluate currently available control technologies for equipment similar to that proposed for the Project. Next, an emissions inventory was conducted to quantify the maximum predicted ambient impacts due to emissions from the facility for comparison with applicable National Ambient Air Quality Standards, Prevention of Significant Deterioration (PSD) increments and Arizona Ambient Air Quality Guidelines. Finally, visibility impact modeling was conducted to evaluate potential visibility impacts. The air quality studies are contained in Exhibit B-1 to the Application.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q: What were the results of the BACT analysis?

A: The BACT was evaluated for the combustion turbine generator/heat recovery steam generator units, cooling towers, auxiliary boiler and emergency generators.

The proposed BACT to control emissions from the combustion turbine generator/heat recovery steam generator units consists of dry low-nitrogen oxide burners with selective catalytic reduction, catalytic oxidation for carbon monoxide control, good combustion practices and the use of natural gas as a fuel source, which is inherently low in sulfur content.

The proposed BACT to control emissions from the cooling towers is high-efficiency drift eliminators; the proposed BACT to control emissions from the auxiliary boiler is dry-low nitrogen oxide burners, good combustion practices, and the use of natural gas as fuel; and the proposed BACT for the emergency generators is the use of low sulfur diesel fuel along with good combustion practices.

The proposed BACT will result in emission limits that are equal to or more stringent than other recently permitted facilities that are similar in design to the La Paz Generating Facility.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q: What were the results of the visibility impact modeling?

A: The final results of the visibility modeling showed that there were no exceedances of the screening criteria for visibility impacts for all of the nearby wilderness areas that were included in the study.

Q: What were the results of the air impact assessment?

A: The air impact analysis showed that the highest impacts among the criteria pollutants evaluated were well below the applicable standards, ranging from 4 percent to 42 percent of the National Ambient Air Quality Standards and from 3 percent to 38 percent of the applicable PSD increments. The Arizona Ambient Air Quality Guidelines analysis also showed impacts well below applicable thresholds, ranging from less than 1 percent to 16 percent.

Q: Has a Title V Air Quality Operating Permit been submitted to the Arizona Department of Environmental Quality (ADEQ)?

A: The La Paz Title V operating permit application is being prepared in conjunction with the facility PSD construction permit. This will be a combined submittal and should be completed and filed in September 2001.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q: What conclusions have you reached based upon the air studies completed for the La Paz Generating Facility?

A: Construction, operation, and maintenance of the La Paz Generating Facility will not result in adverse impacts on air quality. The generating facility will use BACT to control emissions at levels equal to or below other recently permitted generating facilities of similar design. These emission levels will result in ambient air quality impacts that are well under the applicable standards established by ADEQ and the U.S. Environmental Protection Agency (EPA).

Q: How much water will the Project require for operation and what is the source?

A: The La Paz Generating Facility will use approximately 6,500 acre-feet of water per year. Groundwater will be pumped from a well field to be located about ½ mile southeast of the facility. Allegheny has acquired 2,325 acres of land in the Harquahala Valley; groundwater rights associated with this property will be used to supply water to the generating facility.

Q: Has a water supply study been conducted for the Project?

A: Yes. A water supply study has been conducted and is Exhibit B-3 to the Application. The studies included evaluation of the existing groundwater and site conditions, as well as use

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

of a numerical groundwater model to evaluate three scenarios established to predict the impacts associated with pumping groundwater for the generating facility.

Q: What were the results of the three water usage scenarios studied?

A: Scenario 1 assumed a baseline case using 1997 rates of groundwater pumpage and recharge. The results for Scenario 1 concluded that over the next 30 years, groundwater levels would decline approximately 20 to 40 feet in the vicinity of the Project's well field but would increase 50 to 70 feet in the southeastern section of the Harquahala Basin.

Scenario 2 considered the baseline conditions described for Scenario 1 along with groundwater pumping from five production wells equivalent to 7,000 acre-feet per year for the project, which would be a "worst case" scenario. The "worst case" scenario, which is highly unlikely, can be characterized as continued pumping of groundwater at current rates, pumping the maximum 7,000 acre-feet per year and no recharge of CAP water. Scenario 2 resulted in an approximate additional 30 feet of decline of water levels after 30 years in the vicinity of the Project's well field and approximately 20 feet of water level decline 3 to 5 miles from the well field.

Scenario 3 considered the conditions modeled for Scenarios 1 and 2 along with groundwater recharge from the Vidler Water Recharge Facility beginning in 2002. Recharge was assumed to range from 5,000 acre-feet per year in 2002 and increase to 70,000 acre-feet per year by 2006 through 2031. Scenario 3 resulted in a net rise in

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

groundwater levels of approximately 150 to 175 feet in the vicinity of the well field. This effect is expected to extend across the entire Harquahala Basin.

Q: What conclusions can be made based upon the water supply studies completed for the La Paz Generating Facility?

A: The results of the water supply study indicate an adequate supply of groundwater of suitable quality to meet the needs of the La Paz Generating Facility for the projected 30-year life. Even under a "worst case" scenario water level declines would be minimal. It is also likely that the Harquahala Basin will see a net increase in groundwater levels when the Vidler Water Recharge Facility is in operation.

Q: What is the status of the other permits being obtained for the Project?

A: The zoning application for the generating facility site is being discussed with La Paz County and approval is expected in the fall of 2002. The air permit will be filed in September 2001 and approval is expected in August 2002. The aquifer protection permit (APP) will be filed in October 2001 and approval is expected by the Summer of 2001. The BLM land exchange has been initiated and a Record of Decision is expected in the summer of 2002. The right-of-way application for land owned by the Arizona State Land Department will be filed in the Fall of 2001 and approval is expected in the spring of 2002.

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

Q. In comparison, how do the environmental impacts for the Project relate to those associated with other recently permitted generating facilities of similar design?

A. In relative terms, environmental impacts associated with this Project are below impact levels of other recently permitted generating facilities. There were no high impacts identified and all of the impacts identified are in the moderate to low range. This site is an excellent location for a generation facility. The Project is compatible with existing and future land use plans and would result in low to moderate impacts, respectively. There were no special status or threatened and/or endangered species identified by agencies or in the field surveys; therefore, impacts on biological resources would be low. There were two archaeological sites consisting of a low density of prehistoric artifacts identified in the study area--both of which will likely be avoided during construction and would result in low to no impacts.

Impacts on scenic quality and views would range from moderate to low due to the lack of scenic diversity in the area and existing modifications visible in the landscape. Noise levels from construction may exceed ambient levels; however, those from operation of the generating facility would not. Noise levels would not exceed FTA or HUD standards and would not be adverse.

Emission levels from the generating facility will result in ambient air quality impacts that are well under the applicable standards established by the ADEQ and EPA. There is an

**PREPARED TESTIMONY OF RANDALL L. SIMPSON  
LA PAZ GENERATING FACILITY PROJECT/CASE NO. 116**

ample supply of groundwater and the pumpage resulting from the Project combined with recharge from the Vidler facility will result in a net increase in current groundwater levels

Q. In summary, what is your opinion as to the environmental impacts that may result from the construction and operation of the Project?

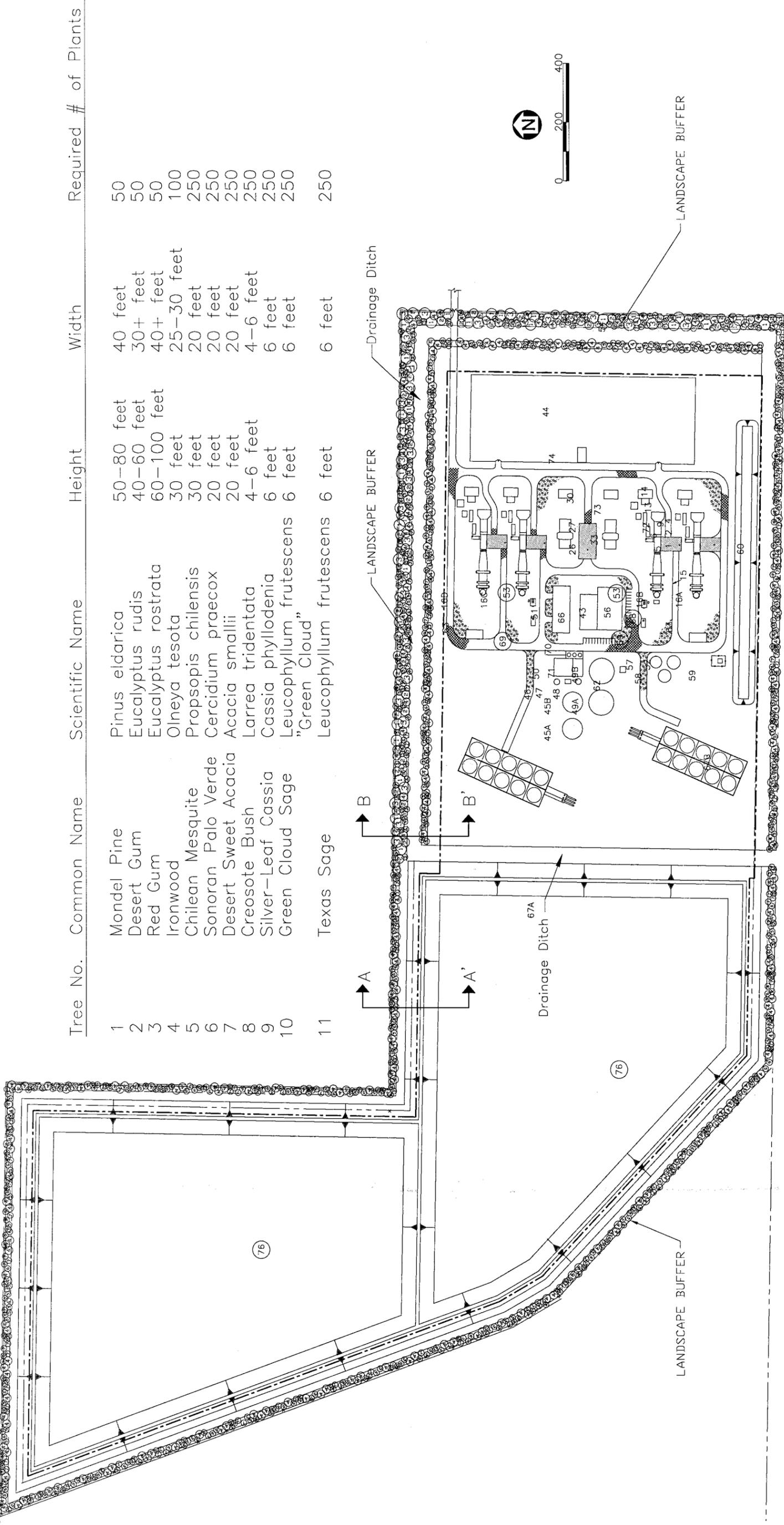
A. Based on the studies URS conducted and other information presented in the Application, the project will result in minimal or negligible environmental effects. Construction, operation, and maintenance of the Project in the manner proposed, together with implementation of applicable mitigation measures, will be effective in minimizing impacts. Further, based on my review of the factors set forth in the siting statute and comparable projects previously reviewed and approved by the Siting Committee and the Arizona Corporation Commission, it is my opinion that the Project would be compatible with the environment.

Q. Does this conclude your testimony?

A. Yes, it does.

12921-0003/944591

# **EXHIBIT RLS-1**



Tree No.	Common Name	Scientific Name	Height	Width	Required # of Plants
1	Mondel Pine	Pinus eldarica	50-80 feet	40 feet	50
2	Desert Gum	Eucalyptus rudis	40-60 feet	30+ feet	50
3	Red Gum	Eucalyptus rostrata	60-100 feet	40+ feet	50
4	Ironwood	Oleaya tesota	30 feet	25-30 feet	100
5	Chilean Mesquite	Prosopis chilensis	30 feet	20 feet	250
6	Sonoran Palo Verde	Cercidium praecox	20 feet	20 feet	250
7	Desert Sweet Acacia	Acacia smallii	20 feet	20 feet	250
8	Creosote Bush	Larrea tridentata	4-6 feet	4-6 feet	250
9	Silver-Leaf Cassia	Cassia phyllodenia	6 feet	6 feet	250
10	Green Cloud Sage	Leucophyllum frutescens "Green Cloud"	6 feet	6 feet	250
11	Texas Sage	Leucophyllum frutescens	6 feet	6 feet	250

NOTE: LANDSCAPE PLAN INCLUDES IRRIGATION SYSTEM TO ASSURE PROPER ESTABLISHMENT OF TREES AND SHRUBS



REFERENCES	REFERENCES	REVOLUTIONS	REVOLUTIONS	SCALE:	AS NOTED	DATE
TITLE	NO. BY DATE	DESCRIPTION	NO. BY DATE	DESCRIPTION	DATE	
	TR 6/01	CONCEPTUAL FOR APP PERMITTING		RLS	6-01	
				CSC	6-01	
				RLS	6-01	
				RLS	6-01	

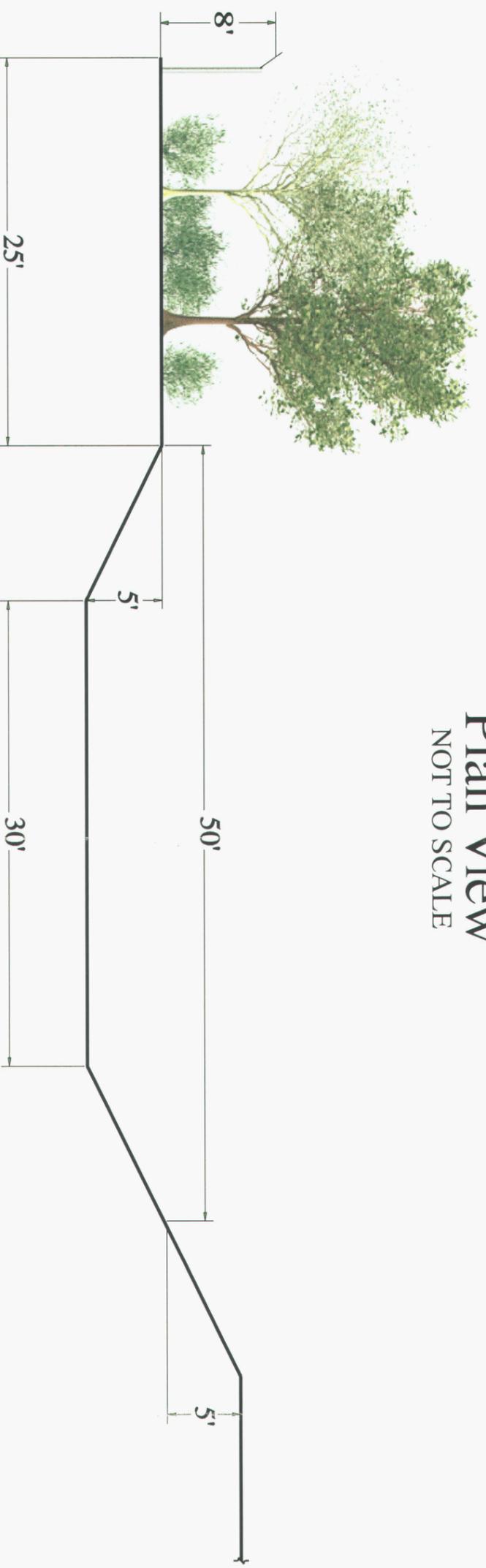
ALLEGHENY ENERGY SUPPLY COMPANY	
CONCEPTUAL LANDSCAPE PLAN	
LA PAZ GENERATING FACILITY	JOB NO. E1-0001722.03
EVAPORATION POND	DRAWING NO. REV.
LA PAZ COUNTY, ARIZONA	-
	A

### Exhibit RLS-1.1



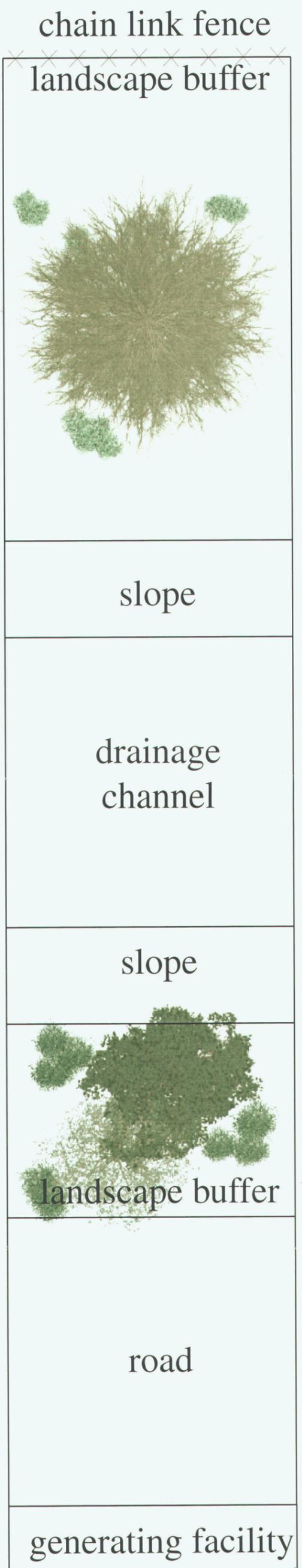


**Plan View**  
NOT TO SCALE



**Section A-A'**  
NOT TO SCALE

**Conceptual Landscape Plan**  
La Paz Generating Facility  
RLS - 1.2



**Plan View**  
NOT TO SCALE



**Section B-B'**  
NOT TO SCALE

**Conceptual Landscape Plan**  
La Paz Generating Facility  
RLS - 1.3

# **EXHIBIT RLS-2**

# Cultural Resource Survey for the Proposed La Paz Generating Facilities Project, La Paz County, Arizona

prepared for

**Allegheny Energy Supply Company**

for submittal to

**Arizona State Land Department**

prepared by

**URS**

URS Cultural Resources Report 2001-63(AZ)

Restricted Information

August 2001



**CULTURAL RESOURCE SURVEY FOR THE  
PROPOSED LA PAZ GENERATING FACILITIES PROJECT,  
LA PAZ COUNTY, ARIZONA**

prepared for

**Allegheny Energy Supply Company**  
McDowell Road Professional Plaza, Suite 201  
14122 West McDowell Road  
Goodyear, Arizona 85338

for submittal to

**Arizona State Land Department**  
1616 West Adams Street  
Phoenix, Arizona 85007

prepared by

Sharon K. Bauer  
Penelope Taylor Baar  
David E. Doyel  
**URS Corporation**  
7720 North 16<sup>th</sup> Street, Suite 100  
Phoenix, Arizona 85020

URS Cultural Resource Report 2001-63(AZ)

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

**August 2001**

## TABLE OF CONTENTS

---

List of Tables.....	ii
List of Photographs .....	ii
List of Figures .....	ii
Abstract .....	iii
Acknowledgments.....	vi
Chapter 1 - Introduction .....	1
Project Description.....	1
Project Location .....	1
Scope of Survey .....	4
Environmental Setting.....	6
Climate .....	6
Physiographic Setting.....	6
Natural Vegetation and Wildlife .....	7
Cultural History Background .....	8
Pre-Columbian Occupations .....	8
Ethnohistoric Occupation .....	9
Euroamericans .....	12
Chapter 2 - Records Review (Class I Survey).....	14
Prior Cultural Resource Studies .....	14
Previously Recorded Cultural Resources .....	17
Survey Expectations.....	18
Chapter 3 - Field Survey (Class III Survey).....	20
Field Survey Methods .....	20
Survey Results.....	21
Site AZ S:7:48 (ASM).....	21
Site AZ S:7:49 (ASM).....	24
Isolated Occurrences .....	28
Chapter 4 - Conclusion and Recommendations .....	30
Summary .....	30
Assessment of Potential Impacts.....	30
Recommendations .....	32
References Cited .....	33
Appendix A: Site Forms	
Appendix B: Isolated Occurrences Forms	

## LIST OF TABLES

---

1	Summary of Proposed Survey Acreage .....	4
2	Summary of Acreage Surveyed .....	4
3	Prior Projects in the Vicinity of the La Paz Generating Facilities Project.....	16
4	Previously Recorded Sites in the Vicinity of the La Paz Generating Facilities Project	18
5	Summary of Isolated Occurrences .....	29

## LIST OF PHOTOGRAPHS

---

1	Overview of the transmission line corridor, Alternative B .....	7
2	Rock Cluster, Feature 1, Site AZ S:7:49 (ASM) .....	26

## LIST OF FIGURES

---

1	General Project Area .....	2
2	Land Ownership .....	3
3	Survey Area.....	5
4	Prior Surveys and Previously Recorded Sites.....	15
5	Locations of Sites and Isolated Occurrences .....	22
6	Map of Site AZ S:7:48 (ASM).....	23
7	Map of Site AZ S:7:49 (ASM).....	25

## ABSTRACT

---

- Agencies:** Arizona State Land Department  
Arizona Power Plant and Transmission Line Siting Committee of  
the Arizona Corporation Commission
- Report Title  
and Date:** *Cultural Resource Survey for the Proposed La Paz Generating Facilities  
Project, La Paz County, Arizona*  
August 2001
- Project  
Number:** URS Project Number E1-00001722.04
- Project  
Description:** The Allegheny Power Supply Company (Allegheny) proposes to construct a power plant and associated facilities approximately 75 miles west of Phoenix. Allegheny retained URS to conduct environmental studies to support their application to the Arizona Power Plant and Transmission Line Siting Committee for a Certificate of Environmental Compatibility (CEC). Additionally, since a portion of their proposed transmission line and pipeline cross portions of Arizona state trust land, the cultural resource studies were intended to support the Arizona State Land Department and Siting Committee in complying with state laws related to protection of archaeological and historical resources.
- Allegheny is proposing to construct the La Paz Generating Facility, which includes (1) a 1,080 megawatt power plant, (2) a 500kV interconnect line and switchyard, (3) a well field, and (4) a natural gas pipeline lateral.
- Location and  
Ownership:** The project area is located at the boundary between La Paz and Maricopa counties, approximately 75 miles west of Phoenix. The site of the proposed plant and associated facilities is approximately 75 miles west of Phoenix in eastern La Paz County and western Maricopa County. The proposed power plant is located on privately owned land in Section 35, Township (T) 3 North (N), Range (R) 11 West (W), Gila and Salt River Base Line and Meridian. Alternative A of the proposed switchyard is located in Section 25, and Alternative B in Section 26 of T3N, R11W. Both are located on privately owned land. The transmission line alternatives extend south through privately owned and Arizona state trust land from the switchyard locations, in Sections 25, 26, 35, and 36 of T3N, R11W. The well field is located on privately owned land in Section 1, T2N, R11W. The first "leg" of the pipeline, on Arizona state trust land, is oriented east-west just north of the southern section boundary in Section 36, T3N, R11W. The remainder of the proposed pipeline route extends

south through privately owned and Arizona state trust land to the existing El Paso Natural Gas pipeline along the western edge of Sections 2, 7, 18, 19, and 30, T2N, R10W.

The project area, including a 1-mile buffer as part of the Class I research, is depicted on the Lone Mountain, Courthouse Well, Eagletail Mountains West, and Eagletail Mountains East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.

**Acreage:** In total, we surveyed about 987 acres. Approximately 777.5 acres are privately owned land and 209.5 acres are Arizona state trust land.

**Survey Permit Number:** Arizona Antiquities Act permit number 2001-28bl

**Personnel and Dates of Field Survey:** Sharon K. Bauer directed the field survey, and was assisted by archaeologists Penelope Taylor Baar, Kim Ryan, and Sebastian Chamorro. The fieldwork was conducted between 16 and 26 July 2001, requiring a total of 25 field-person days of effort. Dr. David E. Doyel served as principal investigator.

**Number of Sites:** Two archaeological sites and 30 isolated occurrences of archaeological materials were recorded within the surveyed area.

**Register Eligible Sites:** Sites AZ S:7:48 and 49 (ASM) are large, low-density scatters of prehistoric Hohokam chipped and ground stone, ceramics, and possible fire-cracked rock. Site AZ S:7:49 (ASM) also contains a small rock cluster. Both sites have the potential to yield information about regional subsistence strategies and when they were occupied. Both sites are in good condition, with only slight evidence of modern disturbance. We recommend both sites be considered eligible for listing on the National Register of Historic Places on the basis of their information potential (Criterion D).

**Register Ineligible Resources:** The 30 isolated occurrences found during the survey are evaluated as having no historic values that warrant preservation. It is recommended they be considered ineligible for the National Register of Historic Places and the Arizona Register of Historic Places.

**Recommendations:** Two archaeological sites located within the footprint of the proposed facilities are significant because of their potential to yield important

information about the aboriginal settlement and subsistence strategies within the Harquahala Plain. Current design of the proposed facilities, the well field and the natural gas pipeline lateral, indicate that both sites have a high potential to be directly impacted by construction of these facilities.

We recommend that archaeological testing and, if warranted, data recovery studies be designed and implemented to mitigate impacts on both sites. If a need for additional facilities is identified, such as access roads beyond the surveyed areas, additional cultural resource surveys may be warranted.

If any human remains or funerary objects are unexpectedly discovered during project construction, they should be protected and reported immediately to the director of the Arizona State Museum in accordance with Arizona Revised Statutes § 41-865.

## ACKNOWLEDGMENTS

---

We are grateful to Kevin Geraghty of Allegheny for his assistance in puzzling out land ownership in the footprint of the facilities, and for obtaining permission from various land owners to survey across their property.

Randy Simpson and Jaime Wood of URS managed the project and coordinated all the field efforts, and we thank them for their efforts. Sebastian Chamorro and Kim Ryan endured numerous long, hot days in the field. Ron Savage produced all the report graphics, and Keryn Darr edited the report. We appreciate the effort all of these individuals put forth on our behalf.

## CHAPTER 1 - INTRODUCTION

---

The Allegheny Power Supply Company (Allegheny) proposes to construct a power plant and associated facilities approximately 75 miles west of Phoenix. Allegheny retained URS to conduct environmental studies to support their application to the Arizona Power Plant and Transmission Line Siting Committee for a Certificate of Environmental Compatibility (CEC). Additionally, since a portion of their proposed transmission line and pipeline cross portions of Arizona state trust land, the cultural resource studies were intended to support the Arizona State Land Department and Siting Committee in complying with state laws related to protection of archaeological and historical resources. This report documents the results of the cultural resource survey.

### PROJECT DESCRIPTION

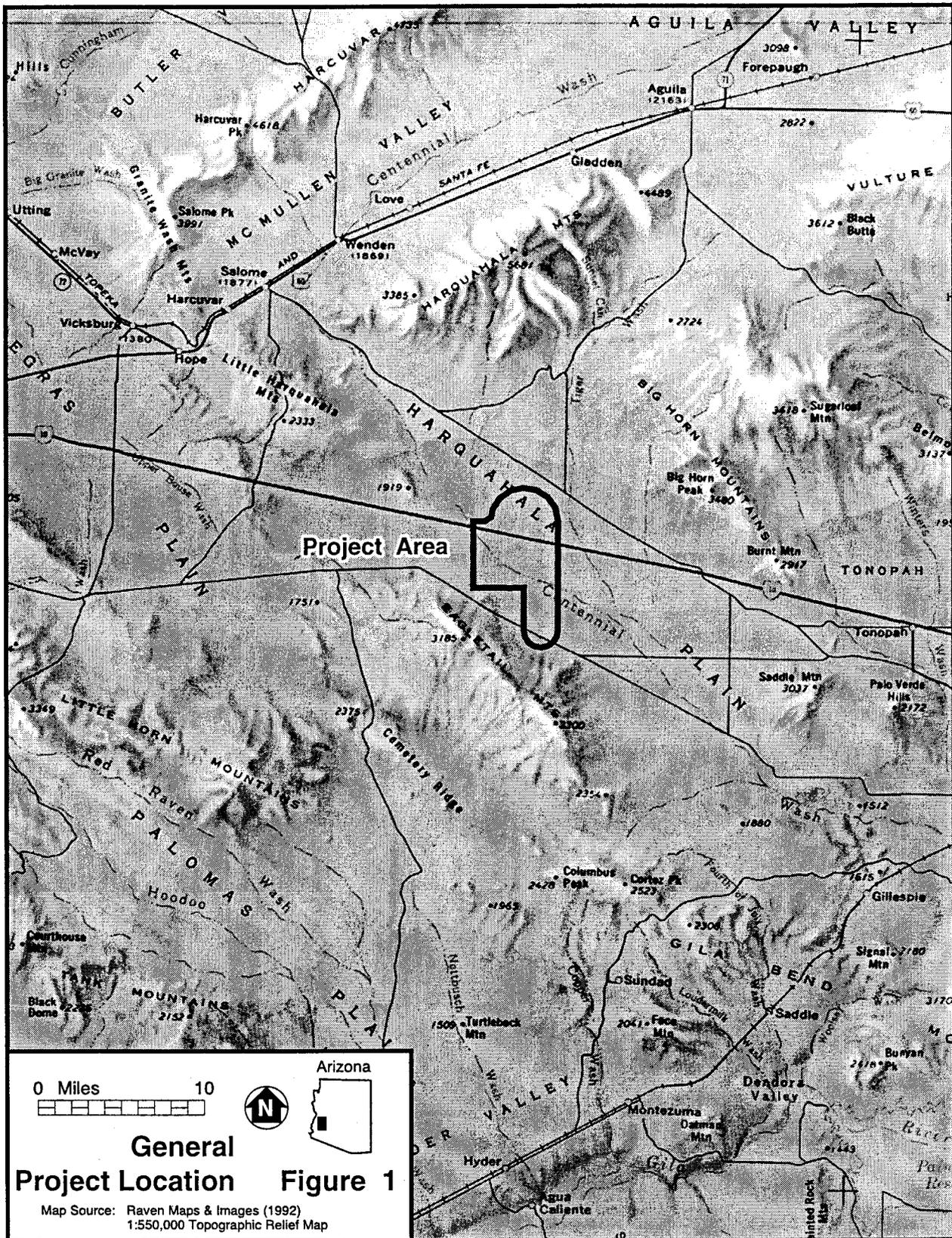
Allegheny is proposing to construct the La Paz Generating Facility. The project includes (1) a 1,080 megawatt power plant, (2) a 500-kilovolt (kV) interconnect line and switchyard that would provide access to the regional transmission grid by linking the plant to the existing 500kV Palo Verde-Devers transmission line, (3) a well field, and (4) a pipeline lateral that would deliver natural gas to the plant site from an existing El Paso Natural Gas (EPNG) pipeline south of Centennial Wash.

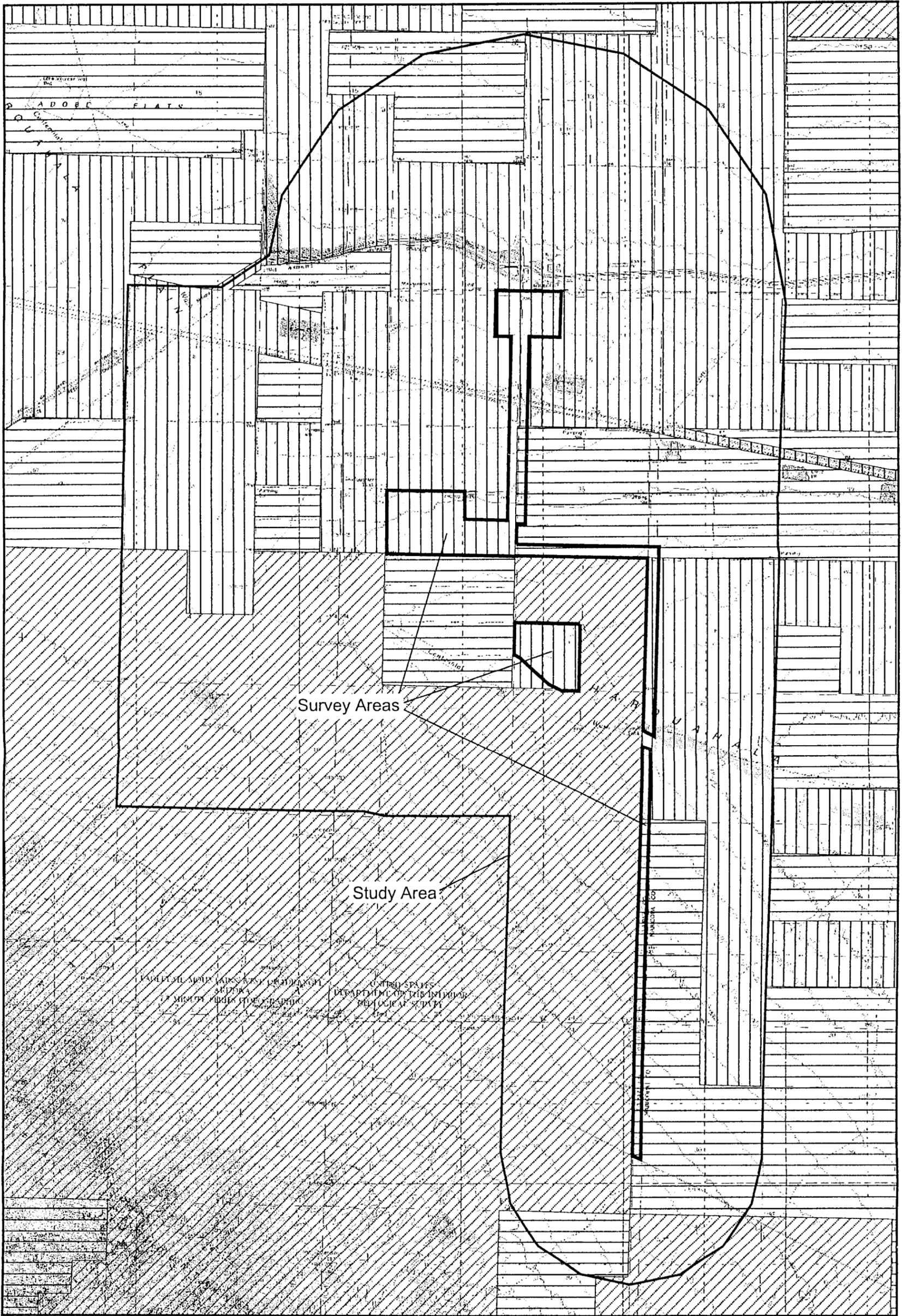
Soon after beginning the survey, Allegheny informed us that they were considering a second alternative to the locations of the transmission line and switchyard. Alternative A for each facility is located east of Avenue 75E, and Alternative B is located to the west.

### PROJECT LOCATION

The site of the proposed plant and associated facilities is approximately 75 miles west of Phoenix in eastern La Paz County and western Maricopa County (Figure 1). The proposed power plant is located on privately owned land in Section 35, Township (T) 3 North (N), Range (R) 11 West (W), Gila and Salt River Base Line and Meridian (Figure 2). Alternative A of the proposed switchyard is located in Section 25, and Alternative B in Section 26 of T3N, R11W. Both are located on privately owned land. The transmission line alternatives extend south through privately owned and Arizona state trust land from the switchyard locations, in Sections 25, 26, 35, and 36 of T3N, R11W. The well field is located on privately owned land in Section 1, T2N, R11W. The first "leg" of the pipeline, on Arizona state trust land, is oriented east-west, just north of the southern boundary of Section 36, T3N, R11W. The remainder of the proposed pipeline route extends south through privately owned and Arizona state trust land to the existing EPNG pipeline along the western edge of Sections 2, 7, 18, 19, and 30, T2N, R10W.

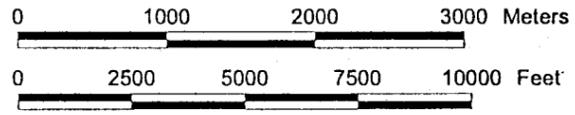
The project area, including a 1-mile buffer as part of the Class I research, is depicted on the Lone Mountain, Courthouse Well, Eagletail Mountains West, and Eagletail Mountains East U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles.





Jurisdiction source: ALRIS (1997)

- OWNER
-  BLM
  -  PRIVATE
  -  STATE TRUST



Land Ownership  
Figure 2

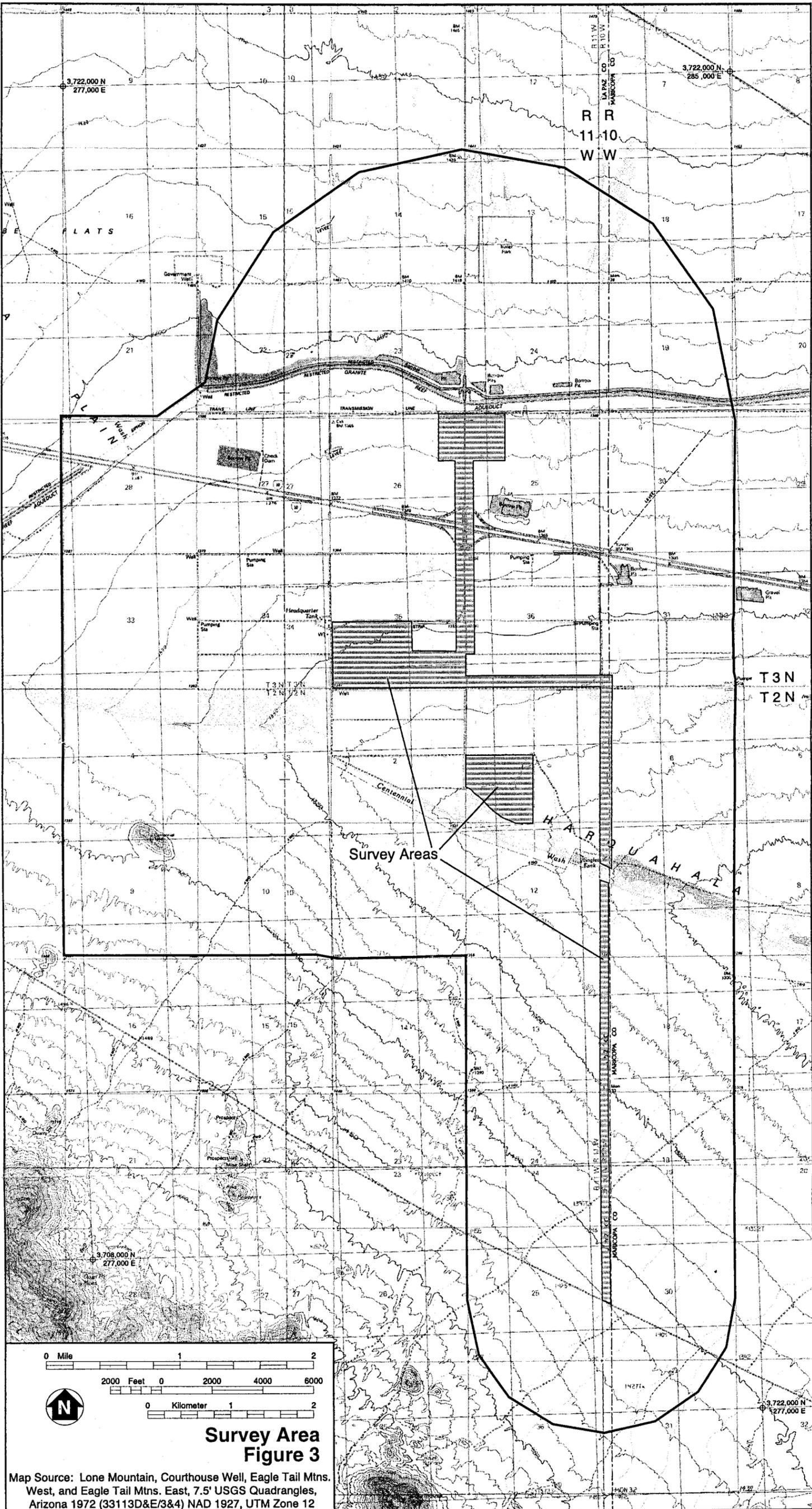
## SCOPE OF SURVEY

The proposed power plant site was defined as an L-shaped parcel encompassing approximately 267 acres (Table 1). The proposed switchyard (Alternative A) was defined as encompassing 10 acres. The transmission line connecting the switchyard with the power plant is approximately 1.75 miles long, and the survey corridor was defined as 500 feet wide. The proposed well field survey block encompasses an entire quarter section (160 acres). The pipeline survey corridor was defined as 200 feet wide.

<b>Unit</b>	<b>Length (feet)</b>	<b>Width (feet)</b>	<b>Acres</b>
Power Plant	5,400	1,350	267
	3,240	1,350	
Well Field	2,640	2,640	160
Switchyard (Alternative A)	660	660	10
Transmission Line (Alternative A)	9,420	500	108
Gas Pipe Line	29,295	200	135
<b>Total</b>			<b>680</b>

For a variety of reasons, the actual acreage surveyed is different than that proposed. For example, although the well field encompasses 160 acres, Centennial Wash extends through the southwest corner of the parcel. Dense mesquite growth along the wash prohibited adequate survey in that area. Additionally, crew size varied between three and four archaeologists during the survey, and reluctance to separate the crew led to larger corridors being surveyed in some areas. Figure 3 illustrates the areas surveyed, and Table 2 summarizes the acreage surveyed for each facility. As mentioned above, there are two alternatives for the locations of the switchyard and transmission line.

<b>Unit</b>	<b>Length (feet)</b>	<b>Width (feet)</b>	<b>Acres</b>
Power Plant	5,400	1,350	267
	3,240	1,350	
Well Field	--	--	135
Switchyard (Alternative A)	1,890	1,650	72
Switchyard (Alternative B)	1,840	930	39
Transmission Line (Alternative A)	9,420	500	108
Transmission Line (Alternative B)	9,420	500	108
Gas Pipe Line (north of Centennial Wash)	11,885	460	126
Gas Pipe Line (south of Centennial Wash)	17,410	330	132
<b>Total</b>			<b>987</b>



**Survey Area  
Figure 3**

Map Source: Lone Mountain, Courthouse Well, Eagle Tail Mtns. West, and Eagle Tail Mtns. East, 7.5' USGS Quadrangles, Arizona 1972 (33113D&E/3&4) NAD 1927, UTM Zone 12

5

In total, we surveyed about 987 acres. Approximately 777.5 acres are privately owned land and 209.5 acres are Arizona state trust land.

Sharon K. Bauer directed the field survey, and was assisted by archaeologists Penelope Taylor Baar, Kim Ryan, and Sebastian Chamorro. The fieldwork was conducted between 16 and 26 July 2001, requiring 25 field-person days of effort to complete. Dr. David E. Doyel served as principal investigator.

## **ENVIRONMENTAL SETTING**

Environmental parameters do not determine the course of human history, but can represent significant constraints and opportunities and are important factors to address in interpreting the history of human use of any given region. The environment of the project area is briefly described in this section to provide background and context for understanding the history of human occupation of the area.

### **Climate**

The climate of the project area is hot and arid. Annual precipitation averages only about 6 inches (15 centimeters), and rainfall occurs primarily during intense summer thunderstorms (Sellers and Hill 1974). Mean daily maximum temperatures during July, the hottest month, exceed 106 degrees Fahrenheit (°F) (41° C). The mean daily minimum temperature during January, the coldest month, is 31° F (0° C) (Sellers and Hill 1974).

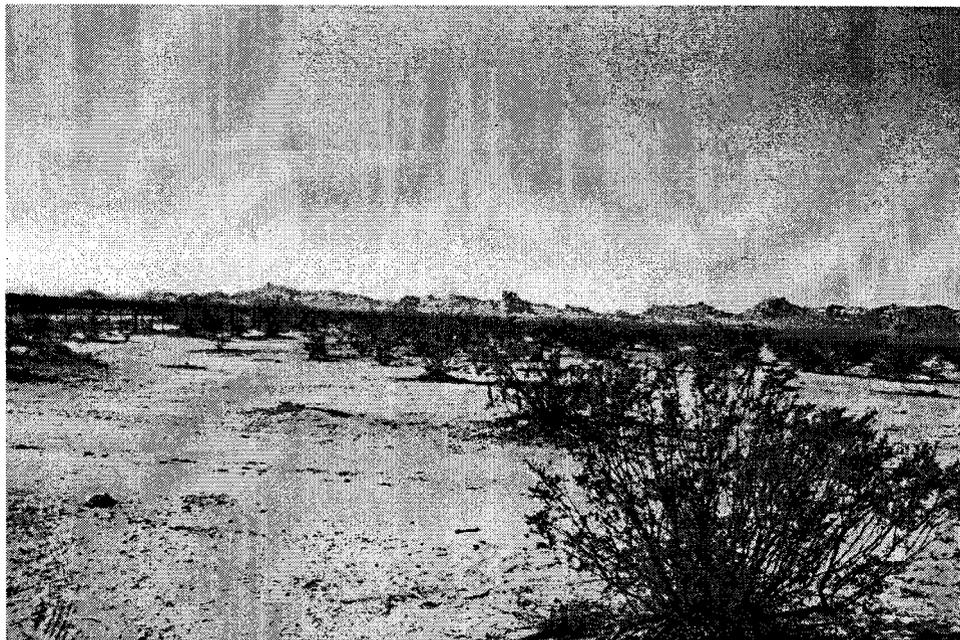
### **Physiographic Setting**

The project is in the Basin and Range Physiographic Province, which is characterized by steep, discontinuous, subparallel mountain ranges separated by generally broad, gently sloping alluvial valleys or basins. The project area is within the Harquahala Plain of the Sonoran Desert section of the Basin and Range Physiographic Province. The Harquahala Plain encompasses approximately 720 square miles (1,865 square kilometers), and lies at elevations of 1,200 to 1,400 feet (365 to 425 meters) above sea level. This valley floor is bounded by the Harquahala Mountains (5,681 feet) to the north, Eagle Tail Mountains (3,186 feet) to the west, Gila Bend Mountains (3,170 feet) to the south, and Big Horn Mountains (3,480 feet) to the east. The cores of these mountain ranges are Precambrian schist, gneiss, granite, and quartzite. Other exposed sedimentary and igneous rock types are dated to the Paleozoic and Mesozoic (Stone 1986).

The Harquahala Valley was formed by erosional processes that created coalescing alluvial and colluvial fans to form a bajada landscape. The valley bottom is covered by deposits of silt, sands, and gravels derived from alluvial fan material as well as floodplain and terrace deposits. The Centennial Wash drains the Harquahala Plain and joins the Gila River in the Arlington Valley. Winters Wash, draining the Tonopah Desert located north of the study corridor, flows south and joins Centennial Wash (Chronic 1983).

## Natural Vegetation and Wildlife

The project corridor is within the Sonoran Desertscrub Biome, which encompasses a large, arid region of southwestern Arizona, southeastern California, the Baja peninsula, and the state of Sonora, Mexico (Turner and Brown 1994). Parts of the project area have been intensively farmed (the agricultural fields in the project area now appear to have been abandoned), but the natural vegetation in the rest of the project area is characteristic of the Lower Colorado River Valley Subdivision, which is the hottest and most arid of the Sonoran Biome subdivisions. Creosotebush dominates the vegetation in most of the areas surveyed (Photograph 1). No vegetation was present in the fallow agricultural fields. The washes through the project area are lined with mesquite trees, which are extremely dense along Centennial Wash. Additional vegetation, such as cholla and saguaro, are present in small quantities in the lower bajada north of the Eagletail Mountains.



**Photograph 1: Overview of the transmission line corridor, Alternative B, showing creosotebush as the dominant vegetation. Courthouse Rock is in the center of the photo. View is to the south.**

Xeroriparian habitats are found in the Sonoran Biome along the dry washes that dissect the area. These intermittent flowing washes support a denser, multi-leveled vegetation including palo verde, ironwood, and mesquite trees, as well as crucifixion thorn, catclaw acacia, burrobush, desert broom, wolfberry, and canyon ragweed.

The coyote is the primary large mammal inhabiting the Lower Colorado River Valley Subdivision. Small burrowing mammal species, common in the sandy area of the creosote-bursage communities, include round-tailed ground squirrel, kit fox, white-tailed antelope squirrel, desert pocket mouse, and kangaroo rats.

Raptors include Harris hawks, red-tailed hawks, and golden eagles. Many unique amphibian and reptile species are present as well, including chuckwalla, rattlesnakes, and desert tortoise. Wildlife is more common along drainages that support xeroriparian habitat, which provides more opportunities for shelter, nesting, and feeding. Larger wildlife, such as mule deer, also may use washes as travel corridors.

## **CULTURAL HISTORY BACKGROUND**

Human use of the region extends back in time 12,000 years or more. Archaeology and traditional oral history provide the only evidence for most of that time period. After Europeans invaded the region written records also were generated, but the project area was never center stage to the focus of regional settlement and details of the history of the area remains sketchy. This section summarizes what is known about the general trends of human occupation of the region.

### **Pre-Columbian Occupations**

For approximately the first 10,000 years that human societies occupied the region, they lived by hunting game and collecting native plant foods. Populations remained small and dispersed. Archaeological excavations during the 1940s at Ventana Cave, located about 90 miles southeast of the project area, provided some of the best stratigraphic evidence in southwestern Arizona of these early Paleoindian and Archaic eras (Haury 1950). More recently, archaeological surveys undertaken prior to construction of the Palo Verde Nuclear Generating Station, Central Arizona Project aqueduct, and Harquahala Irrigation District distribution system resulted in the discovery of additional Archaic Period sites in the general region of the proposed project. Diagnostic late Archaic projectile points, including San Pedro, Amargosa, and Elko corner-notched styles, were found along Centennial Wash in the Harquahala Valley about 10 miles northwest of the proposed project site (Bostwick 1988; Stone 1986). Excavation at some of these sites revealed that they were shallow and the majority of artifacts and features were visible on the surface of the ground. Nevertheless, these sites demonstrate that hunter-gatherers exploited the seasonal plant and animal resources of the deserts of west-central Arizona for thousands of years.

About two to three thousand years ago subsistence strategies shifted to farming crops of corn, beans, squash, and cotton; regional populations grew; and larger, permanent settlements developed. The aboriginal farmers of this era in central Arizona are known as the Hohokam, and they became the most sophisticated canal irrigation agriculturists in North America. Hohokam villages along the Gila River extended west as far as the Gila Bend area to the south of the project area. Other farming societies along the lower Colorado River valley are known as the Patayan culture. Investigations prior to the construction of Painted Rocks Dam northwest of Gila Bend documented a mixture of Hohokam and Patayan sites (Wasley and Johnson 1965).

Some of the villages along the Gila River were quite large, and had public architectural features such as ball courts and platform mounds that probably were the focus of public ceremonies or other communal activities. However, there is little evidence of permanent settlement in the arid upland areas of west-central Arizona away from the Gila River Valley. Archaeological sites in these uplands tend to be surface scatters of artifacts representing briefly used camps and hunting and gathering locations (Brown and Stone 1982). The region was simply too dry to support agriculture except in very unique topographic situations that facilitated floodwater farming, such as along Fourmile Wash below Flatiron Mountain about 15 miles northeast of the project area (Sires 1989).

### **Ethnohistoric Occupation**

When Europeans first arrived in the area, they encountered a diversity of aboriginal groups in what is now southwestern Arizona. The two groups closest to the project area included the Yavapais and Maricopas. The Yuman-speaking Yavapais inhabited west-central Arizona north of the Salt and Gila rivers. A group that came to be known as the Maricopa lived along the lower Gila and Colorado river valleys. During the nineteenth century they migrated up the Gila River to join the Akimel O'odham (Pima), who were village-dwelling farmers living above the confluence of the Gila and Salt rivers. Other desert-dwelling O'odham groups, the Tohono and Hia-Ced, ranged primarily south of the Gila River.

### **Yavapais**

Gifford (1932, 1936) compiled the primary Yavapai ethnography, based on several months of field research in the 1930s. Schroeder (1974) compiled ethnohistoric data for the Yavapai land claims case in the 1950s. More recent ethnographic studies have focused on the Fort McDowell Reservation community (Khera 1977; Mariella 1983). Important early historic accounts include those of an army physician working at Fort Verde (Corbusier (1886), and observations made during General Crook's Indian campaign (Bourke 1891; also see Porter 1986). Khera and Mariella (1983) and Stone (1987:31) have compiled recent summaries of ethnohistoric and ethnographic research among the Yavapai.

Yavapais were often misidentified as Apaches during the ethnohistoric era, and often were referred to as Apache-Mojaves, Mojave-Apaches, or Apache-Yumans. These designations may reflect the cultural similarity of the Yavapais and Apaches, some of the interaction and intermarriage between Yavapais and Apaches (especially the Tonto band), and recognition of the linguistic affiliation of the Yavapais with Yuman speakers to the west (such as the Mojaves).

During the ethnohistoric era, the Yavapais occupied a large, approximately triangular territory stretching from near Flagstaff in the north, southeast to the Globe vicinity, and west to near Yuma. The Yavapai population in the 1860s was estimated to be about 1,500 to 2,000, but tribal oral history indicates this was greatly reduced from pre-contact levels by warfare and disease. Nevertheless, even earlier population densities were probably low, as is typical of hunting and

gathering societies, although the Yavapais also farmed at favorable locations, particularly in more upland areas where streams or springs provided sufficient water. Tribal oral history indicates much more horticultural activity than is generally attributed to the Yavapais. After planting their gardens, the Yavapais would leave to gather and hunt, returning to harvest the crops that had matured.

The Yavapais followed a seasonal round of movement from lowland deserts to upland chaparral and woodlands, to hunt and collect wild plant resources and tend their fields. The Yavapais lived in local groups or "camps" of up to 10 related households, and groups of camps formed bands. The bands were organized into three or four subtribes. The southwestern subtribe, the Tolkapaya, was the closest Yavapai group to the project area. The Tolkapaya periodically traveled to the Colorado River to plant crops, and during the 1850s and 1860s, some families joined the Cocopah after Euroamericans started to invade their territory (Khera and Mariella 1983:41).

During the 1800s, Yavapais were hostile toward O'odham groups living south of the Gila River, and the Hualapais located to the north between the Bill Williams and Colorado rivers. On occasion, the Yavapais also were hostile towards the Tonto Apaches to the east and incidents of "wife-stealing" were reported. However, relations with Apaches generally were cooperative, as they were with the lower Colorado River valley Mojaves and Quechans with whom the Yavapais traded frequently.

Hostilities between Yavapais and Euroamericans originated with the discovery of gold in the Prescott highlands in the 1860s. Some Yavapais were persuaded to move to the Colorado River Indian Reservation, but conflict intensified in the late 1860s. By 1871, the U.S. Army confined about 1,000 Yavapais to the military reservation at Camp Date Creek (Boles 1994). By 1873 the Yavapais were militarily defeated, with perhaps a loss of 15 to 30 percent of the tribal population. The surviving Yavapais were concentrated at Camp Verde, and in 1874 they were marched to the San Carlos Reservation, where they lived with Apaches for about 25 years. A few hundred Yavapais apparently escaped this incarceration and worked as laborers at mines in the Castle Dome Mountains (Bean and Vane 1978:5-70).

By 1900, many Yavapais had moved back to their old homeland along the Verde River, and only about 200 Yavapais remained at San Carlos. The 38.6-square-mile Fort McDowell Reservation was established on the lower Verde River in 1903. A small, 40-acre parcel also was set aside for the Yavapais near Camp Verde in 1910, and through small expansions in 1914, 1916, and in the 1950s, the parcel now totals 635 acres. Another small, 75-acre reservation was established near Prescott in 1935, and enlarged by 1,320 acres in 1956.

Today, there are approximately 800 enrolled members on the Fort McDowell Reservation. About 1,180 enrolled members live on the Camp Verde Reservation parcels, and about 130 enrolled members reside on the Yavapai-Prescott Reservation (Schell 1993).

## Maricopas

When Europeans first arrived in the area, the Maricopas resided in the Gila River valley southeast of the proposed project site and used adjacent uplands (Stein 1981a). Spier (1933) conducted the basic ethnographic research of the Maricopas, and subsequent research was undertaken for the Indian Claims Commission (Fontana 1958; Hackenberg and Fontana 1974). Other researchers have investigated the confusing origin of the Maricopas (Bean and Vane 1978; Dobyns and others 1963; Ezell 1963; Harwell 1979; Harwell and Kelly 1983; Kelly 1972).

Spanish accounts are limited and not entirely consistent, but almost 10 Yuman speaking groups were named as living along the lower Colorado River and lower Gila River. Two groups formed a powerful north-south alliance—the Quechans (also called Yumas) residing near the confluence of the Gila and Colorado rivers, and the Mojave who lived farther upstream along the Colorado River.

Numerous other, and apparently smaller, groups were part of a more general east-west alliance. Starting at the Colorado River delta, these groups included the Cocopahs, Halyikwamis, and the Kohuanas all living south of the Quechans, and the Halchidomas situated between the Quechans and Mojaves. Allies along the lower Gila River included the Kaveltcadoms, and farther upriver the Cocomaricopas and the Opas. Some researchers have concluded that Halchidomas, Kaveltcadoms, Cocomaricopas, and Opas were simply geographical units of a single cultural group, which they refer to as the Panya.

The population of the Panya probably was on the order of about 5,000 in the 1700s. The Panya lived in dispersed settlements (*rancherías*), similar to other Yuman speaking groups along the lower Colorado River. They hunted and exploited wild plant foods, but also fished and farmed with floodwater techniques.

The name “Cocomaricopa” may be the Spanish transliteration of the Akimel O’odham name for a group that lived near modern day Gila Bend—*Kokomalik Aapap*. Aapap means “friendly enemies,” a seeming oxymoron that made sense to the Akimel O’odham who lived to the east along the Gila River above the Salt River confluence and were enemies of the two strongest Yuman groups—the Quechans and Mojaves. Kokomalik refers to the Gila Bend Mountains. So, “Maricopa” may be derived from Spanish observers shortening the Akimel O’odham name for the “friendly enemies of the Gila Bend Mountain area.” Alternatively, some researchers have suggested that Maricopa evolved from the Spanish word “mariposa,” or butterfly, which might have been used to describe the brightly painted Indians.

Whatever its origin, Maricopa was first applied in about 1839 to label an amalgam of the various remnants of the Panya who had absorbed the Kohuanas and Halyikwamais by that time. The groups of Panya had been driven from the lower Colorado and lower Gila River valleys by increased pressure from the Mojaves and Quechans, perhaps stimulated by the arrival of mountain men in search of furs or new markets for slaves in Mexico. The fleeing Panya took up residence in south-central Arizona adjacent to the Akimel O’odham on the Gila River above its confluence with the Salt River and became known collectively as the Maricopa. The Halchidoma first fled to Sonora and resided there for several years before returning to the Gila Valley to join

their relatives. The Maricopas adopted aspects of Hispanic culture, including cattle, horses, mules, wheat, and possibly barley. Some Maricopas spoke Spanish well, serving as interpreters for the Akimel O'odham (Harwell and Kelly 1983:75).

In the 1840s, U.S. Army battalions traveling to California passed through the Akimel O'odham and Maricopa villages, purchasing food from them. After the discovery of gold in California, about 60,000 "Forty-niners" crossed Arizona along this trail, creating a huge market for the Gila River farmers, who raised and sold three crops of wheat during 1849. In the 1850s, travelers on stage lines, including the Butterfield Stage, also took advantage of the "roadside groceries" offered by the Akimel O'odham and Maricopa Indians.

The Akimel O'odham and Maricopas never fought the Americans, and in 1859 the federal government set aside the first reservation in Arizona for their use. The Akimel O'odham and Maricopas, in fact, joined the U.S. Army troops in fighting their common enemies, the Apaches and Yavapais. Despite putting their lives on the line, the Akimel O'odham and Maricopas were ill rewarded. American farmers settled on the Gila River in the Florence and Safford areas upstream of the Akimel O'odham and Maricopas, and began building their own irrigation canals. The Americans diverted so much of the river flows that by 1871 the Akimel O'odham and Maricopa fields were left dry. The natives refer to the subsequent half century as the "years of famine." Some Akimel O'odham and Maricopas moved north to the Salt River, where a reservation was established in 1879, and others moved to the confluence of the Salt and Gila rivers.

Today, the Maricopas continue to reside primarily in two communities. There are approximately 5,400 enrolled tribal members at the 87-square-mile Salt River Reservation, of which approximately 100 are Maricopas (who designate themselves as Halchidomas) concentrated in the Lehi area. There are approximately 11,600 enrolled tribal members on the 583-square-mile Gila River Reservation, of which about 600 are Maricopas, concentrated in the Laveen area in the northwestern corner of the reservation (Schell 1993).

### Euroamericans

The project area was bypassed throughout the more than three centuries of Spanish and Mexican eras. The pace of settlement quickened when the United States acquired the territory at the conclusion of the 1846-1848 Mexican War, but it was not until the late nineteenth century that Euroamericans first established ranches in the general vicinity of the proposed project.

E.H. Winters owned a ranch in the area from 1885 to 1925, and was later memorialized when the town of Wintersburg was established near a well on the ranch (Granger 1983:681). Wintersburg warranted a post office only from 1930 to 1941, and a post office was established in Tonopah in 1934. There was a brief flurry of homesteading activity in the Palo Verde Hills area between the early 1920s and the mid-1940s. The earliest of these homesteaders were World War I veterans who had hopes of receiving government-sponsored aid for irrigation projects. These hopes were never fulfilled, and most attempts to rely on floodwater farming and wells failed. Some attempts at homesteading were fraudulent schemes to acquire lands for speculation (Stein 1981b). Most of

the homesteaders who managed to obtain patents left after establishing their claims. Historic remains of early farming and ranching attempts are relatively abundant on the plains around the Palo Verde Hills. They usually consist of a concrete house foundation slab, an abandoned well, animal pens, and scattered trash (Trott 1974).

Today, portions of the project area remain undeveloped, but other areas are abandoned agricultural fields. To the east of the project area, large parcels of land are being offered for residential development.

## CHAPTER 2 - RECORDS REVIEW (CLASS I SURVEY)

---

Records were reviewed at the following agencies and research institutions:

- State Historic Preservation Office (SHPO)
- Arizona State Museum (ASM)
- Phoenix Field Office of the Bureau of Land Management (BLM)
- State Office of the BLM
- Department of Anthropology, Arizona State University

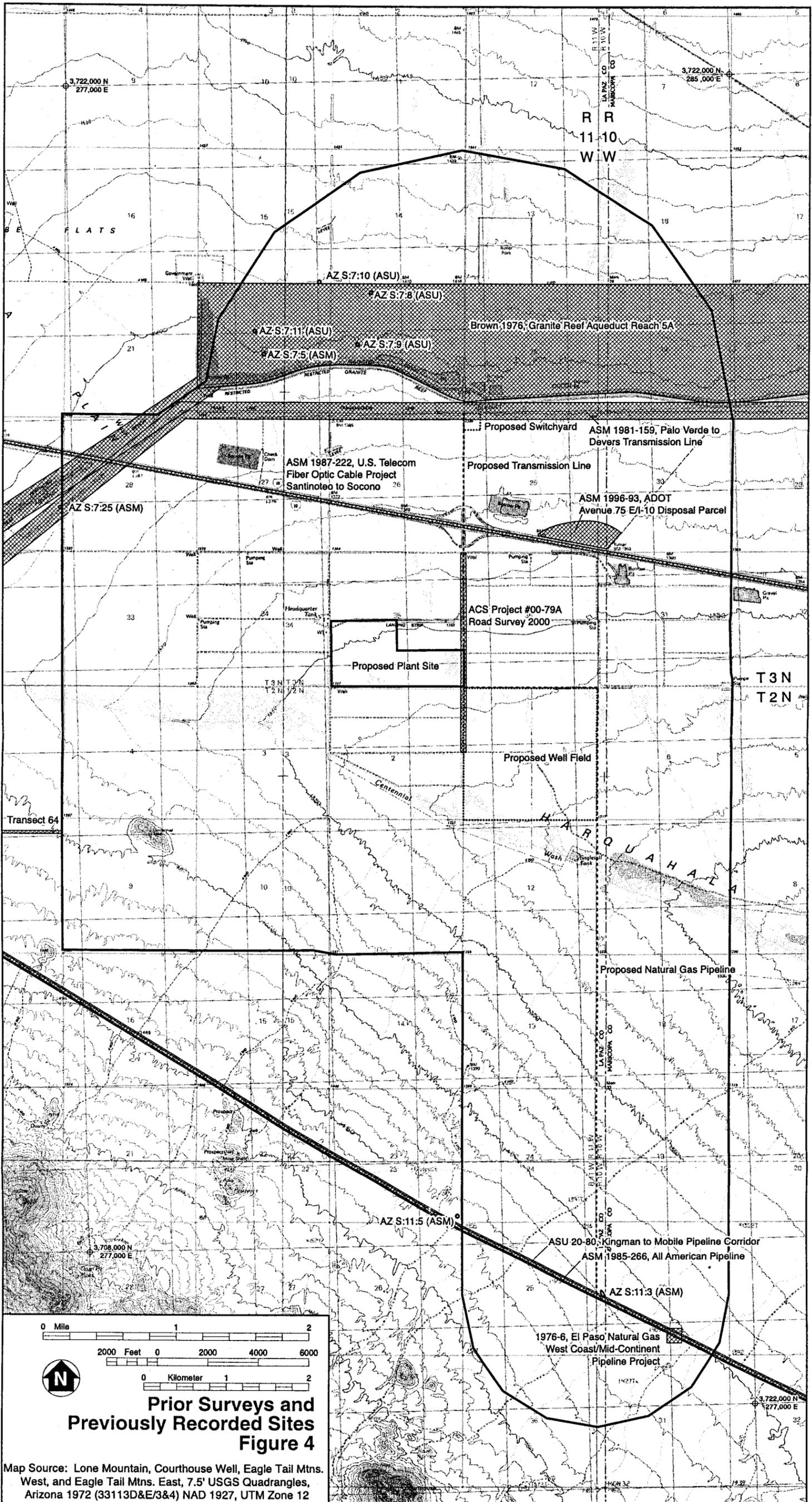
The goal of the review was to identify prior cultural resource studies and previously recorded archeological and historical sites within approximately 2 miles of the project area. This information has been presented in a separate document prepared prior to the field survey in support of the CEC application (Doyel and others 2001).

### PRIOR CULTURAL RESOURCE STUDIES

Archaeological and historical studies have been conducted in support of eight projects within 2 miles of the proposed La Paz Generating Facility (Figure 4; Table 3).

The most extensive studies were conducted during the planning of the Hayden-Rhodes Aqueduct (formerly known as the Granite Reef Aqueduct), a component of the Central Arizona Project. The initial investigation of the feasibility alignment for the aqueduct was a reconnaissance conducted by helicopter (Euler 1968). Subsequently, a 600-foot-wide corridor was intensively surveyed along the feasibility alignment (Kemrer and others 1972). Thirty-two archaeological sites were recorded, but only one of these is within the records search area, and all of the artifacts at this small site were collected. Prior to construction, realignments of Reach 5A of the aqueduct, north of the proposed La Paz Generating Facility, were examined and only isolated artifacts were found (Rogge 1976). Intensive survey of about 3.4 square miles within a flood detention basin, built to protect the aqueduct, discovered 10 archaeological sites (Brown 1976a), and studies of some of those were undertaken to mitigate construction impacts (Brown 1976b; Brown and Stone 1982). Four of those 10 sites are within the records search area, but all are north of the proposed facilities.

The next most extensive surveys in the records search area were conducted for the Palo Verde-Devers 500kV transmission line. In the late 1970s, sample surveys were conducted along alternative routes then being evaluated (Berry 1978). This survey covered about 9,200 acres. We could not determine what part of the records search area was encompassed by this survey, but it apparently involved only a narrow transect along the EPNG pipeline. One archaeological site was recorded by this survey near the southern end of the proposed natural gas pipeline lateral. In the early 1980s, the route of the transmission line selected for construction was intensively surveyed. A total of 159 sites were found along the Arizona segment of the corridor (Carrico and Quillen 1982). None of these sites are within the records search area, although several are just to the west. In the late 1980s, a supplemental survey was conducted for the then proposed but never



**Prior Surveys and  
Previously Recorded Sites  
Figure 4**

Map Source: Lone Mountain, Courthouse Well, Eagle Tail Mtns. West, and Eagle Tail Mtns. East, 7.5' USGS Quadrangles, Arizona 1972 (33113D&E/3&4) NAD 1927, UTM Zone 12

built Palo Verde-Devers #2 line (Swartz and Dongoske 1987). None of the 37 archaeological sites encountered are within the records search area.

**TABLE 3  
PRIOR STUDIES IN THE VICINITY OF THE  
LA PAZ GENERATING FACILITIES PROJECT**

<b>Project Name</b>	<b>Scope</b>	<b>Sites</b>	<b>Reference</b>
Granite Reef Aqueduct, Central Arizona Project surveys ASM 1972-5	1968: helicopter reconnaissance; 1972: 600 ft x 182 mi (12,236 acres); Rogge 1976: 225 acres; Brown 1976a, 1976b: 2,150 acres	1972: 32 sites, AZ S:7:5 (ASM) in project vicinity, 1976: 10 sites, 4 in project vicinity: AZ S:7:8 (ASU) AZ S:7:9 (ASU) AZ S:7:10 (ASU) AZ S:7:11 (ASU)	Brown 1976a, 1976b Brown and Stone 1982 Euler 1968 Kemrer and others 1972 Rogge 1976
El Paso Natural Gas Company West Coast/Mid-Continent Pipeline Project ASM 1976-6	90 acres	none	Lensink 1976
Palo Verde to Devers transmission line alternate corridors survey BLM 10-84, MNA-A76-47	~9,200 acres	25 sites, AZ S:11:3 (ASM) in project vicinity	Berry 1978
Palo Verde to Devers transmission line survey ASM 1981-159	200 ft x 110 mi (2,667 acres)	159 sites, none in project vicinity	Carrico and Quillen 1982
Palo Verde-Devers #2 transmission line survey	597 locations along 110-mile-long route	37 sites, none in project area	Swartz and Dongoske 1987
Kingman to Mobile Pipeline survey ASU 20-80	100 ft x 207 mi (2,509 acres)	24 sites, none in project vicinity	Henss 1983
All American Pipeline survey ASM 1985-26, BLM 9-58/10-182	200 ft x 240 mi (5,818 acres)	32 sites, none in project vicinity	Batcho 1985 Higgins and Brunson 1985
U.S. Telecom fiber optic cable ASM 1987-222	862 acres	none	O'Brien and others 1987
ADOT Avenue 75E/I-10 disposal parcel survey ASM 1996-93	75 acres	none	Stone 1996
Harquahala Valley road survey ACS 00-79A	11 acres	none	Crownover 2000

An ethnographic study also was conducted in support of the planning of the Palo Verde-Devers transmission line (Bean and Vane 1978). Maricopas and Yavapais who were interviewed identified traditional cultural associations with the Little Horn Mountains, Eagletail Mountains, and Courthouse Rock. Yavapais also identified plants traditionally used for food and medicine in the creosotebush vegetation communities of the Ranegras Plain and Harquahala Plain. The proposed La Paz Generating Facility is on the Harquahala Plain and will result in some disturbance of native vegetation although much of the project area already has been altered by agricultural development. The project is not expected to have impacts on any of the other places identified as having traditional cultural associations.

Several other surveys have been conducted for pipeline projects. One was for the EPNG West Coast/Mid-Continent pipeline through the southern part of the records search area. This survey encompassed nine 10-acre plots, but only one of these was in the records search area. The survey found no archaeological or historical sites (Lensink 1976). Henss (1983) surveyed a corridor parallel to the EPNG pipeline for a once proposed but never built Provident Energy Company pipeline. Twenty-four archaeological sites were recorded along the corridor, but none are in the records search area. Another survey was conducted parallel to the EPNG pipeline for the All-American Pipeline. Thirty-two archaeological sites were found along a 240-mile-long segment across southwestern Arizona, but none are in the records search area (Batcho 1985; Higgins and Brunson 1985).

Another survey was conducted for a U.S. Telecom fiber optic cable right-of-way along Interstate 10 (O'Brien and others 1987). Stone (1996) surveyed a 75-acre parcel east of the intersection of Interstate 10 and Avenue 75E. Crownover (2000) surveyed approximately 1.5 miles of road right-of-way along Avenue 75E south of Interstate 10 at Exit 69. None of these surveys found any archaeological or historical sites within the records search area.

## **PREVIOUSLY RECORDED CULTURAL RESOURCES**

Only six archaeological sites have been recorded within the records search area (Table 4, refer to Figure 4). None are within the footprint of the proposed project facilities.

All of the sites reflect aboriginal use of the area, but none of the sites yielded materials that could be chronometrically dated. The Gila Butte and Santa Cruz ceramics at site AZ S:7:10 (ASU) suggest a date of occupation between approximately A.D. 700 and 900 (Dean 1991) and the Colorado Beige ceramics at site AZ S:11:3 (ASM) can be dated between about A.D. 700 and 1050 (Waters 1982). One site also has some historic era trash of undetermined origin.

The sites are all quite simple, consisting of only a few artifacts and simple rock alignments that may be remnants of temporary shelters or rock clusters, some of which may be remnants of hearths or cooking pits. Some hearths or pit features might have buried deposits, but the sites are primarily confined to the surface of the ground and extensive buried archaeological deposits have not been found at these types of sites. As a group, the sites seem to reflect sporadic exploitation of the natural resources of the region, and probably are related to hunting game or collecting and processing indigenous plant foods such as mesquite and palo verde seeds and cactus fruits. Other types of archaeological sites reported in the region include petroglyphs and trails visible across areas of desert pavement, as well as historic trash dumps and remnants of historic farmsteads.

Site AZ S:11:3 (ASM) is depicted as being present at the southern end of the proposed pipeline, but we did not encounter any indications of it. The site was described as a scatter of about two Lower Colorado Beige sherds from a single vessel, and one piece of flaked stone (Berry 1978). One sherd was collected at the time of recording, presumably to facilitate type identification in the laboratory or office. The site actually might be located just east of our survey corridor.

**TABLE 4**  
**PREVIOUSLY RECORDED SITES IN THE VICINITY OF THE**  
**LA PAZ GENERATING FACILITIES PROJECT**

Site Number	Description	Status	Reference
AZ S:7:5 (ASM)	scatter of ground stone tool fragments (manos and metates) and rock clusters	all artifacts collected	Kemrer and others 1972
AZ S:7:8 (ASU)	two concentrations of apparently thermally altered cobbles, 5 ground stone fragments (metates)	avoided and not further studied	Brown 1976a, 1976b
AZ S:7:9 (ASU)	semi-circular cobble alignment, no artifacts	data recovery studies completed	Brown 1976a, 1976b
AZ S:7:10 (ASU)	scatter of 86 ceramic sherds (Gila Plain, Gila Butte Red-on-Buff, and Santa Cruz Red-on-buff), 7 manos, 3 pieces of flaked stone; historic trash	sherds collected; site avoided and not further studied	Brown 1976a, 1976b
AZ S:7:11 (ASU)	semi-circular cobble alignment, 4 pieces of ground stone, 8 ceramic plain ware sherds and 2 pieces of flaked stone	data recovery studies completed	Brown 1976a, 1976b
AZ S:11:3 (ASM) AZ S:11:2 (MNA) NA 14,787 AZ S:11:5 (BLM)	scatter of ~20 ceramic sherds (Lower Colorado Beige, single vessel) and 1 piece of flaked stone	1 sherd collected, no further study	Berry 1978

## SURVEY EXPECTATIONS

The records search revealed archaeological and historical resources are not abundant in the vicinity of the proposed La Paz Generating Facility. Only six archaeological sites have been recorded within an aggregate of about 4 square miles that have been surveyed. The archaeological sites that were found are all relatively small and simple, reflecting limited aboriginal exploitation of the Harquahala Plain.

Although the prior archaeological and historical studies have encompassed very little of the footprint of the proposed La Paz Generating Facility, they constitute approximately a 10 percent sample of the records search area. The prior studies may not be a fully representative sample, but the six recorded archaeological sites suggest an average of about one to two archaeological sites per square mile can be expected. The footprint of all the project facilities would encompass 1.5 to 2.0 square miles. Therefore, it can be estimated that about one to four archaeological sites might be present within the footprint of the project facilities.

To gauge the potential for Euroamerican resources, historic maps of the project area were reviewed. The project area overlaps parts of four townships—T2 and 3N and R10 and 11W. The General Land Office (GLO) first surveyed T2N, R10W and T3N, R11W in 1914. T3N, R10W

was surveyed in 1915. The GLO did not survey T2N, R11W until 1934. These relatively late dates reflect the lack of interest in settlement and development of this arid, remote area.

Few cultural features are depicted on the GLO plats of these townships. A dry well is shown about 2 miles north of Centennial Wash in Section 5 of T2N, R10W. The well is not associated with any roads or other cultural features and probably reflects ranching activities. There are five road segments depicted on the 1914 and 1915 plats. One of these follows Centennial Wash, and three of the four others generally extend in a parallel northwest-southeast direction. Only one of these is named, and it is identified as extending between Phoenix and Harrisburg. Harrisburg was a mining town on the north side of the Harquahala Mountains. The town (originally known as Oroville and then Centennial, and finally Harrisburg) warranted a post office from 1880 to 1906 (Granger 1983:290). Captain Charles Harris and his partner Frederick A. Tritle operated a five-stamp mill in Harrisburg to process ore from nearby mines.

Another mining camp known as Harquahala, at the southwestern end of the Harquahala Mountains, was located along the road to Harrisburg about 15 miles north of the proposed site of the La Paz Generating Facility. This camp "boomed" in 1888, but most of the claims were exhausted in less than a decade. The community had a post office from 1891 to 1918, but sporadic mining continued in the area until about 1932 (Granger 1983:290).

The 1934 survey for T2N, R11W depicts two houses and what appears to be another outbuilding where Centennial Wash crosses the boundary of Sections 1 and 2. Potable water probably could have been obtained from relatively shallow wells at this location. No roads are shown as providing access to these buildings, but a road undoubtedly extended along Centennial Wash. There are numerous other unnamed road segments shown in the area south of Centennial Wash and north of the foothills of the Eagletail Mountains. No cultural features are shown along these roads, which probably supported ranching activities.

The early GLO plats indicate little historical development of the region. Only two cultural features are within the footprint of the proposed La Paz Generating Facility. One of the houses depicted on the 1934 plat is within the proposed well field. It is not known whether any evidence of this building remains intact. The natural gas pipeline would cross the alignment of the unnamed road that was depicted on the 1914 GLO plat extending along Centennial Wash. Floods very well may have obliterated evidence of this road at this crossing.

In summary, if significant archaeological or historical sites are present in the well field or along the transmission line corridor, there is good potential to avoid direct impacts by minor project design modifications. If significant resources could not be avoided, those impacts could be mitigated by undertaking studies to recover important information prior to construction.

## CHAPTER 3 – FIELD SURVEY (CLASS III SURVEY)

---

### FIELD SURVEY METHODS

The survey crew identified the project area and survey units using 7.5-minute USGS topographic quadrangles and an aerial photograph of the project area (Figure 5). The three- to four-person team of archaeologists inspected the entire survey parcel by walking observational transects at intervals of 65 feet (20 meters) or less. The survey area was relatively flat and easily traversed. Vegetation was generally sparse, making it easy to inspect the ground surface for artifacts and features.

A GeoExplorer II global positioning system (GPS) unit was used to map the corners of the survey areas, prominent roads, survey markers, and sites and isolated occurrences of cultural materials. This system has an accuracy of  $\pm 5$  meters with differential correction.

ASM guidelines were used in designating archaeological sites and defining their boundaries. ASM Administrative Rules (Chapter 8-201.A.3) implementing the Arizona Antiquities Act (ARS 41-841, et seq.), define an archaeological site as:

any area with material remains of past Indian or non-Indian life or activities that are of archaeological interest, including without limitation, historic or prehistoric ruins, burial grounds, and inscriptions made by human agency.

The ASM Site Recording Manual (version 1.1, page A-7) defines remains of archaeological interest as one or more archaeological features, which are, in turn, defined as:

Physical remains of past human activity which are at least 50 years old and which are distinguished by boundaries that are based entirely on observable variations in the spatial distribution of the remains. Features include passive accumulations of artifacts, such as artifact concentrations, as well as purposeful constructions, excavations, or deposits.

An artifact concentration is defined as “thirty or more artifacts within an area measuring no more than 50 feet (15 meters) in diameter, except in cases where the artifacts clearly originated from the same item.”

Additional guidance is provided by an ASM letter dated 1 October 1994 that identifies other situations that may warrant designations as an archaeological site, including 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 temporal association with any number of artifacts
- two or more temporally associated archaeological features without artifacts

The ASM guidelines also recognize that other particular circumstances may warrant designation as an archaeological site, and encourage archaeologists to use professional judgment to make appropriate field decisions.

When sites were located, ordinarily they were only briefly examined and marked and the surveyors proceeded to complete the walkover of the entire survey parcel. The crew then returned to undertake more detailed recording, using ASM site forms as the primary documentation. Recording procedures included the following:

- intensively inspecting the site surface to identify features and define site boundaries
- making detailed surface observations about artifact numbers, types, and distribution
- preparing site sketch maps
- taking photographs and illustrating potentially diagnostic artifacts

No artifact collections were made and no subsurface testing was undertaken during the survey.

Findings of cultural materials resources that did not meet the criteria for designation as archaeological sites were recorded as isolated occurrences. Complete descriptions of isolated finds, including artifact types and materials, were recorded and their locations were plotted using the GPS unit.

## **SURVEY RESULTS**

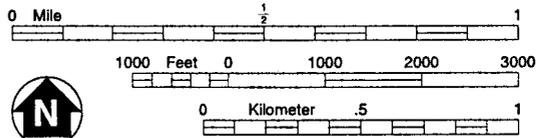
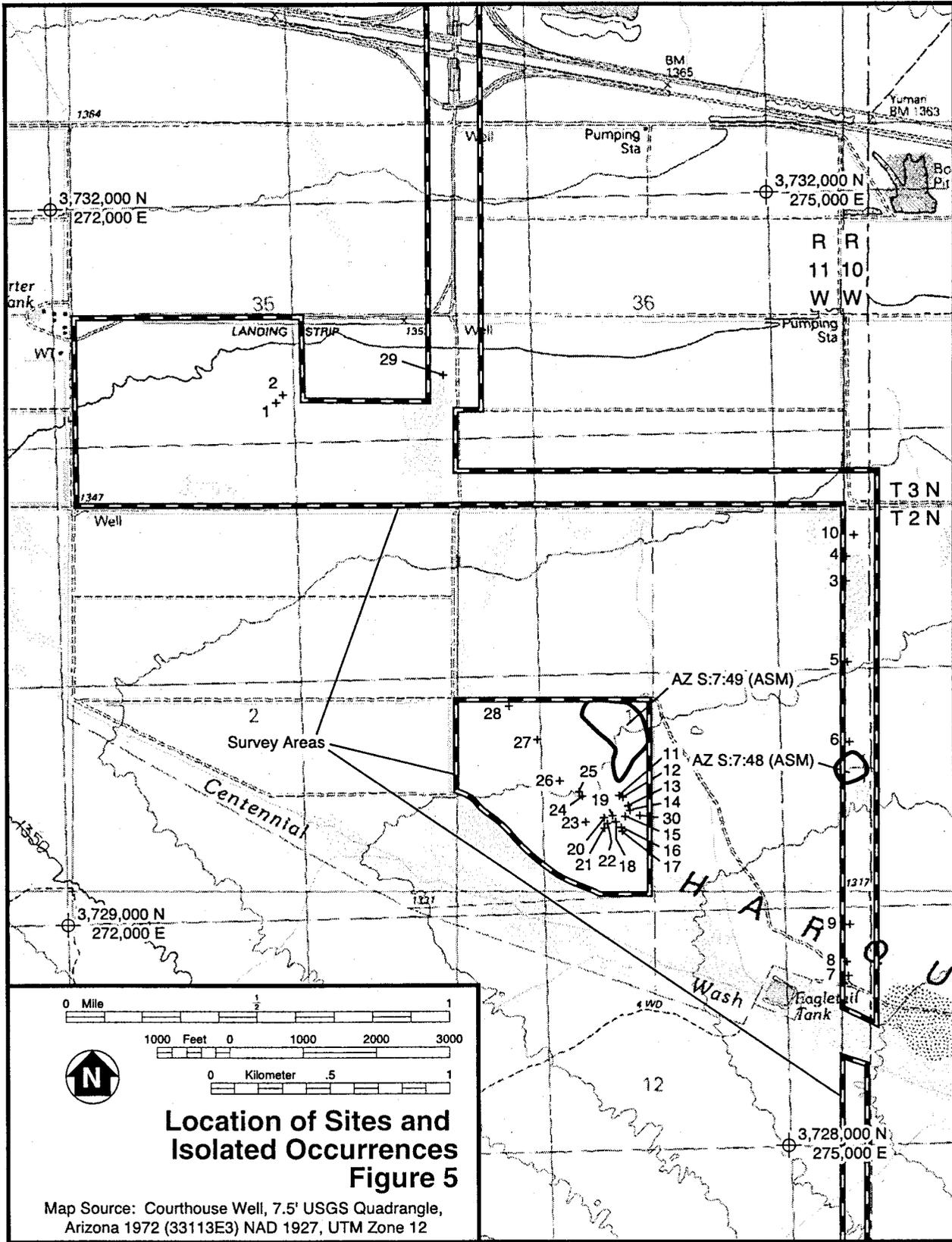
The survey crew found and recorded two prehistoric archaeological sites and 30 isolated occurrences of archaeological materials (Figure 5). The following sections describe and evaluate these resources. Completed ASM site cards for sites AZ S:7:48 and 49 (ASM) are provided in Appendix A.

### **Site AZ S:7:48 (ASM)**

Site AZ S:7:48 (ASM) is a large, low-density scatter of prehistoric artifacts (Figure 6) located on privately owned land in Section 6, T2N, R10W (Courthouse Well 7.5-minute USGS quadrangle, 1990 provisional edition). The Universal Transverse Mercator (UTM) coordinates for the site datum are N 3713598, E 283282.

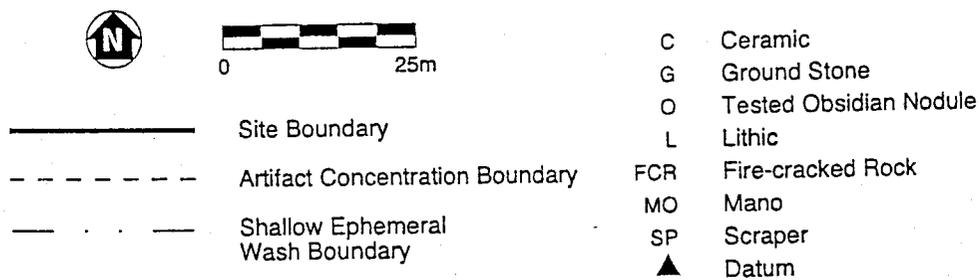
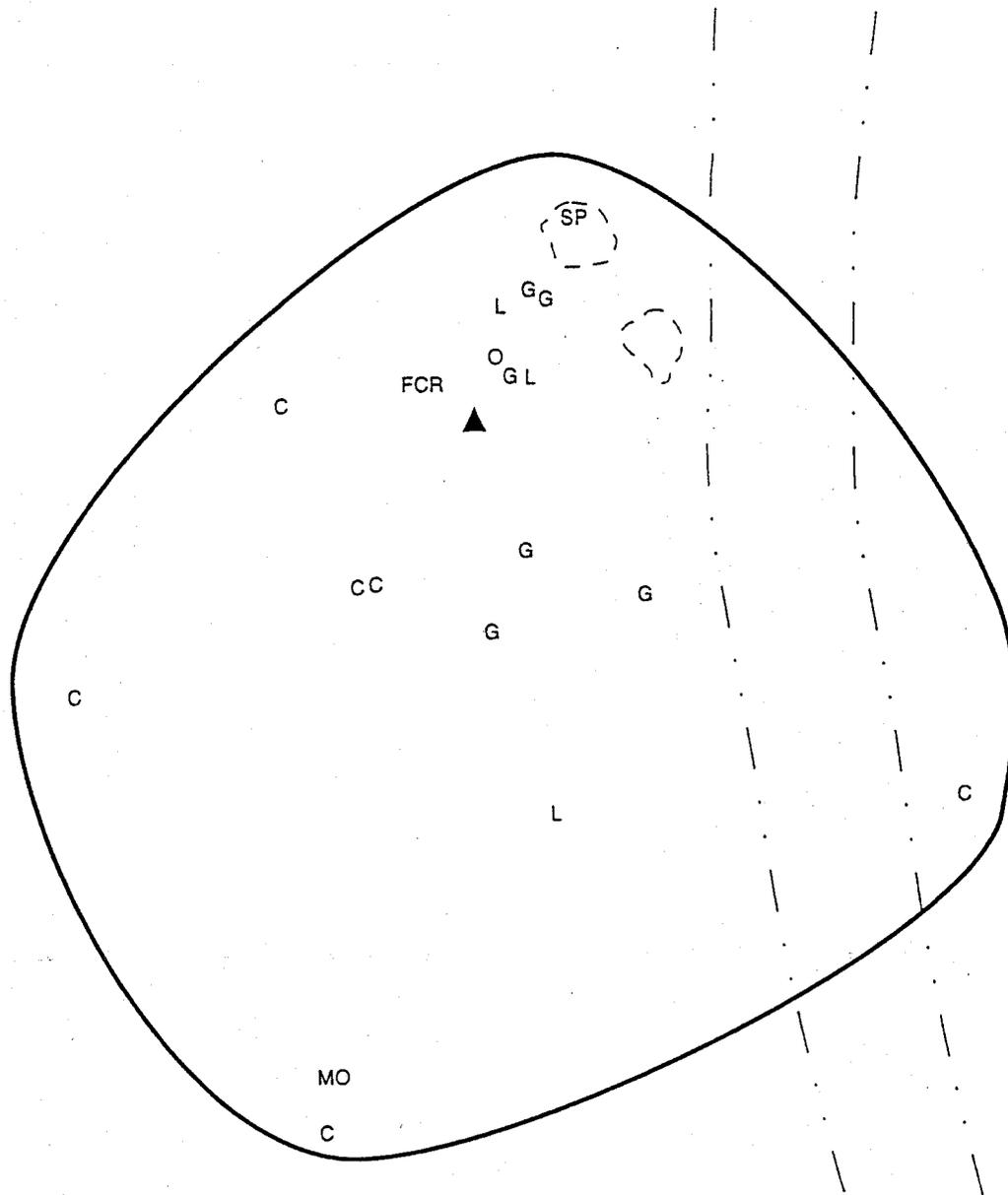
### **Environmental Setting**

The site is situated on the Harquahala Plain less than 1 mile north of Centennial Wash at an elevation of 1,323 feet above sea level. It is bounded on the east by a narrow, shallow erosional



**Location of Sites and Isolated Occurrences  
Figure 5**

Map Source: Courthouse Well, 7.5' USGS Quadrangle, Arizona 1972 (33113E3) NAD 1927, UTM Zone 12



Map of Site AZ S:7:48 (ASM) Figure 6

channel lined by occasional mesquite trees. The surface of the site has been slightly affected by recent flooding of Centennial Wash.

### **Surface Observations**

Site AZ S:7:48 (ASM) encompasses an area measuring approximately 130 meters by 130 meters (about 4 acres). Artifacts observed include chipped and ground stone, ceramics, and possible fire-cracked rock (FCR). No diagnostic artifacts or features were observed.

We tallied all artifacts identified on the site surface. Chipped stone artifacts include one brown chert thumbnail scraper, one obsidian tested nodule, one chert flake and two rhyolite flakes. Ground stone includes four metate fragments and two indeterminate fragments of vesicular basalt. Seven additional vesicular basalt fragments that might be FCR were counted. We counted 54 sherds on the site surface, 35 of which are buff wares. Additionally, we identified 15 sand-tempered plain ware sherds and 4 red-on-buff sherds. Unfortunately, the red-on-buff sherds were so eroded, design types could not be discerned. Because many of the sherds are very small, some of the buff wares might actually be unpainted fragments of red-on-buff vessels. The total artifact count represents a density of only 0.004 item per square meter.

### **Evidence of Site Age and Function**

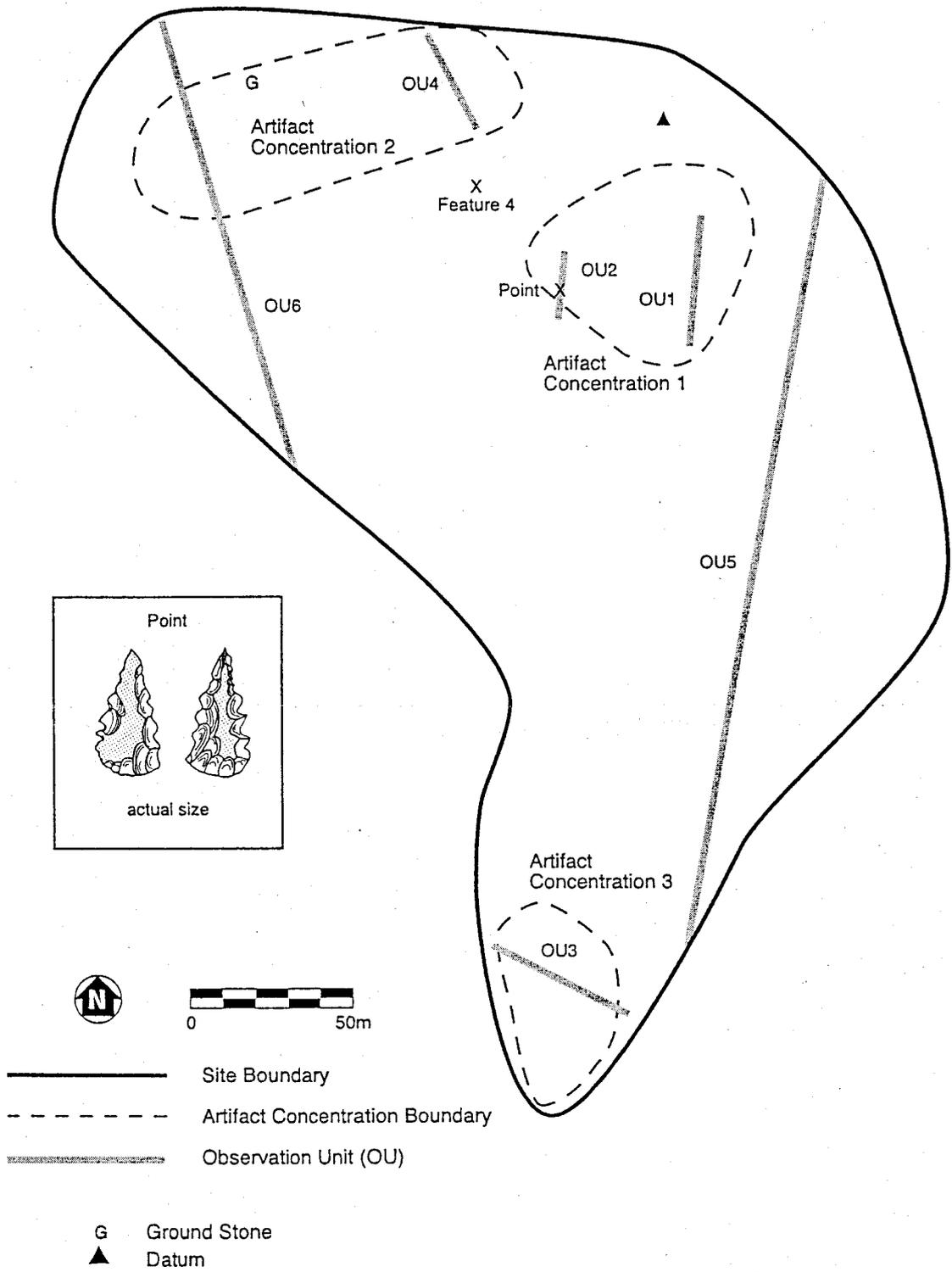
The ceramics within the assemblage indicate a Hohokam presence, although we were unable to define specific types during the survey and so are unable to assign the site to a definite time period. The diversity of artifact types suggests procurement of native plant resources and processing activities were pursued in this location, which is likely considering the proximity of the site to Centennial Wash.

### **National Register Assessment**

The site is in good condition, with just slight evidence—a faded two-track extending through the site—of modern disturbance. Although the site exhibits a low density of surface artifacts, it is possible that additional deposits of cultural materials and cultural features have been buried due to flooding of the wash. Collection and laboratory analysis of the ceramic artifacts have the potential to place this site in a temporal framework, and additional study of the entire assemblage might further define the site's function. Archaeological testing might reveal subsurface deposits and features. Therefore, we recommend site AZ S:7:48 (ASM) be considered eligible for listing on the National Register of Historic Places (National Register).

### **Site AZ S:7:49 (ASM)**

Site AZ S:7:49 (ASM) is a large, low-density scatter of prehistoric artifacts and a possible rock cluster (Figure 7). It is located on privately owned land in Section 1, T12N, R11W (Courthouse



Map of Site AZ S:7:49 (ASM)

Figure 7

Well 7.5-minute USGS quadrangle, 1990 provisional edition). UTM coordinates for the center of the site are N 3713760, E 282380.

### **Environmental Setting**

The site is situated on the Harquahala Plain less than 0.5 mile north of Centennial Wash at an elevation of approximately 1,330 feet above sea level. The site has been slightly affected by cattle grazing, and shows evidence of having been fairly recently covered by flood waters from Centennial Wash.

### **Surface Observations**

Site AZ S:7:49 (ASM) measures approximately 200 by 330 meters (about 16 acres). Artifacts observed include chipped and ground stone, ceramics, and possible FCR. A single feature, a small rock cluster, was identified near the northern edge of the site.

Feature 1 consists of a small cluster of locally available cobbles measuring 0.5 by 1.0 meter (Photograph 2). There are 35 to 40 small vesicular basalt, granite, and rhyolite cobbles, as well as a few pieces of an unidentified rock type. Many of the rocks exhibit angular breaks and several might be fire-cracked. No soil staining was observed either within or around the feature, and no artifacts are in close association. The cluster is somewhat dubious as a cultural feature, but is distinctive in being the only such cluster of rock in the site, or in this area just north of Centennial Wash. Because no soil staining, ash, or charcoal was observed in or near the feature, its function is unknown.



**Photograph 2: Rock Cluster, Feature 1, Site AZ S:7:49 (ASM).**

We defined three surface artifact concentrations on the basis of slightly higher observed densities. Concentration 1, measuring approximately 55 by 65 meters (3,575 square meters), is located in the north-central portion of the site. We placed two observation units (OUs) through this concentration to estimate surface artifact density. OU 1, measuring 1 by 45 meters, contained 68 surface artifacts, representing an artifact density of 1.51 items per square meter. OU 2, measuring 1 by 25 meters, contained 65 surface artifacts, representing an artifact density of 2.6 items per square meter. Based on the average density represented by these two observation units (2.055), we estimate Concentration 1 contains between 7,000 and 7,500 artifacts.

Concentration 2, measuring about 35 by 120 meters (4,200 square meters), is located in the northwestern portion of the site. We placed a single observation unit through the eastern end of the concentration. OU 4, measuring 1 by 35 meters, contained 19 surface artifacts, representing an artifact density of 0.54 item per square meter. Although this OU did not extend lengthwise through the concentration, and therefore might not be entirely representative of the concentration as a whole, its density suggests Concentration 2 might contain as many as 2,300 artifacts.

Concentration 3, measuring approximately 40 by 60 meters (2,400 square meters), is located in the southern tip of the site. We placed one observation unit through this concentration. OU 3, measuring 1 by 45 meters, contained 35 surface artifacts, representing an average density of 0.78 item per square meter. This density suggests Concentration 3 might contain between 1,700 and 2,000 artifacts.

Two observation units were placed across the site outside of apparent concentrations. OU 5, measuring 1 by 245 meters, was placed through the eastern portion of the site. OU 6, measuring 1 by 150 meters, was placed through the western portion of the site. Both OUs contained five surface artifacts, representing average densities of 0.02 and 0.3 item per square meter, respectively. These densities suggest there might only be between 1,000 and 1,200 artifacts on the site surface outside of the concentration. In total, the site might contain between 12,000 and 13,000 artifacts. Despite the observation units, however, this estimate seems to be a bit high in comparison to the apparent numbers of artifacts observed during our recording of the site.

Ceramic artifacts dominate the artifact assemblage, but the types are limited. We observed just a few types, including Gila Plain, Gila and Salt varieties, and a type of red-on-buff ware. The decoration on the red-on-buff sherds is very faint, so we were unable to more precisely type this ware. A small number of buff ware sherds were identified, but these might simply be very small, unpainted red-on-buff sherds.

Chipped stone artifacts include flakes of various colored cherts, purple andesite, grey rhyolite, quartzite, and basalt. We also identified three purple andesite cores and a small, serrated obsidian projectile point. The projectile point is located at the southwestern edge of Concentration 1. The ground stone artifacts are of vesicular basalt, and although most items are fragments of larger tools, such as metates and manos, we identified two small, complete, one-handed manos near the northern edge of the site. One of the manos is quartzite and the other is fine-grained basalt. Possible FCR is scattered across the site, and is predominantly of vesicular basalt and granite.

## **Evidence of Site Age and Function**

The ceramics within the assemblage indicate a Hohokam presence, but they exhibit such a wide temporal range that we were unable to assign the site to a definite time period. The diversity of artifact types suggests procurement of native plant resources and processing activities were pursued in this location, which is likely considering the proximity of the site to Centennial Wash.

## **National Register Assessment**

The site is in good condition despite the presence of numerous two-tracks extending into the site from the dirt road at the north end. It is possible that additional deposits of cultural materials and cultural features have been buried due to flooding of the wash and, even if such is not the case, collection and laboratory analysis of the ceramic artifacts have the potential to place this site in a temporal framework. Additional study of the entire assemblage also might further define the site's function. Archaeological testing, and possibly data recovery of Feature 1, has the potential to yield important information about the site's subsurface potential. Therefore, we recommend site AZ S:7:49 (ASM) be considered eligible for listing on the National Register National Register.

## **ISOLATED OCCURRENCES**

Thirty-one isolated occurrences (IOs) of prehistoric artifacts were found and recorded (Table 5). Ceramics were identified at 13 of the IOs, chipped stone artifacts at 12 IOs, and a combination of chipped stone and ceramics at 3 IOs. A combination of ground stone and chipped stone was observed at just one IO. The single ground stone artifact (part of IO 6) was too small to determine tool type. IO 30 includes chipped and ground stone, ceramics, and FCR. Completed Isolated Occurrences of Cultural Materials recording forms are provided in Appendix B.

The chipped stone artifacts consist almost entirely of flakes and pieces of shatter, but one tested cobble (IO 8) and a core (IO 6) also were noted. No obvious lateral retouch or wear damage was observed on any of the flakes. Chipped stone artifacts are of locally available materials, including fine-grained basalt, siltstone, quartzite, chert, and rhyolite.

Most of the sherds located as isolates are plain wares, but numerous buff ware sherds, including a scatter that appears to be the remains of a single jar (IO 10), also were found and recorded. A small number of very eroded red-on-buff sherds were found, but we were unable to determine the decoration style in most cases. IO 9 includes a single sherd with a burgundy exterior. This color likely is the result of differential firing, but we were unable to determine whether it was a type of plain ware or buff ware.

The 30 isolated occurrences found during the survey are evaluated as having no historic values that warrant preservation. It is recommended they be considered ineligible for the National Register.

**TABLE 5  
SUMMARY OF ISOLATED OCCURRENCES**

<b>IO No.</b>	<b>UTM Coordinates</b>	<b>Area (meters)</b>	<b>Description</b>
1	N3715175, E280930	< 1	1 red chert tertiary flake
2	N3715207, E280959	11 x 18	2 tertiary flakes, 1 broken flake, 1 primary flake, 3 pieces of shatter, and 1 secondary flake, all of red chert
3	N3714367, E283293	10 x 21	7 sand tempered plain ware sherds, 1 dark grey rhyolite secondary flake
4	N3714472, E283298	1 x 10	1 red siltstone multidirectional core, 2 red siltstone secondary flakes, 5 sand tempered plain ware sherds
5	N3714029, E283291	1 x 9	2 thin sand-tempered plainware sherds, 1 thick sand-tempered plainware sherd
6	N3713674, E283288	1 x 3	1 tested yellow quartzite cobble, 1 small ground stone fragment, 1 basalt secondary flake
7	N3712713, E283261	1 x 6	4 plain ware sherds, very fine tempered, but including some large pieces of quartz
8	N3712771, E283256	< 1	5 buff ware sherds
9	N3712929, E283271	5 x 20	28 thick sand-tempered plain ware body sherds, 12 buff ware sherds, 12 thin sand-tempered plain ware sherds, 1 unknown sherd with burgundy exterior
10	N3714560, E283329	8 x 9	20 buff ware sherds from a single jar
11	N3713492, E282322	1 x 3	2 brown chert tertiary flakes
12	N3713484, E282336	< 1	1 brown chert tertiary flake
13	N3713449, E282359	< 1	1 red chert secondary flake
14	N3713429, E282366	< 1	1 purple chert tertiary flake
15	N3713404, E282345	1	2 sand-tempered plain ware sherds
16	N3713359, E282327	< 1	1 sand-tempered plain ware sherd
17	N3713343, E282331	1 x 2.5	1 red chert tertiary flake, 1 sand-tempered plain ware sherd
18	N3713382, E282305	< 1	1 pinkish-brown rhyolite or siltstone tertiary flake
19	N3713409, E282292	< 1	1 pinkish-brown siltstone tertiary flake
20	N3713401, E282257	< 1	1 sand-tempered plain ware sherd
21	N3713376, E282270	< 1	1 sand-tempered plain ware sherd
22	N3713357, E282257	< 1	1 eroded red-on-buff sherd
23	N3713384, E282180	< 1	1 red chert secondary flake
24	N3713493, E282168	1 x 2	1 sand-tempered plain ware sherd, 2 buff ware sherds
25	N3713512, E282155	< 1	1 purplish rhyolite tertiary flake
26	N3713560, E282075	< 1	1 grey rhyolite primary flake
27	N3713735, E281986	< 1	2 sand-tempered plain ware sherds
28	N3713878, E281870	< 1	4 red-on-buff sherds
29	N3715274, E281631	< 1	1 red rhyolite tertiary flake
30	N3713407, E282405	30 x 50	27 plain ware sherds; 1 ground stone fragment; 1 core, 5 flakes and 2 pieces of shatter, all of purple chert; 1 basalt flake; and 1 piece of FCR

## CHAPTER 4 - CONCLUSION AND RECOMMENDATIONS

---

This concluding chapter summarizes the results of the survey, then presents an assessment of potential impacts of the proposed project on cultural resources. The chapter ends with recommendations for further consideration of cultural resources as project planning and construction proceeds.

### SUMMARY

The crew surveyed a total of 987 acres, requiring 25 person-days to complete the field survey. They recorded 30 isolated occurrences of cultural materials and 2 prehistoric archaeological sites. Sites AZ S:7:48 and 49 (ASM) are both large, low-density scatters of prehistoric artifacts associated with Hohokam use of the region. The surface artifact assemblages suggest both sites reflect use of the Harquahala Plain north of the Centennial Wash for procurement of native plant resources, and likely some processing as well. Both sites are in good condition, and have the potential to contain buried cultural features or deposits of cultural materials. We recommend both sites be considered eligible for listing on the National Register for their information potential (criterion D).

The 30 isolated occurrences include single or small clusters of ceramics and chipped stone, with one small piece of ground stone present at one of the IOs. Most of the IOs were found just north of Centennial Wash along the northern portion of the proposed pipeline corridor. These IOs do not have any historic values that warrant preservation; therefore, we recommend they collectively be considered ineligible for National Register listing.

### ASSESSMENT OF POTENTIAL IMPACTS

The analysis of potential impacts addressed the issue of whether construction of the facilities associated with the proposed project would directly or indirectly affect any significant cultural resources. Although this is not a federally funded project, impacts were assessed in accordance with regulations for *Protection of Historic Properties* (36 CFR Part 800), which define an effect as a direct or indirect alteration of the characteristics of a historic property that qualify it for inclusion in the National Register. Effects are considered "adverse" when the alterations diminish the integrity of a property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse effects include the following:

- physically destroying a property
- inappropriately altering a property by not following the Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines
- moving a property from its historic location

- changing the physical features within the property's setting that contribute to its historical significance
- introducing visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features
- transferring, selling, or leasing a property out of federal ownership or control without adequate restrictions to ensure preservation

Ground disturbance directly associated with construction of the proposed project was identified as having the only potential to adversely affect the archaeological sites recorded in the project vicinity. The introduction of visual, atmospheric, or audible elements into the setting of such sites is not expected to affect the scientific information of archaeological sites, but these types of effects possibly could degrade the integrity of any traditional cultural places in the vicinity of the project.

Other impacts may be indirect. Ground disturbance could result from overland travel that might increase as a result of enhancing vehicular access into an area. The simple increase of human presence in previously undeveloped areas also could result in inadvertent damage or intentional vandalism to archaeological sites. However, the project is not expected to increase public accessibility.

In addition to the two sites recorded by the survey specifically conducted for the proposed project, Site AZ S:11:3 (ASM) has been previously recorded at the southern end of the proposed natural gas pipeline lateral (refer to Figure 3).

Site AZ S:11:3 (ASM) originally was identified during a survey of alternative corridors for the proposed Palo Verde-Devers transmission line (Berry 1978). It is described on site forms on file with ASM, MNA, and BLM as being located along the boundary between La Paz and Maricopa counties, approximately 100 meters northeast of the existing EPNG pipeline. One of these forms indicates the site does not possess sufficient value to justify its preservation or development. It is described on the BLM site form (filed under number NA 14,787) as a sherd scatter derived from a single vessel likely broken by a vehicle driving over it. Vehicle tracks were observed over the site. Site AZ S:11:3 (ASM) would only be considered an isolated occurrence of cultural materials by today's guidelines for determining what constitutes an archaeological site. The site is described simply as the remains of a broken Colorado Beige vessel. A single sherd had been collected at the time of discovery, but no other work apparently has been conducted since. The site is described as encompassing just 2 square meters and, as mentioned earlier, we did not relocate it. It is described as being located more than 300 feet east of the proposed gas pipeline alignment, and thus is unlikely to be directly or indirectly affected by the proposed construction.

Site AZ S:7:48 (ASM) is located approximately 90 feet east of the proposed natural gas pipeline alignment, north of Centennial Wash. Site AZ S:7:49 (ASM) is located within the proposed well field. Both are recommended as eligible for National Register listing, and both potentially will be directly impacted by the proposed construction.

## RECOMMENDATIONS

The records search indicated that archaeological and historical resources are not abundant in the vicinity of the proposed La Paz Generating Facility. The field survey located two archaeological sites within the boundaries of the proposed facilities, which matches our pre-field estimate that between one and four sites might be present within the footprint of the project facilities.

The two sites recorded are deemed significant because of their potential to yield important information about aboriginal adaptations within the Harquahala Plain. The current design of the proposed facilities, the well field and the natural gas pipeline lateral, indicate that both sites could be directly impacted by construction of these facilities. If the cultural resources cannot be avoided, impacts could be mitigated by undertaking studies to recover important information prior to construction. Archaeological testing and, if warranted, additional data recovery studies could be designed and implemented to mitigate the impacts on both sites.

If additional facility needs are identified, such as more access roads, supplemental cultural resource surveys may be warranted. Findings from any additional survey would be considered as project planning proceeds.

If any human remains or funerary objects are unexpectedly discovered during project construction, they should be protected and reported immediately to the director of the ASM in accordance with Arizona Revised Statutes § 41-865.

## REFERENCES CITED

---

- Batcho, David G.  
1985 *A Preliminary Report of Archaeological Sites Found Along the All American Pipeline Right-of-Way Between Oracle, Arizona and a Point 145 Miles to the West* (revised). New Mexico State University, Las Cruces.
- Bean, Lowell J. and Sylvia Brakke Vane (editors)  
1978 *Persistence and Power: A Study of Native American Peoples in the Sonoran Desert and the Devers-Palo Verde High Voltage Transmission Line*. Prepared for Southern California Edison Company. Cultural Systems Research, Menlo Park, California.
- Berry, Claudia  
1978 *Archaeological Survey of Alternate Transmission Line Corridors between Palo Verde Nuclear Generating Station and the Colorado River*. Museum of Northern Arizona, Flagstaff.
- Boles, Patrick H.  
1994 *Camp Date Creek, A.T., 1867-1873, Nomination to the National Register of Historic Places*. Arizona State Historic Preservation Office, Phoenix.
- Bostwick, Todd W. (assembler)  
1988 *An Investigation of Archaic Subsistence and Settlement in the Harquahala Valley, Maricopa County, Arizona*. Northland Research, Flagstaff.
- Bourke, John H.  
1891 *On the Border with Crook*. Charles Scribner's Sons, New York.
- Brown, Patricia Eyring  
1976a *Archaeological Investigations within a Floodwater Detention Basin, Reach 5A, Granite Reef Aqueduct, Central Arizona Project, Yuma and Maricopa Counties, Arizona*. Arizona State University, Tempe.  
1976b *An Archaeological Clearance Survey of a Barrow Area Associated with the Granite Reef aqueduct, Central Arizona Project, Maricopa County, Arizona*. Office of Cultural Resource Management, Arizona State University, Tempe.
- Brown, Patricia E. and Connie L. Stone (editors)  
1982 *Granite Reef: A Study in Desert Archaeology*. Anthropological Research Papers No. 28 and Anthropological Field Studies No. 3. Department of Anthropology, Arizona State University, Tempe.
- Carrico, Richard L. and Dennis K. Quillen  
1982 *Cultural Resource Inventory and National Register Assessment of the Southern California Edison Palo Verde to Devers Transmission Line Corridor: Arizona Portion*. WESTEC Services, San Diego.
- Chronic, Halka  
1983 *Roadside Geology of Arizona*. Mountain Press Publishing, Missoula.
- Corbusier, William H.  
1886 Apache-Yuman and Apache-Mojaves. *American Antiquarian and Oriental Journal* 8(5):276-284, (6):325-339.
- Crownover, Scott  
2000 *A Cultural Resources Assessment of 1.5 miles for a proposed road in Harquahala Valley, La Paz County, Arizona*. Archaeological Consulting Services, Project No. 00-79, Phoenix.

- Dean, Jeffrey S.  
1991 Thoughts on Hohokam Chronology. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gumerman, pp. 61-149. Amerind Foundation, Dragoon, Arizona and University of New Mexico Press, Albuquerque.
- Dobyns, Henry F., Paul H. Ezell, Alden W. Jones and Greta Ezell  
1963 Death of a Society: The Halchidoma. *Ethnohistory* 10(2):105-161.
- Doyel, David E., Kimberley A. Ryan and Laura Ramos  
2001 *Archaeological and Historical Evaluation of the Proposed La Paz Generating Facility*. URS Cultural Resource Report 2001-48(AZ). URS Corporation, Phoenix.
- Euler, Robert C.  
1968 *An Archaeological Survey of a Portion of the Proposed Granite Reef Aqueduct, Central Arizona*. Prescott College Archaeological Survey, Prescott.
- Ezell, Paul H.  
1963 *The Maricopas: An Identification from Documentary Sources*. Anthropological Papers No. 6. University of Arizona, Tucson.
- Fontana, Bernard L.  
1958 *A Detailed History of the Pima Indians of Arizona, with Special Emphasis on Their Location and the History of Their Water Supply—Between the Years 1846 and 1883*. On file, Arizona State Museum Library, University of Arizona, Tucson.
- Gifford, E.W.  
1932 The Southeastern Yavapai. *Publications in American Archaeology and Ethnology* 29(3):177-252. University of California, Berkeley.  
1936 Northeastern and Western Yavapai. *Publications in American Archaeology and Ethnology* 34(4):247-354. University of California, Berkeley.
- Granger, Byrd Howell  
1983 *Arizona's Names: X Marks the Place*. Falconer Publishing, Tucson.
- Hackenberg, Robert A. and Bernard L. Fontana  
1974 *Aboriginal Land Use and Occupancy of the Pima-Maricopa Indians*. Garland Press, New York.
- Harwell, Henry O.  
1979 *Maricopa Origins: An Ethnohistorical Approach to a Riverine Yuman Community*. Ph.D. dissertation, Department of Anthropology, Indiana University, Bloomington.
- Harwell, Henry O. and Marsha C.S. Kelly  
1983 Maricopa. In *Handbook of North American Indians, Vol. 10: Southwest*, edited by Alfonso Ortiz, pp. 71-85. Smithsonian Institution, Washington, DC.
- Haury, Emil W.  
1950 *The Stratigraphy and Archaeology of Ventana Cave, Arizona*. University of Arizona Press, Tucson.
- Henss, Ruth  
1983 *Preliminary Investigations of the Archaeological Resources in the Kingman to Mobile Pipeline Corridor, Western Arizona*. Arizona State University, Tempe.

Higgins, Howard C. and Judy Brunson

1985 *A Preliminary Report of Archaeological Sites Found Along the All American Pipeline Right-of-Way Between Ward Road in Maricopa County, Arizona, and a Point 95 Miles to the West* (revised). Report No. 610. New Mexico State University, Las Cruces.

Kelly, Marsha C.

1972 The Society That Did Not Die. *Ethnohistory* 19(3):261-265.

Kemrer, Sandra, Sandra Schultz and William Dodge

1972 *An Archaeological Survey of the Granite Reef Aqueduct*. Arizona State Museum, University of Arizona, Tucson.

Khera, Sigrid (editor)

1977 *The Yavapai of Fort McDowell: An Outline of the History and Culture*. Fort McDowell Mojave-Apache Indian Community, Fort McDowell, Arizona.

Khera, Sigrid and Patricia S. Mariella

1983 Yavapai. In *Handbook of North American Indians, Vol. 10: Southwest*, edited by Alfonso Ortiz, pp. 38-54, Smithsonian Institution, Washington, DC.

Lensink, Stephen

1976 *An Archaeological Survey of the West Coast/Mid-Continent Pipeline Project, El Paso Natural Gas Company*. Archaeological Series No. 105.

Mariella, Patricia S.

1983 *The Political Economy of Federal Resettlement Policies Affecting Native American Communities: The Fort McDowell Yavapai Case*. PhD dissertation, Department of Anthropology, Arizona State University, Tempe.

O'Brian, Patrick M., J. Simon Bruder, David A. Gregory

1987 *Cultural Resource Technical Report for the U.S. Telecom Fiber Optic Cable Project from San Timoteo, CA to Socono, TX (Arizona Segment)*. Dames & Moore, Phoenix, Arizona.

Porter, Joseph C.

1986 *Paper Medicine Man: John Gregory Bourke and his American West*. University of Oklahoma Press, Norman.

Rogge, A.E.

1976 *An Archaeological Survey of Realigned Portions of Reach 5A, Granite Reef Aqueduct, Central Arizona Project, and Addendum 1*. Bureau of Reclamation, Phoenix.

Schell, Loa M. (compiler and editor)

1993 *1993-1994 Tribal Directory of the 21 Federally Recognized Tribes in Arizona*. Arizona Commission on Indian Affairs, Phoenix.

Schroeder, A.H.

1974 *A Study of Yavapai History*. Garland Press, New York.

Sellers, William D. and Richard H. Hill

1974 *Arizona Climate, 1931-1972*. University of Arizona Press, Tucson.

Sires, Earl W.

1989 *Archaeological Investigations at Eight Sites in the Tonopah Desert: The Fourmile Wash Project*. SWCA Environmental Consultants, Flagstaff.

Spier, Leslie

1933 *Yuman Tribes of the Gila River*. University of Chicago Press, Chicago.

Stein, Pat H.

1981a *The Palo Verde Archaeological Investigations, Aboriginal Resources at the Palo Verde Plant Site*. Research Paper 21, Part 1. Museum of Northern Arizona, Flagstaff.

1981b *The Palo Verde Archaeological Investigations, Wintersburg: An Archaeological, Archival and Folk Account of Homesteading in Arizona*. Research Paper 21, Part 2. Museum of Northern Arizona, Flagstaff.

Stone, Bradford W.

1996 *Cultural Resources Survey of a CA 75 Acre Arizona Department of Transportation-Owned Disposal Parcel located North of Interstate-10 and East of the Avenue 75E Traffic Interchange, Approximately 70 Miles West of Phoenix, Maricopa and La Paz Counties, Arizona*. Archaeological Research Services.

Stone, Connie L.

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

1987 *People of the Desert, Canyons, and Pines: Prehistory of the Patayan Country in West Central Arizona*. Cultural Resource Series Monograph No. 5. Bureau of Land Management, Phoenix.

Swartz, Deborah and Kurt Dongoske

1987 *Cultural Resource Assessment of Construction Locations and Towers along the Devers-Palo Verde No. 2 Transmission Line, Western Arizona*. Technical Report No. 87-7. Institute for American Research, Tucson.

Trott, J. James

1974 *Final Report for Phase II Investigations at the Palo Verde Hills Plant Site Location (A-75-141)*. Museum of Northern Arizona, Flagstaff.

Turner, R.M. and D.E. Brown

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

Wasley, William W. and Alfred E. Johnson

1965 *Salvage Archaeology in Painted Rock Reservoir, Western Arizona*. Anthropological Papers No. 9, University of Arizona Press, Tucson.

Waters, Michael

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