

**VOLUME II  
Remedial Investigation Report  
South Mesa WQARF Registry Site  
Mesa, Arizona  
ADEQ Task Assignment EV11-0084**

**Prepared for:**

**Arizona Department of Environmental Quality  
Waste Programs Division  
1110 West Washington Street  
Phoenix, Arizona 85007**

**Prepared by:**

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**March 15, 2013**

**AMEC Project No. 14-2012-2022.04.01**

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## **APPENDIX A**

### **LAND AND WATER USE STUDY REPORT**

**LAND AND WATER USE STUDY REPORT  
SOUTH MESA WQARF REGISTRY SITE  
MESA, ARIZONA  
ADEQ TASK ASSIGNMENT 04-0101**

**Prepared for:**

**Arizona Department of Environmental Quality  
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**MACTEC Project No. 4972-06-2050.7.2**

**June 5, 2007**

June 5, 2007

Ms. Cathy O'Connell  
Project Manager  
Superfund Projects Section  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, Arizona 85007

Subject: **Land and Water Use Study Report  
South Mesa WQARF Registry Site  
ADEQ Task Assignment 04-0101  
MACTEC Project No. 4972-06-2050.7.2**

Dear Ms. O'Connell:

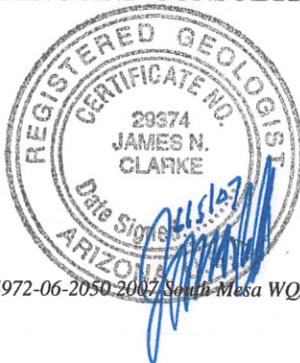
MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to submit this *Land and Water Use Study Report* for the South Mesa WQARF Registry Site (SMWRS). The Land and Water Use Study presents a summary of current and potential future uses of land and water at the South Mesa WQARF Registry Site as required by the WQARF Remedy Selection Rules, Arizona Administrative Code (A.A.C) R18-16-406 (D).

If you have any questions or comments regarding this work plan, please contact Mr. James Clarke at (602) 437-0250.

Sincerely,

**MACTEC ENGINEERING AND CONSULTING, INC.**

  
James N. Clarke, R.G.  
Principal Geologist



  
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## EXECUTIVE SUMMARY

As required by the WQARF Remedy Selection Rules, A.A.C R18-16-406 (D), this Land and Water Use Study Report (Use Study) has been prepared in conjunction with the Remedial Investigation of the South Mesa WQARF Registry Site (SMWRS). The Use Study presents a summary of current and potential future uses of land and water at the SMWRS.

The Use Study is intended to be an inclusive summary of information gathered from discussions with property owners, water providers, municipalities, and well owners. In general the study does not discriminate between “reasonably foreseeable” uses and other uses that were identified.

The identification of land and water use included the review of planning documents, reports, and consultation with water providers, property owners, and stakeholders. Department of Water Resources data were reviewed to determine the location and use of any nearby production wells and to identify persons holding water rights in the area. A survey of property owners with wells and persons holding water rights in the area was also conducted to obtain information about current and future use of groundwater in the area. The following summarizes the results of the Land and Water Use Study.

### **Land Use**

According to Mr. Mark Gunning, current owner of the 1545 North McQueen Road property, the future land use for the former Applied Metallica Site is expected to remain general commercial (C-2). As shown on Figure 4, the former Applied Metallica Site is located in an area that is zoned by the Town of Gilbert as commercial and industrial. Based on future land use plans provided by the Town of Gilbert, there are no immediate plans to change the land use or zoning for this area.

The boundary between the Town of Gilbert and City of Mesa is Baseline Road. Therefore, the boundary of the Regional Groundwater Impact Area, which is also referred to as the PCE groundwater plume, extends into the City of Mesa. The portion of the Regional Groundwater Impact Area located in the area bounded by Mesa Drive on the west, US60 on the north, Stapley Drive on the east, and Baseline Road on the south, is zoned commercial by the City of Mesa. However, the portion of Regional Groundwater Impact Area located in the area bounded by Mesa Drive on the west, Broadway Road on the north, Stapley Drive on the east, and US60 on the south, is predominantly zoned residential by the City of Mesa. Based on future land use plans provided by the City of Mesa, there are no immediate plans to change the land use or zoning for the areas of the City of Mesa overlying the Regional Groundwater Impact Area.

### **Groundwater Use**

#### **Town of Gilbert**

Gilbert does not currently own production wells in the study area and has no plans to install additional wells within the Study Area boundaries. According to SRP, SRP Well 29E-1N, located at Stapley Drive and Southern Avenue and within the boundaries of the Study Area, is connected to the Gilbert water supply system. This well has not been extensively pumped, with a total of 42.79 acre-feet (af) of water pumped from January 1991 through May 2002 (SRP, 2002a).

### **City of Mesa**

Mesa currently operates one production well, identified as Mesa No. 14, within the boundaries of the Study Area, and two production wells, identified as Mesa No. 10 and Mesa No. 13, slightly outside the Study Area boundaries. In regards to pumping of the existing wells, Mesa currently only pumps these wells during dry-up of SRP canals, in times of peak demand, or during surface water shortage. Mesa plans to continue this operation schedule. Mesa indicated that they have no plans for installation of new wells within the boundaries of the Study Area.

### **Salt River Project**

SRP currently owns six wells within the Study Area boundaries. These wells are not pumped on a regular basis and according to SRP there are no anticipated changes in the pumping schedule.

### **Private Groundwater Use**

The groundwater use survey has indicated the Cooley Well (55-636810), located at 765 E. Baseline Road, Gilbert, is the only identified current potential groundwater use by a private property owner within the Study area. ADEQ is attempting to contact Robert or Steve Fuller, current owners of this property, to verify the existence and use of the well.

Private property owners within the Study Area may install an exempt, less than 35 gallons per minute, domestic well on their property for personal use provided that the well is registered with the ADWR. This potential use should be considered. However, considering the fact that the private properties within the Study Area are connected to municipal water supplies and the cost for installing a production well, this use in the future is unlikely.

### **Surface Water Use**

The Kokopelli Golf Club ponds are the only identified surface water bodies located within the Study Area boundary. However, the Kokopelli Golf Club ponds do not receive groundwater pumped within the Study Area boundaries. Therefore, the Kokopelli Golf Club ponds are not considered a surface water use within the Study Area. The Western Canal, which receives discharge from the SRP wells located in the South Mesa WQARF Registry Site, is the only surface water use identified. As previously indicated, the Kokopelli Golf Club ponds do receive water from the Western Canal. However, considering the water originating from SRP wells located in the Study Area discharges to the Western Canal at a point downstream of the Kokopelli Golf Club ponds, the ponds should not be impacted by future pumping of the SRP wells.

## 1.0 INTRODUCTION

This Land and Water Use Study (Use Study) for the South Mesa WQARF Registry Site (SMWRS) has been prepared by the Arizona Department of Environmental Quality (ADEQ) with the assistance of MACTEC Engineering and Consulting, Inc. in accordance with the scope of work and terms and conditions of the following: Arizona Superfund Response Action Contract (ASRAC) No. 99-0017 between MACTEC and ADEQ dated August 31, 1998; the ADEQ Task Assignment No. 00-0094, dated December 20, 1999 and amended January 13, 2000; and, ADEQ Task Assignment No. 04-0101, dated March 24, 2004. The study presents a summary of current and future land and water use at the site as required by R18-16-406 (D)(3).

The land and water use study area is typically the Community Involvement Area (CIA) for a WQARF Registry Site. However, based on the identified boundaries of the contaminant plume associated with the SMWRS, the boundaries of the Land and Water Use Study Area (Study Area) are defined as follows (see Figure 1):

- Broadway Road on the North;
- Stapley Road (Mesa)/Cooper Road (Gilbert) on the East;
- Guadalupe Road on the South;
- Union Pacific Railroad tracks/Center Street on the West.

The SMWRS is divided into two areas of concern, the Applied Metallica Source Area and the Regional Groundwater Impact Area. Figure 2 is a site plan of the former Applied Metallica facility and Figure 3 shows the Regional Groundwater Impact Area. The Land Use Study is predominantly focused on the Applied Metallica Source Area, which is located at 1545 North McQueen Road in Gilbert, Arizona. However, land use plans for the portions of the study area within the City of Mesa (Mesa) and Town of Gilbert (Gilbert) were reviewed and are summarized. Current land uses for the study area involved a review of zoning and planning documents for Gilbert and Mesa. Shallow, soil impacts do not apparently extend to properties surrounding the Applied Metallica Source Area. Therefore, other property owners within the study area were not contacted or interviewed regarding future land uses.

The Water Use Study is focused on the entire study area and is intended to be an inclusive summary of information gathered from discussions with study area water providers, municipalities, well owners, and persons holding water rights. The water providers within the Study Area are Mesa, Gilbert, and the Salt River Project (SRP). The Water Use Study involved a review of the following information that was obtained from the Arizona Department of Water Resources (ADWR):

- A list of persons holding groundwater withdrawal rights within the Study Area.
- A list of registered production wells within the Study Area.

After the water providers, well owners and persons holding water rights were identified, a survey was conducted to obtain information regarding current and future uses of groundwater within the Study Area.

The SMWRS is located in the Phoenix Active Management Area (PAMA), an area where groundwater use is controlled and regulated. In order for a private party to pump and use groundwater, the party must have the right to pump and use the groundwater. There are two rights that parties can use to pump groundwater within the PAMA, an exempt right or a non-exempt right. All property owners have the right to pump up to 35 gallons per minute (gpm) of groundwater for use at that property. This right is referred to as an exempt right and carries the conditions that the on-site well must be registered with the Arizona Department of Water Resources (ADWR), the well must meet applicable well installation criteria, and the water must be used at the property on which the well is located. Pumping of more than 35 gpm requires a non-exempt right. Three non-exempt rights available to private parties exist as follows: Grandfathered Irrigation Rights, which are attached to the property; Type 1 rights, which are typically converted Grandfathered Irrigation Rights and are attached to the property; and, Type 2 rights, which are floating rights and are attached to wells.

## **1.1 PROCESS OVERVIEW**

The process to complete the remedial investigation (RI) and select the remedial objectives (ROs) begins with the completion of the *Remedial Investigation Report*. Following the completion of the *Remedial Investigation Report*, which includes the Use Study, a public meeting is held to discuss

the Use Study and solicit input for the selection of ROs. Typically the public will be given 30-days to comment on the Use Study. Following the public comment period and meeting, ADEQ issues the *Proposed Remedial Objectives Report*. If significant public interest is indicated or additional information is obtained, an additional public meeting is to discuss the ROs. The *Proposed Remedial Objectives Report* is then finalized and attached to the *Final Remedial Investigation Report*.

## 1.2 THE USE STUDY

The Use Study presents a summary of current and potential future uses of land and water at the SMWRS as required by R18-16-406 (D)(3). The Use Study is intended to be an inclusive summary of information gathered from discussions with property owners, water providers, municipalities, and well owners. In general, the study does not evaluate the uses. The evaluation of uses will take place during public meetings and in the *Proposed Remedial Objectives Report*.

While this Use Study does identify various uses of land and water in the vicinity of the SMWRS, the decision to classify a use as “reasonably foreseeable” will not be made in this Use Study. That decision will be made during the RO selection process and will be made with stakeholder input through public comment periods, Community Advisory Board (CAB) meetings, and public meetings. There may be uses discussed in the Use Study that have little or no bearing on the ROs selected for the SMWRS. Additionally, the accuracy of information obtained from property owners, water providers, and reports and planning documents cannot be guaranteed. The Use Study included the collection of the following information:

- Information regarding current and reasonably foreseeable uses of water for each aquifer that is impacted or is threatened to be impacted by the release. This information must be collected in consultation with water provider and must include:
  - The locations and uses of existing wells (including wells already impacted);
  - The locations and uses of any planned wells (if known); and
  - Written water management plans used by water providers whose water supplies may be impacted by the release.
- Information regarding current and reasonably foreseeable uses of water for each segment of surface water impacted or is threatened to be impacted by the release (collected in consultation with water providers).

- Information regarding current and reasonably foreseeable uses of land impacted or is threatened to be impacted by the release. This information, collected in consultation with local governments with land use jurisdiction, includes:
  - Current landscape including type of use, density, character, property ownership, and governmental jurisdiction; and
  - Future land use changes using population projections, growth, plans for future development, and local land use plans.

### **1.3 REMEDIAL OBJECTIVES**

The ROs will be based on the current and reasonably foreseeable uses of land and water at the SMWRS and will be stated in terms of: protecting against the loss or impairment of an existing use; restoring, replacing or otherwise providing for each listed use; time frames when action is needed to protect or provide for the use; and, the projected duration of the action needed. The RO will generally be expressed as a statement of intent to address the reasonably foreseeable use.

The *Proposed Remedial Objectives Report* will include analysis, evaluation, and interpretation of data obtained from the Use Study, will reflect public input obtained from the comment period and public meetings, and will put forward which uses are considered “reasonably foreseeable.” If a use is considered reasonably foreseeable, the use will be included in the *Proposed Remedial Objectives Report* along with a discussion of why the use is reasonably foreseeable. The *Proposed Remedial Objectives Report* will not include a discussion of potential remedies or an evaluation of how the ROs may be achieved, both of which will be included in the Feasibility Study (FS).

### **1.4 FEASIBILITY STUDY**

After the *Final Remedial Investigation Report* is released, inclusive of the *Final Remedial Objective Report*, the FS will begin. The FS will include the evaluation of a Reference Remedy, and at least two Alternative Remedies. Each of the Remedies will be capable of achieving the ROs and shall consist of a remedial strategy and the remedial measures to be employed by each strategy. A remedial strategy can be plume remediation, physical containment, controlled migration, source control, monitoring, or no action. A comparative evaluation of the remedies including practicality, risk, costs, and benefit, as well as consistency with water provider plans will be included in the FS.

## 2.0 USE IDENTIFICATION

### 2.1 LAND USES

#### 2.1.1 Current Land Use

##### 2.1.1.1 Former Applied Metallica Site

Mr. Mark Gunning, current owner of the 1545 North McQueen Road property was interviewed regarding current and future land uses for the referenced property. Mr. Gunning stated that the property is currently being used for commercial use and that the current zoning for the property is C-2, general commercial by the Town of Gilbert.

The building currently consists of five suites, identified as suites 1 through 5 and currently suites 1 and 4 are occupied by commercial tenants.

##### 2.1.1.2 Town of Gilbert

Current land use for the Gilbert segment of Study Area (Gilbert segment) consists of single residences, multiple residences, neighborhood/general commercial, industrial, and public facilities (Figure 4). Baseline Road separates Gilbert from Mesa and demarcates the Gilbert segment from the Mesa segment. The Gilbert segment is bounded as follows: to the north by Baseline Road; to the east by Cooper Road; to the south by Guadalupe Road; and, to the west by the tracks of the Union Pacific Railroad (former Southern Pacific Railroad). The Gilbert segment occupies approximately 950 acres of land.

Based on the review of the zoning map obtained from the Town of Gilbert Planning and Zoning Department (Figure 4), current zoning for the Gilbert segment includes AG (agriculture), R1-43 (rural residential – one acre per dwelling unit), R1-10 (10,000 sq. ft. per dwelling unit), R1-7 (7,000 sq. ft. per dwelling unit), R-2 (two family duplex residential), C-1 (light commercial), C-2 (general commercial) I-1 (garden industry), I-2 (light industry), I-3 (general industry), and PF/OS (public facility/open space). An elementary school and future fire station are also shown on the zoning map. Current zoning in the vicinity of the Gilbert segment includes all those above plus R1-5 (5,000 sq. ft. per dwelling unit), R-3 (multi-family – 18 dwelling units per acre), and PCS-1 (planned neighborhood shopping center). Current zoning to the north (Baseline Road) is reflected

in those zoned areas for the Mesa segment of the Study Area. An aerial photograph taken of the Gilbert segment in 2001 (Figure 5) also shows the industrial, commercial, and residential use areas.

### **2.1.1.3 City of Mesa**

Current land use for the Mesa segment of the Study Area (Mesa segment) consists of single residences, multiple residences, neighborhood/general commercial, industrial, and public facilities (Figure 6). The Superstition Freeway cuts in half the Mesa segment from east to west and accounts for approximately 1/12 of the Mesa segment. The Mesa segment is bounded as follows: to the north by Broadway Road; to the east by Stapley Drive; to the south by Baseline Road; and, to the west by Center Drive. The Mesa segment occupies approximately 1,650 acres of land.

Based on the review of the zoning map obtained from the City of Mesa Planning Department (Figure 6), current zoning for the Mesa segment includes AG (agriculture), R1-6 (single residence), R-2 (restricted multiple residence), R-3 (limited multiple residence), R-4 (General multiple residence), O-S (office-Service), C-1 (neighborhood commercial), C-2 (limited commercial), C-3 (general commercial), M-1 (limited industrial), and PF (public facilities). Schools, parks, bonus intensity zone (B.I.Z.), and planned area development (P.A.D.) are shown on the map as un-coded. Current zoning in the vicinity of the Mesa segment includes all those above plus M-2 (general industrial). Current zoning to the south (Baseline Road) is reflected in those zoned areas for the Gilbert segment of the Study Area. An aerial photograph taken of the Mesa Segment in 2001 (Figure 5), also shows the industrial, commercial, and residential use areas.

## **2.1.2 Future Land Use**

### **2.1.2.1 Former Applied Metallica Site**

Mr. Gunning stated that he had no plans to change the current commercial use of the property and that it was unlikely that the zoning for this property (C2-general commercial) would change anytime in the near future.

### **2.1.2.2 Town of Gilbert**

Based on Census data from the period between 1990 and 2000, Gilbert became the fastest growing community over 100,000 residents in the United States. The town grew during this period from approximately 29,000 people to approximately 110,000. Gilbert is also unique in the number of County subdivisions and wildcat subdivisions located within its planning boundary. A majority of

these areas are served by Gilbert water as the town acquired the private water company serving the area.

The requirements of state legislation called “Growing Smarter” (ARS 9-461.05.D.2) directed the town to encourage new growth into targeted areas. Specific areas of planned growth that will support a variety of uses include the Heritage District, Santan Freeway Corridor, Gateway Area, Morrison Ranch, Power Ranch, Layton Lakes, Seville, Freeman Farms, and Shamrock Estates. Planned development in these areas will have little to no impact on the Gilbert segment of the Study Area. The Town of Gilbert has also developed land use guidelines for residential land, commercial land, employment uses, municipal/institutional land, and environmentally sensitive lands.

Rezoning issues that could have future impacts on the Gilbert segment are evaluated to assure conformance with the Gilbert General Plan by the following: the Gilbert Planning and Zoning Commission; planning and zoning staff; and, Town Council. An important element to the plan states; “Lands must be assessed for sensitive physical or cultural sites prior to application for rezoning or preliminary subdivision map approval. Requests for development entitlements must be accompanied by a list of mitigation measures for any sensitive condition found”.

### **2.1.2.3 City of Mesa**

According to the Mesa General Plan (updated 2000) the population of Mesa has increased by only 5,000 people during the years 1995-2000. However, the area within the city limits has expanded from 122 square miles in 1995 to over 172 square miles in 2000. The potential for expanding Mesa’s land area has now been fixed by adopted planning implemented by the City.

Mesa’s future land use will principally focus on infill development, the rapid residential build-out of remaining developable land. Such infill will include the Citrus Area (cultivated citrus orchards), Lehi Area, Williams Gateway Airport/GM Proving Grounds, Citrus Sub-Area, East Lehi Sub-Area, Desert Uplands Sub-Area, Williams Gateway Airport/Proving Grounds Sub-Area, and Falcon Field Airport Sub-Area. Planned development in these areas will have no impact on the Mesa segment. Mesa’s development standards are generally less stringent than many of the Southeast Valley’s communities. Currently there are no guidelines available to use in establishing new developments or for redevelopment areas.

Mesa's Zoning Ordinance lists in detail how every privately held parcel of property may be developed, while its zoning map identifies how each piece of property is zoned. Often property is proposed for rezoning (changing the zoning classification), and this could have an impact on the Mesa segment, before it can be developed, thereby giving the opportunity to review the project for compliance with the Mesa General Plan.

## **2.2 GROUNDWATER USES**

This section is subdivided into discussions of potential groundwater use by water providers and private groundwater use. Groundwater use is also influenced by hydrogeological and groundwater quality considerations and available water supplies. Therefore, this section also includes a discussion of hydrogeological and groundwater quality considerations. Information on municipal use was taken from reports, correspondence, and interviews/conversations with area water providers. A complete list of documents reviewed is included in Section 4. Private groundwater use was evaluated by reviewing Arizona Department of Water Resources (ADWR) well registration information provided in their Water Resources Well Reports.

Based on review of the ADWR Well Registry Report, there are 15 registered production and private use wells (exempt and nonexempt) within the Study Area. A list of the wells is provided in Table 1 and the well locations are shown on Figures 1, 3, and 7. Of the 15 wells within the Study Area, 11 are within the boundary of the SMWRS and five of the 11 are within the boundary of the Regional Groundwater Impact Area. Of the wells that are located outside the boundary of the Regional Groundwater Impact Area, six of the wells are presumed threatened by the SMWRS. In accordance with A.A.C. R18-16-405 (I), a well that is located one-quarter mile upgradient, one-half mile cross-gradient and one-mile downgradient is presumed threatened. The remaining five wells within the Study Area are more than one-half mile from the boundary of the SMWRS and/or Regional Groundwater Impact Area. Therefore, these wells are not presumed to be threatened.

MACTEC also reviewed the ADWR database listing persons holding water rights in the area. Based on the information provided by the ADWR, there are 47 entities that have Irrigation Grandfathered Rights or Type I Non-Irrigation Rights that are located within the Study Area. These rights are termed "Type I" and are fixed to a particular property and cannot be transferred. Table 2 provides a list of persons holding Type I rights within the Study Area.

MACTEC also reviewed a list of persons holding “Type II” water rights within the PAMA. A “Type II” Grandfathered water right is a floating right and is not fixed to a particular property (not attached to any point of withdrawal). Therefore, a person holding a “Type II” right can withdraw water anywhere within the PAMA as long as the well is registered with ADWR. According to the ADWR there are 29 entities that have “Type II” water rights within the PAMA. A list of persons holding Type II rights is provided in Table 3.

## **2.2.1 Hydrogeological, Groundwater Quality, and Available/Assured Water Supply Considerations**

Important factors influencing the current and future use of groundwater are the depth from which the groundwater is obtained, the quality of that water, the availability of other supplies of water, and assured water supply requirements. Water quality typically degrades naturally with depth, often containing naturally increasing concentrations of dissolved metals, salts and minerals, which are referred to as total dissolved solids (TDS). According to ADWR Assured Water Supply (AWS) restrictions, due to naturally degrading water quality, pumping of groundwater deeper than 1,000 feet below ground surface (bgs) is prohibited. The costs to pump groundwater also increase with depth. This is due to increased well installation costs with depth, and increasing electrical costs to pump the water with depth. Therefore, the depth from which the groundwater is pumped is a limiting factor for groundwater use.

### **2.2.1.1 Hydrogeological Considerations**

Within the boundaries of the Study Area, groundwater levels rose approximately 70 feet from the early 1980’s to 2000. However, groundwater levels declined more than 15 feet between 2000 and 2004, at which time the lowest groundwater elevations since 1990 were measured. Groundwater elevations have been rising within the Study Area since 2004 and as of December 2006 groundwater elevations are at all-time highs. Depth to groundwater within the Study Area currently ranges from approximately 104 feet bgs to approximately 116 feet bgs, with water levels typically higher in the northern portions of the Study Area. Through December 2004, groundwater within the Study Area had historically flowed in a northeasterly direction. However, since December 2004, groundwater generally flows in a southerly direction. Depth to water and groundwater flow direction are dependent on the rates of local and regional groundwater pumping and recharge and the changes in groundwater elevations and flow direction are attributed to changes in these conditions.

There are no wells located within the Study Area that are greater than 1,100 feet deep. However, it is generally accepted that the alluvial sediments below the Study Area are saturated to a depth of more than 2,500 feet bgs. Within the Study Area, the upper 1,000 feet of the alluvial sediments are divided into two units; the Upper Alluvial Unit (UAU) from the surface to a depth of approximately 250 feet bgs, and the Middle Alluvial Unit (MAU) from approximately 250 feet bgs to 1,000 feet bgs. The UAU is considerably coarser-grained than the MAU. Therefore, the UAU is characterized by relatively high hydraulic conductivities ranging from 1,300 gallons per day per square foot (gpd/ft<sup>2</sup>) to 3,600 gpd/ft<sup>2</sup>. Wells pumping from the UAU can yield as much as 2,000 gallons per minute (gpm) of water. In contrast, the MAU has an estimated hydraulic conductivity of 800 gpd/ft<sup>2</sup> and water yields of less than 800 gpm.

Based on information obtained from monitoring wells drilled at the SMWRS, there are four distinct hydrologic zones present in the UAU as follows: UAU1 from 120 feet bgs to 140 feet bgs; UAU2 from 155 feet bgs to 175 feet bgs; UAU3 from 195 feet bgs to 205 feet bgs; and, UAU4 from 220 feet bgs to 250 feet bgs (contact with the Middle Alluvial Unit [MAU]). Each zone is separated by water bearing aquitards present from approximately 140 feet bgs to 155 feet bgs, from approximately 175 feet bgs to 195 feet bgs, and from approximately 205 feet bgs to 220 feet bgs. Water yield apparently increases with depth with Zone UAU4 apparently having the highest water yield.

There are two types of production wells that can be drilled and installed, an exempt well, which is defined as having a pump capacity of less than 35 gallons per minute (gpm), and a non-exempt well, which has a pump capacity of greater than 35 gpm. All property owners in the PAMA have the right to pump up to 35 gpm of water from an aquifer for use at that property. However, pumpage in excess of 35 gpm requires the party be a water provider or hold a Type I or Type II right.

As previously indicated, the costs to drill and install a production well increase with depth. Without taking into consideration existing water quality issues, an exempt well in the UAU should be drilled and installed to a depth of at least 150 feet bgs. The cost to drill and install the well and install pump equipment may be as high as \$15,000. The MAU is known to contain higher quality water than the UAU. Therefore, the cost to drill and install an exempt well into the MAU and install pump equipment may be as high as \$100,000. The costs for non-exempt wells increase with

depth and pump capacity. The cost for a non-exempt well in the UAU may be as high as \$50,000, while the cost for a non-exempt well in the MAU may be as high as \$500,000. These costs do not include pump electrical and maintenance costs. Therefore, the hydrogeologic considerations influence costs, which in turn influence groundwater uses.

### **2.2.1.2 Groundwater Quality Considerations**

As indicated above, there are two aquifer units within the Study Area from which groundwater can be pumped. The following discusses groundwater quality considerations for each aquifer unit.

#### **2.2.1.2.1 Upper Alluvial Unit**

The UAU predominantly receives recharge from the surface. Therefore, the UAU is susceptible to chemical impacts from the surface. The RI of the SMWRS has demonstrated that groundwater in the UAU contains tetrachloroethene (PCE) above the Aquifer Water Quality Standard (AWQS) of 5.0 micrograms per liter ( $\mu\text{g/L}$ ). However, there were pre-existing groundwater quality issues that influences use of groundwater pumped from the UAU.

Prior to development of the area, groundwater within the UAU was considered to be of high quality and a readily available supply of water. However, input of agricultural chemicals, predominantly nitrates, has degraded the groundwater quality of the UAU. From July 2000 through March 2001, groundwater samples collected from the SMWRS wells were analyzed for nitrate and sulfate. The AWQS for nitrate (as nitrogen [N]) is 10 milligrams per liter (mg/L). Nitrate concentrations in the groundwater samples ranged from 5 to 25 mg/L, with the concentrations typically above the AWQS of 10 mg/L. Sulfate ranged in concentration from 140 mg/L to 680 mg/L. Sulfate does not have an AWQS. However, the EPA Secondary Maximum Contaminant Level (SMCL) is 250 mg/L. Therefore, the groundwater in the UAU contains sulfate concentrations near or above the SMCL of 250 mg/L. The groundwater also contains high concentrations of chloride and contains TDS in excess of the SMCL of 500 mg/L. Therefore, even without the PCE impact, groundwater from the UAU should not be used as a drinking water supply without extensive treatment. This is likely the reason why the water providers in the area do not utilize the UAU as a drinking water supply, even though the aquifer yields high quantities of water, well installation costs are lower, and pumping costs are lower. However, the water is apparently suitable for irrigation uses.

#### 2.2.1.2.2 Middle Alluvial Unit

The groundwater within the MAU is considered to be of higher quality than the groundwater within the UAU. However, there are still nitrate and TDS issues associated with the MAU, particularly the shallower portions of the MAU. Mesa currently utilizes the MAU as a drinking water supply aquifer and has four production wells located in the vicinity of the Study Area. Mesa Wells 10, 13, and 15, screened entirely within the MAU, are located along Broadway Road within a mile of the Study Area boundaries (see Figure 1). Mesa Well No. 14, also screened entirely in the MAU, is located in the northern portion of the Study Area. According to available data, water pumped from these wells is considered to be of good to moderate quality, containing low concentration of nitrates, less than 2.0 mg/L, low concentrations of sulfate, less than 100 mg/L, and less than 800 mg/L of TDS.

The six SRP wells located in the Study Area are screened across the UAU/MAU contact. Therefore, these wells pump a portion of their water from the MAU. However, considering the differences in hydraulic conductivity between the UAU and MAU, the SRP wells likely pump most of their water from the UAU.

#### 2.2.1.3 Available Water Supply Considerations

The availability of other water supplies should be taken into consideration when evaluating current and future uses of groundwater. The SMWRS is located within the boundaries of both Mesa and Gilbert and it appears that municipal water supplies are available to the properties located within the municipal boundaries. Salt River Project (SRP) is also an irrigation water provider in the area and irrigation water is available from SRP. Therefore, when considering groundwater use, the costs for and quality of water supplied by providers must be weighed against costs for installation and operation of wells and the quality of water pumped from the wells.

There are three water providers in the area as described in Section 2.2.2; Mesa, Gilbert, and SRP. As described in Section 2.2.2, the water providers also have access to alternate supplies of water, including surface water supplies, treated effluent, and groundwater pumped from other areas, including water farms. Therefore, access to other water supplies and costs for those supplies may reduce the need to pump groundwater from a given area. However, the presence of existing wells and need to meet Assured Water Supply (AWS) requirements will influence groundwater usage in a given area.

#### **2.2.1.4 ADWR Assured Water Supply and Groundwater Management Act**

The ADWR Assured Water Supply (AWS) and Groundwater Management Act (GMA) requirements are important considerations in evaluating groundwater uses. The SMWRS is located within the Phoenix Active Management Area (PAMA), which is defined as those areas utilized for new developments (residential, commercial, and industrial). Municipalities and new developers must show that their developments have a 100-year water supply, referred to as an AWS.

Mesa was issued a Designation of AWS by ADWR in September 1997. With the AWS Designation, Mesa demonstrated the physical, legal, and continuous availability of groundwater, surface water, Central Arizona Project (CAP) water and effluent water in an aggregate volume of 121,944 acre-feet per year (AFY), through 2010 for a minimum of 100-years. In terms of groundwater, Mesa demonstrated that projected use was consistent with the goals of the General Plan that included water conservation, water re-use, Pinal County water farm, and groundwater recharge, which will limit groundwater pumping.

Gilbert was issued an AWS Designation by ADWR in December 1997. With the AWS Designation, Gilbert demonstrated the physical, legal, and continuous availability of groundwater, surface water, Central Arizona Project (CAP) water and effluent water in an aggregate volume of 44,065 AFY, through 2010 for a minimum of 100-years.

The SRP does not have an AWS Designation by ADWR. Instead, SRP is designated as a General Provider because its water use is mainly for irrigation, not residential, and SRP uses mostly surface water. However, SRP does have certain reporting requirements (i.e., water exchanges) to ADWR.

In order to maintain the AWS Designation, Mesa and Gilbert must also provide an annual report to the ADWR. AWS restrictions also prohibit pumping groundwater that is deeper than 1000-feet below the ground surface and require water produced from groundwater wells to meet appropriate state water quality standards (i.e., Arizona Aquifer Water Quality Standards), which would require wellhead treatment of groundwater for any new production wells being installed in the same location and aquifer as WQARF groundwater impacted areas.

Arizona's Groundwater Management Act (GMA) requires that cities and towns within Active Management Areas (AMA) transition from the use of mined groundwater to the use of renewable

supplies by the year 2025. As part of the GMA, cities and towns in an AMA that wish to grow must demonstrate a 100-year assured water supply.

## **2.2.2 Water Providers**

Mesa, Gilbert, and the Salt River Project (SRP) are the water providers within the Study Area and have the right to pump groundwater. Currently, Mesa (City Well No. 14) and SRP (two of six wells) are pumping or have the potential to pump groundwater within the Study Area. MACTEC has consulted with these entities in the process of writing this *Land and Water Use Study Report* and has obtained some general information regarding their future need for groundwater in the Study Area. Information obtained from written reports and other communications is summarized in the following subsections.

### **2.2.2.1 Town of Gilbert**

The Gilbert 2000-2001 Integrated Water Resources Master Plan (Water Resources Plan section) is a detailed planning document produced by Carollo Engineers for Gilbert that provides water supply availability information, water resources supply versus demand strategy, water resource management/recharge/banking strategy, and role of conservation to provide adequate water supplies for the future. Some key components of the plan include the following:

- Gilbert currently obtains its water supply from the following sources:
  - SRP (surface water - 30,070 AFY);
  - Roosevelt Water Conservation District (RWCD) (surface water – 12,440 AFY);
  - Colorado River supplies (CAP, Salt River Pima Maricopa Indian Community [SRPMIC] lease water, SRPMIC exchange water, and SRPMIC [firming]) at 11,770 AFY;
  - Groundwater (phase-in allowance, incidental recharge allowance, and Groundwater Right Extinguishment Credit); and,
  - Reclaimed water (direct, non-potable reuse (indirect reuse), and recharge/recovery (groundwater) at 2,775 AFY.
- The future available water supply sources (build-out) for Gilbert is approximately 95,200 AFY. The build-out demand for Gilbert is expected to be 83,360 AFY. In normal years, there is a predicted surplus of approximately 11,840 AFY. However, under drought conditions there would be a deficit, which can be made up from stored normal year surpluses. In addition, Gilbert has a predicted 9,900 AFY of groundwater replenishment deficit that can be satisfied from stored reclaimed water.

- To efficiently manage its water resource portfolio, Gilbert will take the following actions:
  - Account for use of incidental recharge credit;
  - Deliver SRP supplies to the Southwest Water Reclamation Plant (SWWRP);
  - Utilize the reclaimed water exchange with SRP in years when SRP surface water is plentiful;
  - Excess SRP surface water, when available, should be recharged at the Granite Reef Underground Storage Project (GRUSP) and recovered monthly;
  - Deliver RWCD surface water supply to the SWWRP;
  - Utilize excess CAP water in the near term for “in-lieu” recharge credits while available;
  - Deliver available excess CAP water to GRUSP and the Riparian Preserve at Water Ranch for recharge and storage credits;
  - Acquire additional CAP water through lease or purchase;
  - Pursue acquisition of Irrigation Grandfathered Rights (IGR) through extinguishment and purchase;
  - Implement the South Recharge Site to store reclaimed water and excess Colorado River supplies; and,
  - Pursue utilization of supplies that may be available from RWCD.
- The AWS rules and restrictions applied to Gilbert began in 2001. This meant that groundwater could no longer be “mined”. Under the AWS rules, Gilbert was provided with a groundwater pumping allowance considered renewable or “safe yield”. Once the allowance is used up, access to groundwater is restricted to quantities that can be replenished with other renewable supplies. Thus, recharging renewable water supplies, as they are available, is a key water resource strategy that Gilbert must carefully manage.
- The available recharge facilities for Gilbert include: GRUSP; Gilbert Riparian Sanctuary; Vadose Zone Injection Well; and, Riparian Preserve at Water Ranch.
- For Gilbert to meet the goals of the PAMA, including safe yield, it is necessary to implement measures for demand reductions. Since Gilbert is impacted by rapid growth and commercial/industrial demands, Gilbert has entered into an agreement with ADWR to be regulated under the Non Per Capita Conservation Program. The agreement requires the adoption of certain management practices and ordinances to assure compliance with this program.

As shown in Table 1, Gilbert does not currently own or operate water supply wells within the boundaries of the Study Area. However, Mr. Greg Elliot of SRP, in an e-mail letter to MACTEC dated October 30, 2002, indicated that SRP Well 29E-1N, located at the intersection of Stapley Drive and Southern Avenue in Mesa (see Figure 1), is connected to the Gilbert water supply system (SRP, 2002b). According to SRP records, SRP Well 29E-1N has been minimally pumped since 1984, with a maximum amount of 1,506.84 af pumped during 1990 (SRP, 1996). From January 1991 through May 2002, a total of 42.79 af of water was pumped from SRP Well 29E-1N, with the well last being pumped during January 2000 (0.14 af pumped) (SRP, 2002a).

MACTEC sent a letter to Gilbert on October 18, 2002 requesting additional information regarding planned groundwater uses within the Gilbert segment. In a letter dated October 28, 2002, Gilbert indicated that they have no plans for installation and operation of new wells within the boundaries of the Study Area.

#### **2.2.2.2 City of Mesa**

The 2025 Mesa Water Resources Plan is a detailed planning document produced by Mesa that provides water demand and supply projections, updated information on supply acquisition efforts, reclaimed water projects, and actions needed to provide adequate water supplies for the future.

Mesa categorizes its water resources portfolio as “On Project” and “Off Project.” On Project is used to describe the lands within the boundaries of the SRP. Off Project describes the lands outside of the SRP boundaries, and include the RWCD lands. On Project water supplies cannot be used Off Project. Currently, On Project demand is approximately 69-percent of total demand in Mesa. Off Project demand has nearly doubled over the last ten years due to single-family housing and commercial development. Some key components of the plan include the following:

- On Project demand is expected to reach approximately 65,000 AFY by 2025. Current On Project supplies are approximately 76,000 AFY of renewable surface water. It appears that Mesa has enough surface water in the SRP region to support demand even at build-out levels.
- Off Project demand is expected to increase to approximately 110,000 AFY by 2025. Off Project supplies are expected to increase to 80,000 AFY at build-out, leaving a short fall of approximately 30,000 AFY.
- Additional sources identified by Mesa to make up the projected shortage includes:
  - Acquire additional CAP Subcontract water;
  - Develop infrastructure that is compatible with the available water resources/location/timing of water demands;
  - Negotiate an exchange with the Gila River Indian Community (GRIC), whereby 29,400 AFY of Mesa reclaimed water can ultimately be exchanged for 23,530 AFY of GRIC water;
  - Indian priority CAP water that can be used as a potable water supply;
  - Create additional Long-Term Storage Credits through local groundwater savings facilities and direct recharge facilities;
  - Continue to drill the wells necessary to recover stored water credits; and,
  - Develop the infrastructure necessary to make beneficial use of reclaimed water through storage underground for Long-Term Storage Credits and direct delivery to turf facilities.

- Mesa has also planned for drought periods when surface water supplies from the Colorado River, Salt River, and Verde River may be reduced. Also in 2030 the upper Colorado River basin states may make full use of their allocation of Colorado River water. For these reasons Mesa has accumulated 150,000 AFY of CAP Long-Term Storage Credits that can be pumped by any well in the Mesa service area. This could have an impact on the Study Area with its Mesa wells and SRP wells in and adjacent to the Study Area.
- Mesa plans to drill approximately two new wells per year to provide water for expected demand requirements and for potential drought conditions.
- Mesa currently obtains its water supply from the following:
  - 33 wells (106,000 AFY);
  - Southwest Water Reclamation Plant (SWWRP) (capacity of 9,000 AFY);
  - Northwest Water Reclamation Plant (NWWRP) (capacity of 9,000 AFY);
  - Phoenix 91<sup>st</sup> Avenue WRP (capacity of 32,000 AFY);
  - GRUSP (potential of 24,000 AFY);
  - NWWRP Ponds (potential of 6,000 AFY);
  - Water from the SRP (56,000 AFY);
  - Colorado River water (CAP)(entitled to 230,000 AFY);
  - RWCD (entitled to 3,200 AFY);
  - Salt and Verde River water (New Roosevelt Conservation Space)(entitled to 12,000 AFY);
  - Reclaimed water (credits for 25,000 AFY); and,
  - Pinal County Water Farms (potential of 28,000 AFY).

As shown in Table 1 and on Figure 1, the City of Mesa currently owns and operates a water supply well, identified as Mesa Well No. 14, within the Study Area and less than 0.5 miles downgradient from the identified boundary of the SMWRS groundwater contamination plume. Mesa also owns and operates two water supply wells slightly outside the boundaries of the Study Area, as shown on Figure 1. Mesa Well No. 10 is located northwest of the intersection of Center Drive and Broadway Road. Mesa Well No. 13 is located northwest of the intersection of Mesa Drive and Broadway Road. Though Mesa Wells 10 and 13 are located slightly outside the boundaries of the Study Area, recent pumping information for these wells, and Mesa Well No. 14, is provided below:

Well No.	Water Pumped in Acre-Feet (af)			
	2001	2000	1999	1998
Mesa No. 10	0	0	0	0
Mesa No. 13	17.8	511.1	705.26	557.89
Mesa No. 14	44.79	223.2	37.38	362.27

MACTEC sent a letter to Mesa on October 18, 2002 requesting additional information regarding planned groundwater uses within the Mesa segment. In a letter dated October 25, 2002, Mesa

indicated that they have no plans for installation of new wells within the boundaries of the Study Area. In regards to pumping of the existing wells, Mesa currently only pumps these wells during dry-up of SRP canals, in times of peak demand, or during surface water shortage.

### **2.2.2.3 Salt River Project**

The SRP at this time does not have a detailed Water Resources Plan. However, SRP does review its water needs three times per year and issues an internal report that is not made available to the public. SRP is actually two companies: the Salt River Project Agricultural Improvement and Power District, a political subdivision of the State of Arizona; and the Salt River Valley Water Users' Association, a private corporation. The Association delivers approximately 1-million AFY of water to agricultural, urban and municipal users in the Phoenix area. SRP also has approximately 2.3 million AFY of storage capacity.

The SRP obtains its water supply from the Salt River, Verde River, groundwater pumping (250 deep-wells), and recently from the CAP. When necessary, the SRP is allowed to borrow 100,000 AFY from the CAP. The SRP has approximately 131-miles of main canal system that brings domestic and irrigation water to the Phoenix area. SRP also operates and maintains six dams that create 6 lakes (Saguaro Lake, Canyon Lake, Apache Lake, Roosevelt Lake, Bartlett Lake, and Horseshoe Lake) that are part of the Salt and Verde River drainage.

The SRP has developed limited short-term water plans. Some key components of SRP's short term planning include the following:

- Provides 3 AFY of water to "water service area". An acre-foot is equivalent to 325,850 gallons.
- Stores water (water banking) for the future at the Granite Reef Underground Storage Project (GRUSP). Approximately 90,000 AFY of water was stored at GRUSP in 2000.
- Produces daily water reports (internal).
- Establishes water conservation program(s).
- Maintains an annual surplus of water (supply/storage minus delivery) of approximately 900,000 AFY.

As indicated in Table 1, SRP owns six water supply wells within the Study Area (SRP Well 28E-1S is listed with two ADWR Registration Numbers). Four of these wells, 28E-0N, 28.5E-1N, 29E-1N, and SRP Unnumbered, are located within the boundaries of the SMWRS. However, these wells have not been actively or continuously pumped since 1998. According to SRP, Wells 28E-0N and 28.5-1N are occasionally pumped to collect groundwater samples or perform pump maintenance. According to SRP, Well 28.5E-1N was most recently pumped during July 2002, during which time approximately 30.70 AF of water was extracted (SRP, 2002c). As of August 2002, SRP Well 28E-0N had not been pumped since November 2001, at which time the pump was operated for a short period of time to collect water quality samples. SRP Unnumbered is apparently inactive and no records were provided regarding this well.

As previously stated, SRP Well 29E-1N is apparently connected to the Gilbert water supply system. SRP apparently operates the well and acts as a supplier of water to Gilbert. According to SRP records, the well is minimally pumped and is apparently used as a backup water supply well by Gilbert.

MACTEC sent a letter to SRP on October 18, 2002 requesting additional information regarding planned groundwater uses within the Study Area. Mr. Greg Elliot of SRP contacted Mr. Jeffrey Bryan of MACTEC on October 23, 2002. Mr. Elliot stated that SRP does not plan on installing additional wells in the Study Area. According to Mr. Elliot, during 2003, SRP apparently plans on pumping a similar amount of water as they did from the wells in the Study Area during 2002. Based on this, SRP pumping plans are not apparently changing from their pumping rates for the last five years, which is minimal pumping for sampling and maintenance purposes.

### **2.2.3 Private Groundwater Use**

Private property owners within the Study Area may install an exempt (< 35 gallons per minute) domestic well on their property for personal use, provided that the well is permitted through ADWR. If the property owner has groundwater rights, they may install a nonexempt (> 35 gallons per minute) domestic or production well. The ADWR Well Registry Reports and water rights database were reviewed to identify potential private groundwater users within the Study Area. A list of registered private wells is shown in Table 1 and a list of parties holding non-exempt Type I rights within the Study Area is shown in Table 2.

As previously indicated, a Type II right is a floating right. Therefore, a party holding a Type II right within the PAMA can install a water supply well anywhere within the PAMA, including the Study Area. Table 3 provides a list of parties holding Type II rights within the PAMA.

### **2.2.3.1 Groundwater Use Survey**

The groundwater use survey consisted of mailing out groundwater use survey forms to property owners holding water rights within the Study Area. The survey was mailed out on December 9, 2002 to 37 property owners within the Study Area, with a request to respond back by January 10, 2003. Out of the 37 surveys mailed out, nine responses were received, and 14 forms were returned by the post office marked address unknown or insufficient address. Of the nine returned survey forms received, none of the property owners stated either ownership of a well, or plans to use groundwater in the future.

In addition to the survey forms, on January 27, 2003, the ADEQ contacted a Ms. Betty Coyle Hochstetter regarding the use of a domestic well (ADWR number 55-644248) on the property located at 740 East Eighth Avenue in Mesa, Arizona. Ms. Hochstetter no longer owns the property, but contended that there never was a well on the property. She believes that what was thought to be a well was really a giant hole in the ground formed as a result of the rotted roots of a removed pecan tree. Apparently the house was built on a former pecan orchard. She referred ADEQ to Ms. Nellie Owens Rogers who still lives in the area at 748 South Horne in Mesa and whose family owned the property which contained a pecan orchard. On February 14, 2003, the ADEQ talked with Ms. Rogers at her residence in Mesa. According to Ms. Rogers, there never was a well on the former Hochstetter property, but stated that wells were located along South Horne and have since been paved over. Ms. Rogers confirmed that her family and her father purchased the property in this area in the late 1800s and a pecan orchard had existed on it. The ADEQ then interviewed a Ms. Stella Diaz, sister of Vera Herrera, the current owner of the house at 740 East Eighth Avenue. Ms. Diaz stated that there was no well on the property, but that there was a hole in the backyard that they use to dispose of leaves. Apparently the hole never fills up even though they keep sticking leaves in it and at one time tried dumping dirt in the hole. The ADEQ did not observe any wells on the former Hochstetter property, but did observe the location of the hole filled with leaves. Based on the interviews and the site reconnaissance, potential use of groundwater from the Hochstetter well for domestic purposes has been ruled out.

## **2.2 SURFACE WATER USE**

The only surface water located within the Study Area is that of several shallow ponds at the Kokopelli Golf Club, located in the southwest corner of the Study Area. On March 23, 2000, John Lineman of Kokopelli Golf Club was contacted regarding the source of water for the ponds. Mr. Lineman indicated the water was obtained from Gilbert treated effluent supplies and from the Western Canal. The ponds are not supplied by pumped groundwater.

Other surface water bodies located closest to the Study Area are the Western Canal, which is located approximately 0.5 miles south of Guadalupe Road in Gilbert and Chandler, and the Consolidated Canal, which is located approximately 2 miles east. The Consolidated Canal is the largest canal in Mesa, approximately 18-miles long, and was not constructed to serve the lands within the present limits of Mesa or Gilbert. Possible recreational use of surface water immediately adjacent to the Study Area is highly unlikely.

### **3.0 SUMMARY OF USES**

#### **3.1 LAND USE**

According to Mr. Mark Gunning, current owner of the 1545 North McQueen Road property, the future land use for the former Applied Metallica Site is expected to remain general commercial (C-2). As shown on Figure 4, the former Applied Metallica Site is located in an area that is zoned by the Town of Gilbert as commercial and industrial. Based on future land use plans provided by the Town of Gilbert, there are no immediate plans to change the land use or zoning for this area.

The boundary between the Town of Gilbert and City of Mesa is Baseline Road. Therefore, the boundary of the Regional Groundwater Impact Area, which is also referred to as the PCE groundwater plume, extends into the City of Mesa. The portion of the Regional Groundwater Impact Area located in the area bounded by Mesa Drive on the west, US60 on the north, Stapley Drive on the east, and Baseline Road on the south, is zoned commercial by the City of Mesa. However, the portion of Regional Groundwater Impact Area located in the area bounded by Mesa Drive on the west, Broadway Road on the north, Stapley Drive on the east, and US60 on the south, is predominantly zoned residential by the City of Mesa. Based on future land use plans provided by the City of Mesa, there are no immediate plans to change the land use or zoning for the areas of the City of Mesa overlying the Regional Groundwater Impact Area.

#### **3.2 GROUNDWATER USE**

##### **3.2.1 Town of Gilbert**

Gilbert does not currently own production wells in the study area and has no plans to install additional wells within the Study Area boundaries. According to SRP, SRP Well 29E-1N, located at Stapley Drive and Southern Avenue and within the boundaries of the Study Area, is connected to the Gilbert water supply system. This well has not been extensively pumped, with a total of 42.79 af of water pumped from January 1991 through May 2002 (SRP, 2002a).

### **3.2.2 City of Mesa**

Mesa currently operates one production well, identified as Mesa No. 14, within the boundaries of the Study Area, and two production wells, identified as Mesa No. 10 and Mesa No. 13, slightly outside the Study Area boundaries. In regards to pumping of the existing wells, Mesa currently only pumps these wells during dry-up of SRP canals, in times of peak demand, or during surface water shortage. Mesa plans to continue this operation schedule. Mesa indicated that they have no plans for installation of new wells within the boundaries of the Study Area.

### **3.2.3 Salt River Project**

SRP currently owns six wells within the Study Area boundaries. These wells are not pumped on a regular basis and according to SRP there are no anticipated changes in the pumping schedule.

### **3.2.4 Private Groundwater Use**

The groundwater use survey has indicated the Cooley Well (55-636810), located at 765 E. Baseline Road, Gilbert, is the only identified current potential groundwater use by a private property owner within the Study area. ADEQ is attempting to contact Robert or Steve Fuller, current owners of this property, to verify the existence and use of the well.

Private property owners within the Study Area may install an exempt, less than 35 gallons per minute, domestic well on their property for personal use provided that the well is registered with the ADWR. This potential use should be considered. However, considering the fact that the private properties within the Study Area are connected to municipal water supplies and the cost for installing a production well, this use in the future is unlikely.

## **3.3 SURFACE WATER USE**

The Kokopelli Golf Club ponds are the only identified surface water bodies located within the Study Area boundary. However, the Kokapelli Golf Club ponds do not receive groundwater pumped within the Study Area boundaries. Therefore, the Kokapelli Golf Club ponds are not considered a surface water use within the Study Area. The Western Canal, which receives discharge from the SRP wells located in the South Mesa WQARF Registry Site, is the only surface

water use identified. As previously indicated, the Kokopelli Golf Club ponds do receive water from the Western Canal. However, considering the water originating from SRP Wells located in the Study Area discharges to the Western Canal at a point downstream of the Kokopelli Golf Club ponds, the ponds should not be impacted by future pumping of the SRP wells.

#### 4.0 REFERENCES

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<b>TABLE 1. REGISTERED WELLS WITHIN STUDY AREA</b>							
<b>Name</b>	<b>Location (cadastral)</b>	<b>ADWR Number</b>	<b>Use<sup>1</sup></b>	<b>Cased Depth (feet)</b>	<b>Screened Interval</b>	<b>Cased Diameter (inches)</b>	<b>Unit Screened</b>
Betty Hochstetter	A 1 5 26BD	55-644248	DOM	UN	UN	UN	UN
Mesa #14	A 1 5 26BDA	55-629605	MUN	954	350-954	20	MAU
SRP 29E-1N	A 1 5 26DDD	55-607699	MUN <sup>2</sup>	360	UN	24	UAU/MAU
SRP 27.5E-1N	A 1 5 27DCC	55-607679	IRR	685	UN	20	UAU/MAU
SRP 28E-0N	A 1 5 34DDD	55-607676	IRR	394	120-373	24	UAU/MAU
SRP Unnumbered	A 1 5 35ADC	55-618622	IRR	864	UN	20	UAU/MAU
SRP 28.5E-1N	A 1 5 35BAA	55-617845	IRR	549	190-549	20	UAU/MAU
Wolfswinkel Family	A 1 5 35DAD	55-623865	UN	UN	UN	UN	UN
SRP 28E-1S	D 1 5 3DDD	55-806724	IRR	168	UN	18	UAU
SRP 28E-1S	D 1 5 3DDD	55-617095	IRR	750	UN	24	UAU/MAU
Great Western Homes	D 1 5 2ADA	55-085124	UN	484	UN	8	UN
Eldon Cooley	D 1 5 2BAA	55-636810	UN	UN	UN	UN	UN
Eldon Cooley	D 1 5 2DAA	55-636811	UN	UN	UN	UN	UN
C. Nichols	D 1 5 2BB	55-800750	UN	220	UN	6	UN
H. Blau	D 1 5 2BBA	55-634032	UN	UN	UN	UN	UN

1. Use – domestic (DOM), irrigation (IRR), municipal (MUN), unknown (UN)
2. SRP Well 29E-1N is apparently connected to the Gilbert water supply system.

<b>TABLE 2. PARTIES HOLDING TYPE I RIGHTS</b>		
<b>Name / Company</b>	<b>Location (cadastral)</b>	<b>ADWR Water Rights Number</b>
Saint Lawrence Holdings	D01005002AA	58-103445.0002
SLHC Holdings Inc.	D01005002AA	58-103445.0005
SLHC Holdings Inc.	D01005002AAB	58-103445.0006
Standard Chartered Bank	D01005002AAG	58-103445.0007
Fred H. Hudson Family	D01005002AGG	58-104222.0001
Kaufman & Broad of Arizona	D01005002AGG	58-104222.0003
Eldon W. Cooley	D01005002DDE	58-104470.0001
Dorothy Irene Hancock	D01005002ACE	58-105452.0002
Billings Family LLC	D01005002AGE	58-105452.0003
Cooper Road Partners	D01005002ADE	58-105480.0001
Baseline Industrial	D01005003AF	58-105732.0000
Fuller	D01005002AB	58-106388.0001
Cardon Investments	D01005002C	58-108124.0001
American Sky	D01005002GG	58-108124.0005
Phoenix Fiesta	D01005002C	58-108124.0006
Rudyk	D01005002CH	58-108124.0007
Phoenician Commercial	D01005003AD	58-110664.0002
Brent W. Brown	D01005002DGE	58-111307.0000
Corporation of the Presiding Bishop (LDS)	D01005002DA	58-113096.0000
Farnsworth Construction	D01005003ACF	58-114287.0000
R & K Building Supply	D01005003AF	58-114317.0000
Phoenix Newspaper Inc.	D01005002BBH	58-114977.0001
Quinn E. Johnson	D01005002BBH	58-114977.0002
Junius Merl Farr	D01005002BBH	58-114977.0003
Wayne A. Hills	D01005002BBH	58-114977.0004
Eldon W. Cooley & Stadling	D01005002D	58-115578.0001
Talley Realty Development	D01005002BH	58-115578.0003
Talley Realty Development	D01005002CA	
Eldon W. Cooley & E	D01005002D	58-115581.0001
Stapley-Cardon Company	D01005002D	58-115581.0002
Donald O. Fuller, T.	A01005026DC	58-101699.0001
Corporation of the Presiding Bishop (LDS)	A01005026DC	58-101699.0002
Craig M. Berge	A01005035CE	58-104098.0001
Berge Ford Inc.	A01005035CE	58-104098.0002
Stewart Title & Trust	A01005026DDG	58-106274.0001
Phoenix Newspapers Inc.	A01005034DGG	58-106431.0000
Sequoia School LLC	A01005034BDG	58-109680.0001
Maricopa County	A01005034DGE	58-109793.0000
Emmett Jobe	A01005034DD	58-111182.0000

<b>TABLE 2. PARTIES HOLDING TYPE I RIGHTS</b>		
<b>Name / Company</b>	<b>Location (cadastral)</b>	<b>ADWR Water Rights Number</b>
Berge Ford, Inc.	A01005035CD	58-111498.0001
Buttrum Development	A01005035A	58-113879.0000
State Savings Mortgage	A01005035AD	58-113880.0001
State of Arizona	A01005034	58-114488.0000
State of Arizona	A01005035	
Mt Baldy LTD Partnership	A01005035	58-114800.0001
Theodore Neil Evans	A01005026AAA	58-115003.0000
Title Insurance Company of Minnesota	A01005026	58-115508.0000

**TABLE 3. PARTIES HOLDING TYPE II RIGHTS WITHIN PAMA**

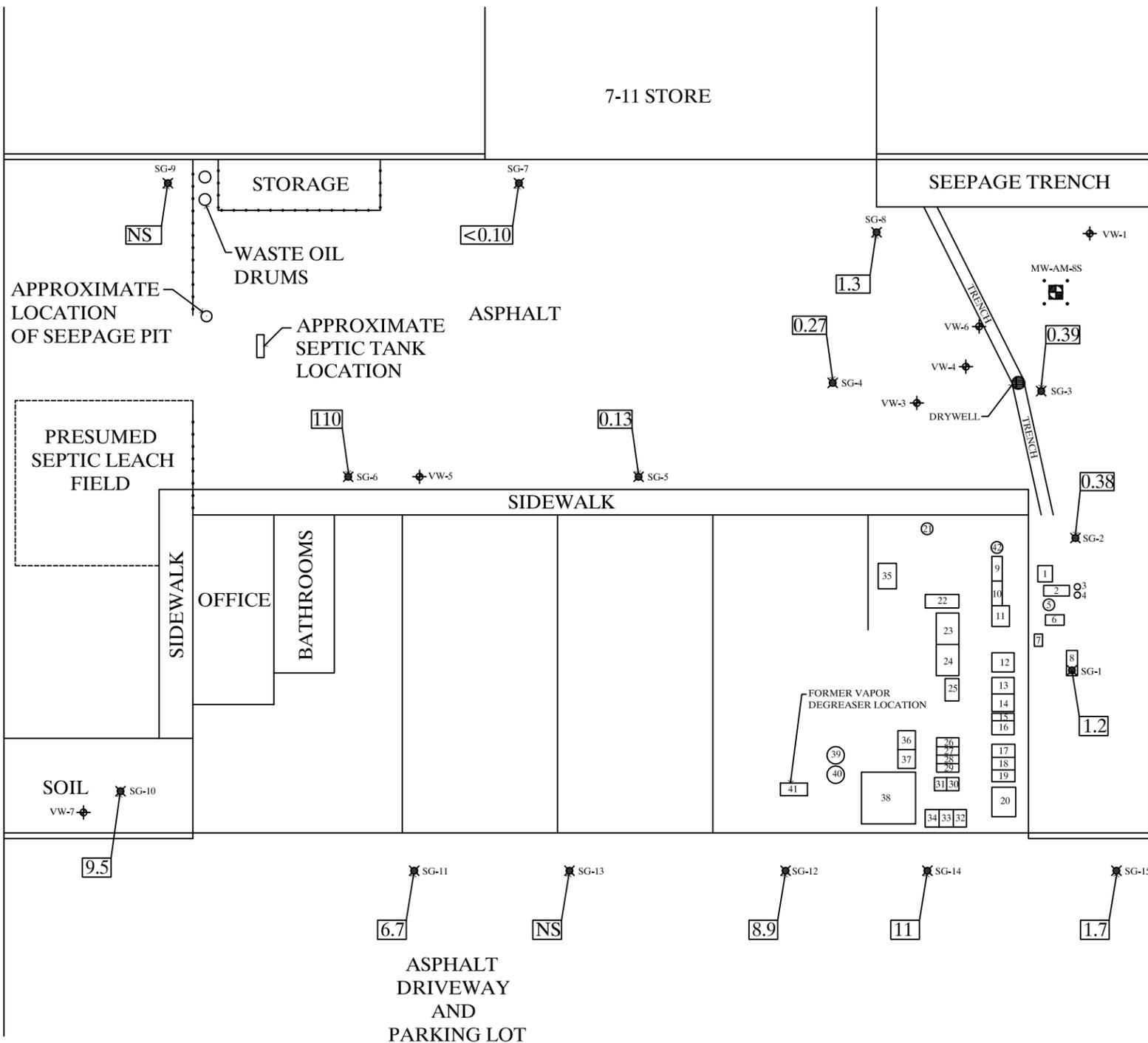
<b>Name / Company</b>	<b>Location / Use-AFY (2001)</b>	<b>ADWR Water Rights Number</b>
Lake Pleasant Associates	Floating / None	58-100616.0000
Walter C. Dana & B.J. Goebel	Floating / None	58-101102.0001
Trustee of Lenore U. Pincus	Floating / None	58-104090.0003
Tri City Ready Mix Inc.	Floating / None	58-104537.0001
Kent W. Rohner	Floating / None	58-104608.0002
Desert Mountain Development	Floating / None	58-105098.0003
Charlie B. & Burnelle Nichols	Floating / None	58-106536.0001
Thomas J. Nesbitt	Floating / None	58-106654.0001
State of Arizona	Floating / None	58-107223.0001
State of Arizona	Floating / None	58-107269.0001
State of Arizona	Floating / None	58-107272.0001
State of Arizona	Floating / None	58-107278.0001
William F. Jr. & Pamela K. Raney	Floating / None	58-108265.0002
Bruce G. & Norma Vaughan	Floating / None	58-108426.0001
James F. Wehmueller	Floating / None	58-108771.0002
Daniel J. Gainey & John Wicks	Floating / None	58-109995.0001
City of Phoenix	Floating / None	58-110749.0004
Charles P. Gould	Floating / None	58-111646.0001
Superstition Springs Investors	Floating / None	58-112100.0003
Bruce Patti Pierce	Floating / None	58-113277.0001
Treesweet Products Company	Floating / None	58-113792.0003
John A. & Angelina Vanderwey	Floating / None	58-113850.0003
Santa Lucia Farms GP	Floating / 4.7	58-113970.0003
Douglas Land Company LLC	Floating / None	58-115312.0002
State of Arizona	Floating / None	58-115441.0001
Bureau of Reclamation	Floating / None	58-115442.0001
James F. Wehmueller	Floating / None	58-130567.0002
Donald L. Anglin	Floating / None	58-130597.0001
State of Arizona	Floating / None	58-130816.0001



7-11 STORE

MCQUEEN ROAD

SIDEWALK



**TANK IDENTIFICATION**

1. TIN STRIP TANK - USED TO STRIP TIN AND CLEAN PARTS
2. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 1, 3 AND 4.
3. HYDROCHLORIC ACID (50%) TANK - USED TO CLEAN STEEL PARTS.
4. SAME AS TANK 3
5. BRIGHT DIP TANK - MIXTURE OF NITRIC ACID AND PHOSPHORIC ACID, USED TO CLEAN COPPER OR BRASS PARTS.
6. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 5, 7 AND 8.
7. NICKEL STRIP TANK - PROPANE HEATED SOLUTION USED TO STRIP NICKEL.
8. NITRIC ACID TANK - USED TO CLEAN OR STRIP PARTS.
9. TIN/LEAD TANK - USED TO PLATE PARTS (TIN).
10. TIN PLATE TANK - USED TO PLATE PARTS (TIN).
11. TIN PLATE TANK - USED TO PLATE PARTS (TIN).
12. COPPER/CYANIDE TANK - USED TO PLATE PARTS (COPPER).
13. COPPER/CYANIDE DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
14. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 12, 13, 15 AND 16.
15. SULFURIC ACID (50%) TANK - USED TO CLEAN PARTS.
16. SULFURIC ACID TANK - USED TO MAKE-UP AND HOLD RAW SULFURIC ACID SOLUTION.
17. HYDROCHLORIC (MURIATIC) ACID TANK - USED TO CLEAN STEEL PARTS.
18. HYDROCHLORIC (MURIATIC) ACID TANK - USED TO CLEAN COPPER AND BRASS PARTS.
19. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 17, 18 AND 20.
20. OAKITE 90 TANK - USED TO CLEAN PARTS.
21. CENTRIFUGE - USED TO SPIN DRY PARTS.
22. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 9, 10, 11 AND 23.
23. FLUOROBORIC TIN TANK - USED TO PLATE PARTS (TIN).
24. BRIGHT TIN TANK - USED TO PLATE PARTS (BRIGHT TIN).
25. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 24 AND 35.
26. DEIONIZED WATER TANK - USED TO PRE-RINSE PARTS PRIOR TO TANK 35.
27. DEIONIZED WATER TANK - USED TO PRE-RINSE PARTS PRIOR TO TANK 35.
28. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 26, 27 AND 29.
29. ACETIC ACID TANK - USED TO PRE-CLEAN PRIOR TO TANK 35.
30. NITRIC ACID TANK - USED TO CLEAN ALUMINUM.
31. ZINCATE TANK - USED TO PRE-CONDITION ALUMINUM.
32. IRIDITE TANK - USED TO PUT CHROMATE FINISH ON ALUMINUM.
33. IRIDITE DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
34. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 32 AND 33.
35. SULFURIC ACID/TIN TANK - USED TO PLATE PARTS (TIN).
36. OVERFLOW RINSE TANK - ASSOCIATED WITH PROCESS TANKS 37 AND 38.
37. ELECTROLESS NICKEL DRAGOUT TANK - USED TO PRE-RINSE PARTS PRIOR TO FINAL RINSE.
38. ELECTROLESS NICKEL TANK - USED TO PLATE PARTS (NICKEL).
39. ELECTROLESS NICKEL HOLDING TANK.
40. ELECTROLESS NICKEL HOLDING TANK.
41. TETRACHLOROETHYLENE VAPOR DEGREASER - USED TO DEGREASE PARTS TO BE PLATED.
42. SAME AS TANK 21.

**REFERENCE**  
 • APPLIED METALLICS, INC.  
 "TANK LOCATION DIAGRAM, FIGURE 2"  
 WESTERN TECHNOLOGIES, INC., 1989  
 • SOIL GAS SAMPLE LOCATIONS  
 APPLIED METALLICS SOUTH MESA  
 WQARF PROJECT AREA, GILBERT, AZ  
 FIGURE 2-1, EARTH TECH, 1995

**LEGEND**

- ✱ - SOIL GAS SAMPLE POINT WITH PCE CONCENTRATION IN MICROGRAMS/LITER
- - DRYWELL
- ⊕ - VAPOR EXTRACTION WELL
- ⊕ - GROUNDWATER MONITORING WELL



**APPLIED METALLICS SITE PLAN AND SOIL GAS SAMPLE LOCATION MAP**

**FIGURE 2**

MACTEC PROJECT NAME: SOUTH MESA WQARF  
 MACTEC PROJECT NO: 4972-06-2050.7.2  
 DATE: 05/14/07 E-FILE: 62050.7.2 FIG 2  
 DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_



MACTEC ENGINEERING AND CONSULTING  
 3630 E. WIER AVE.; PHOENIX, ARIZONA 85040  
 PHONE: (602) 437-0250 FAX: (602) 437-3675



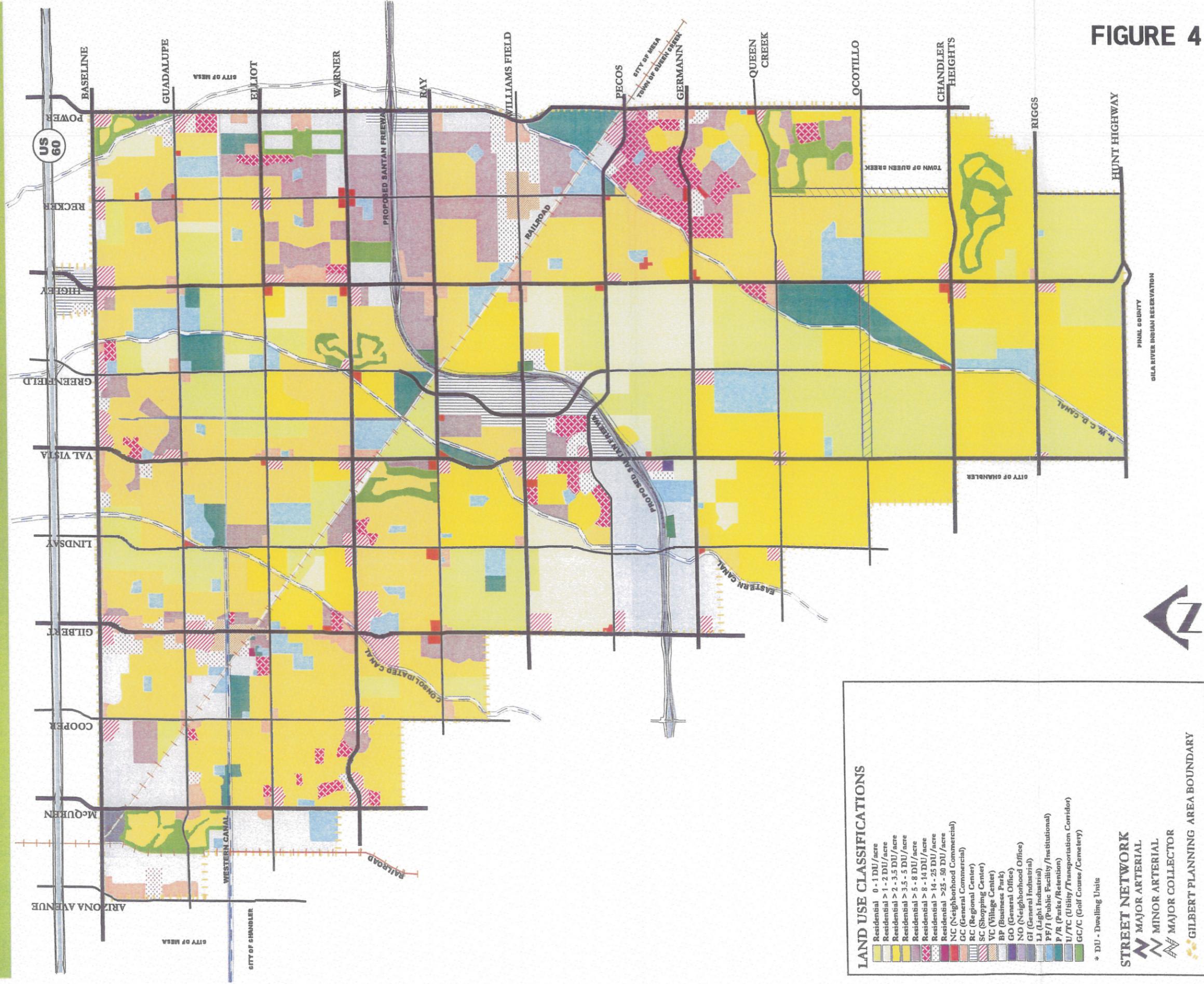


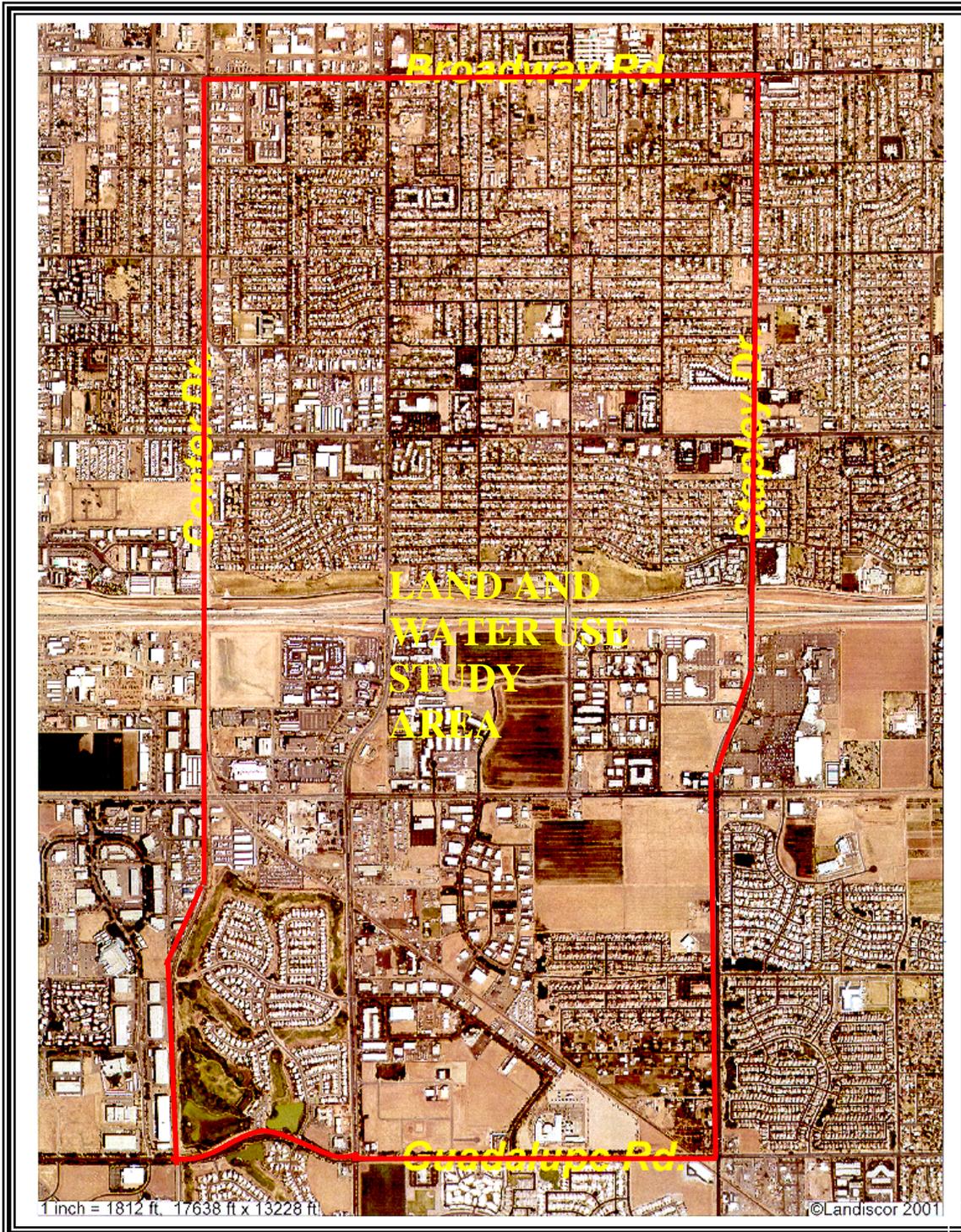
FIGURE 4



GILBERT  
ARIZONA

LAND USE MAP

k:\plan\_gis\advn\_planner\arcview\project\_files\land use (gsmaps\small)



**Site Boundaries Are Approximate**



Source: Landiscor Aerial Information, Negative #, Dated 2001

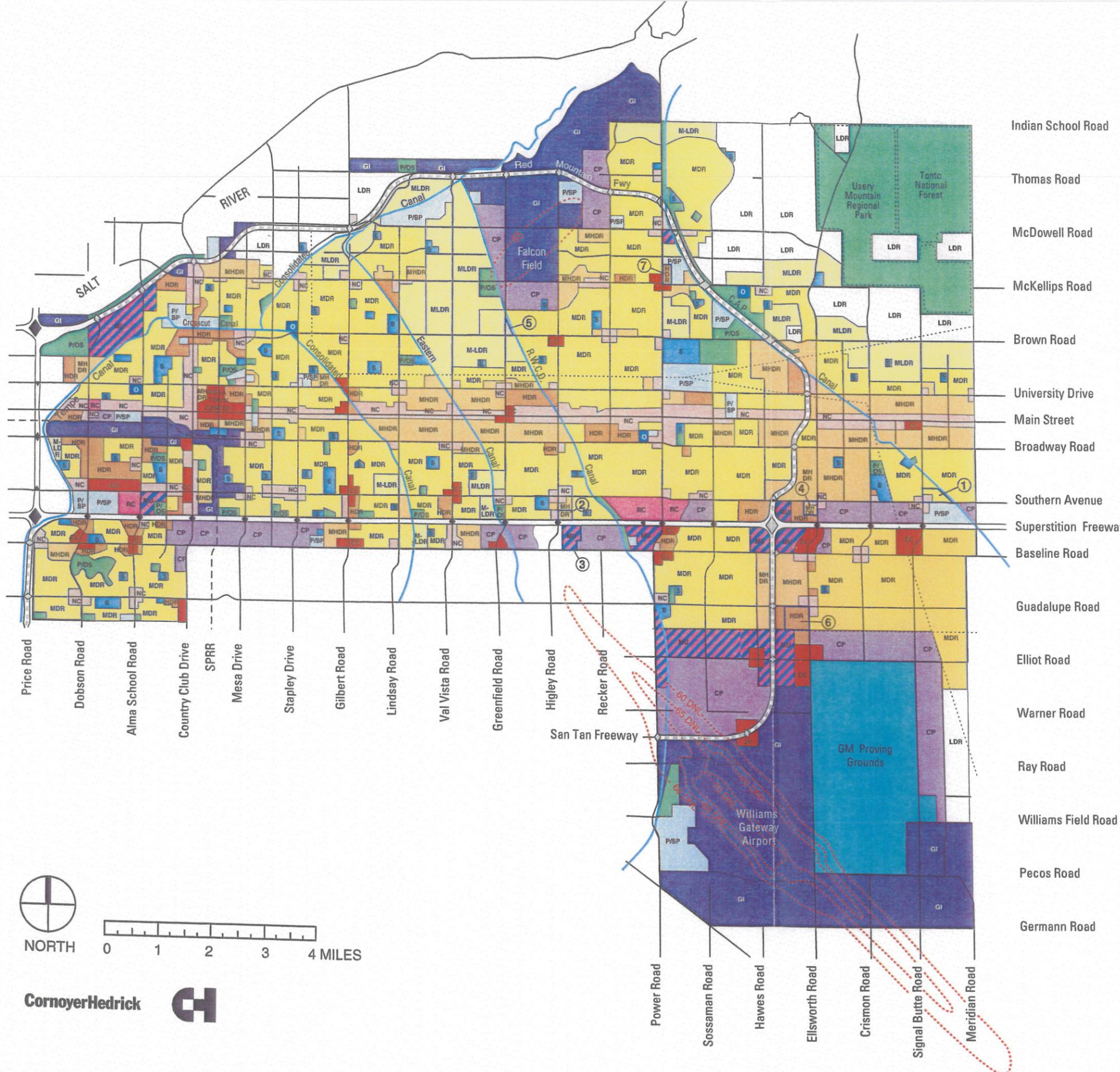
**AERIAL PHOTOGRAPH**

**FIGURE 5**

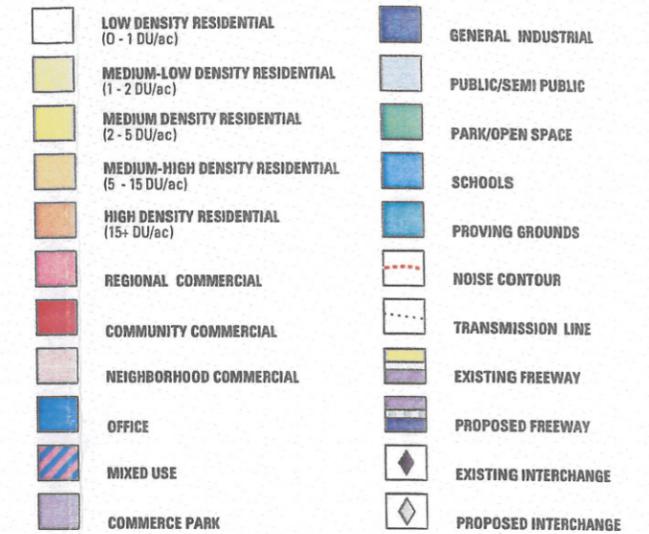
PROJECT NAME: South Mesa WQARF  
 PROJECT LOCATION: Mesa, AZ  
 PROJECT NO.: 4972-06-2050.7.2  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 REVIEWED BY: \_\_\_\_\_ DATE: \_\_\_\_\_



FIGURE 6



Land Use Categories

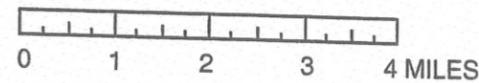


GP Land Use Map Amendments

- ① GP 97-1 NEC Signal Butte & Southern CC to MDR & NC
- ② GP 98-1 NEC Higley & US 60 CP to MHDR
- ③ GP 98-2 SEC Higley & US 60 CP to MU
- ④ GP 99-2 SWC Ellsworth & Southern CC to MHDR & NC
- Pending (2-1-00)
- ⑤ GP 99-1 NEC Greenfield & Brown NC to MHDR
- ⑥ GP 00-1 SWC Guadalupe & Ellsworth MDR to MHDR
- ⑦ GP 00-2 NEC McKellips & Power HDR to CC



NORTH

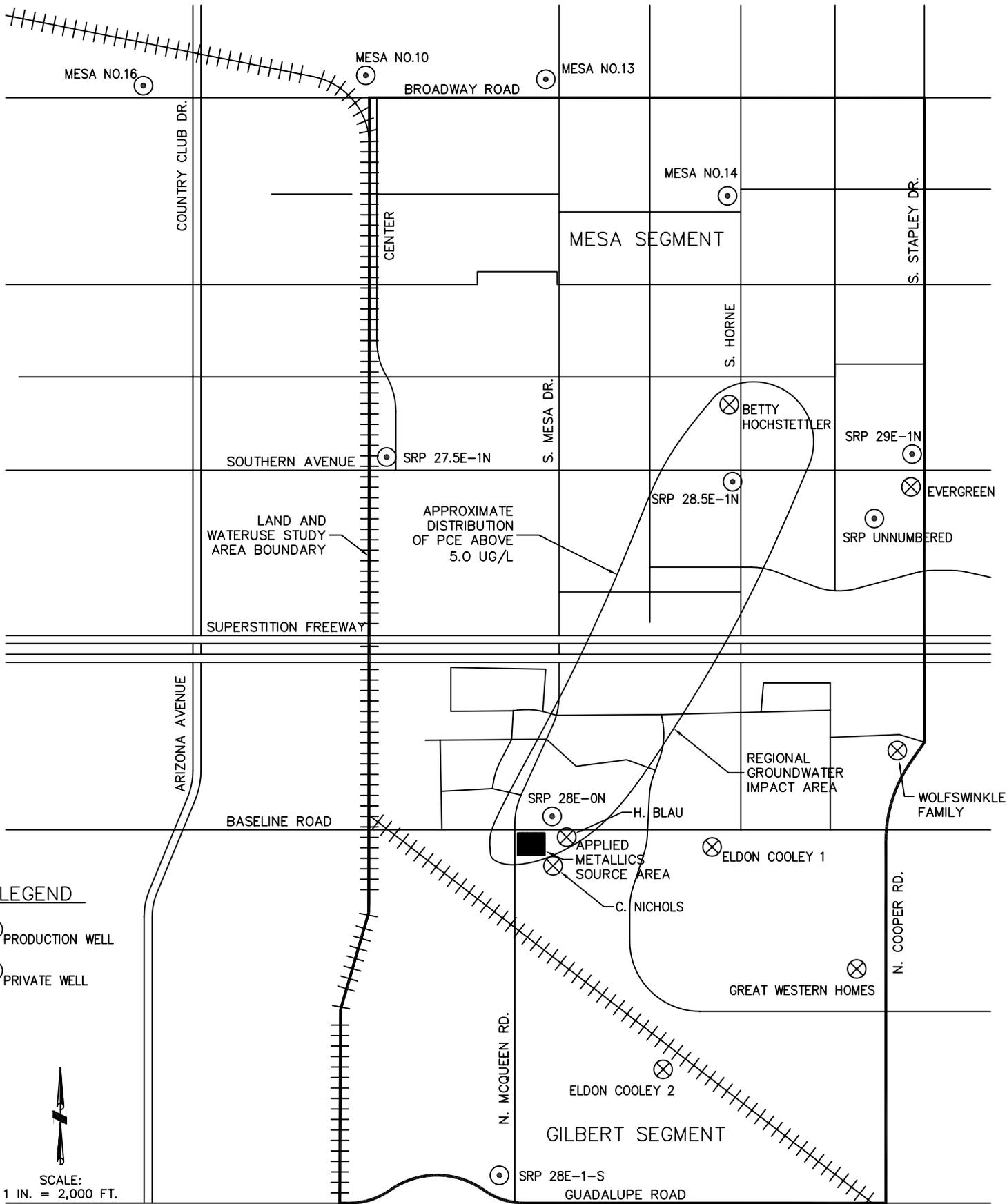


CornoyerHedrick



MESA GENERAL PLAN  
LAND USE PLAN

Updated February, 2000



**LEGEND**

- PRODUCTION WELL
- ⊗ PRIVATE WELL



SCALE:  
1 IN. = 2,000 FT.

**NON-MONITOR WELL LOCATION MAP**

**FIGURE 7**

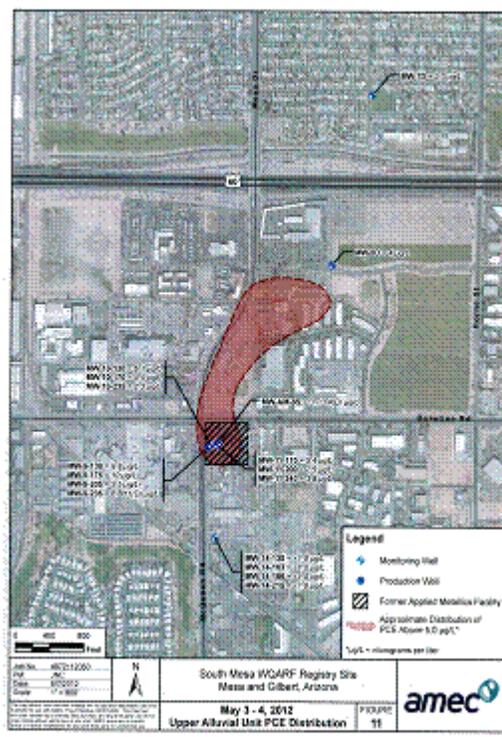
MACTEC PROJECT NAME: SOUTH MESA WQARF  
 MACTEC PROJECT NO: 4972-06-2050.7.2  
 DATE: 05/14/07 E-FILE: 62050.7.2 FIG 7  
 DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_



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**APPENDIX B**  
**REMEDIAL OBJECTIVES REPORT**

**FINAL REMEDIAL OBJECTIVES REPORT  
SOUTH MESA AREA  
WQARF REGISTRY SITE  
MESA AND GILBERT, ARIZONA**



February 15, 2013



Arizona Department of Environmental Quality  
Remedial Projects Unit  
1110 West Washington  
Phoenix, Arizona 85007

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	15

## LIST OF ABBREVIATIONS & ACRONYMS

AAC	Arizona Administrative Code
ARS	Arizona Revised Statutes
ADEQ	Arizona Department of Environmental Quality
AFY	Acre-Feet per Year
AWS	Assured Water Supply
AWQS	Aquifer Water Quality Standard
BDL	Below Detection Limit
CAB	Community Advisory Board
COC	Chemicals of Concern
COM	City of Mesa
1,1-DCE	1,1-dichloroethylene
ERA	Early Response Action
FS	Feasibility Study
MCL	Maximum Contaminant Level
PCE	Perchloroethylene
RO	Remedial Objective
RI	Remedial Investigation
SMWRS	South Mesa WQARF Registry Site
SRL	Soil Remediation Level
SRP	Salt River Project
SVE	Soil Vapor Extraction
TCE	Trichloroethylene
TOG	Town of Gilbert
VC	Vinyl Chloride
VOC	Volatile Organic Compound
WQARF	Water Quality Assurance Revolving Fund

## DEFINITIONS

**Remedial Measure:** A specific action taken in conjunction with remedial strategies as part of a remedy to achieve one or more of the remedial objectives. For example, remedial measures may include well replacement, well modification, water treatment, provision of replacement water supplies and engineering controls.

**Remedial Strategy:** One or a combination of the six general strategies identified in Paragraph B.4. of A.R.S.§49-282.06 and further defined in rules promulgated in accordance with this statute. In general, these strategies are as follows: plume remediation, physical containment, source control, monitoring, and no action.

**Reference Remedy:** A combination of remedial strategies and remedial measures which, as a whole, are capable of achieving remedial objectives. The reference remedy is compared with the alternative remedies for purposes of selecting a proposed remedy at the conclusion of the feasibility study.

**Alternative Remedy:** A combination of remedial strategies and remedial measures different from the reference remedy that is capable of achieving remedial objectives. The alternative remedies are compared with the reference remedy for purposes of selecting a proposed remedy at the conclusion of the feasibility study.

## 1.0 INTRODUCTION

The Arizona Department of Environmental Quality (ADEQ) has prepared this Remedial Objectives (ROs) report for the South Mesa Water Quality Assurance Revolving Fund Registry Site (SMWRS) to meet requirements established under Arizona Administrative Code (A.A.C.) R18-16-406. This RO report relies upon the Land and Water Use Study Report (Study Report) dated June 5, 2007. The Study Report is contained in Appendix A of the SMWRS Remedial Investigation Report prepared by AMEC for ADEQ.

ROs are established for the current and reasonably foreseeable uses of land and waters of the state that have been or are threatened to be affected by a release of a hazardous substance. Pursuant to R18-16-406(D), it is specified that reasonably foreseeable uses of land are those likely to occur at the site and the reasonably foreseeable uses of water are those likely to occur within one hundred years unless site-specific information suggests a longer time period is more appropriate.

Reasonably foreseeable uses are those likely to occur, based on information provided by water providers, well owners, land owners, government agencies, and others. Not every use identified in the Study Report will have a corresponding RO. Uses identified in the Study Report may or may not be addressed based on information gathered during the public involvement process, limitations of WQARF, and whether the use is reasonably foreseeable.

The ROs chosen for the site will be evaluated in the feasibility study (FS) phase of the WQARF process. The FS will evaluate specific remedial measures and strategies required to meet ROs. A remedial strategy is one or a combination of six general strategies identified in Paragraph B.4 of A.R.S. 49-282-06 (plume remediation, physical containment, controlled migration, source control, monitoring, and no action.) A remedial measure is a specific action taken in conjunction with remedial strategies to achieve one or more ROs (for example, well replacement, well modification, water treatment, water supply replacement, and engineering controls.)

The FS will propose at least three remedies (a reference remedy and generally two alternative remedies) capable of meeting ROs. A reference remedy is a combination of remedial strategies and measures capable of achieving ROs, and is compared with alternative remedies for purposes of selecting a proposed remedy. An alternative remedy is a combination of remedial strategies and measures different from the reference remedy; alternative remedies are compared with the reference remedy for purposes of selecting a proposed remedy. Proposed remedies will also be generally compatible with future land use specified by land owners.

The RO report has been prepared with stakeholder input gathered during the July 20, 2011 South Mesa (SM) community advisory board (CAB) and public meeting, as well as written solicitations received during the public comment period (Appendix A). A responsiveness summary is included in Appendix B. ADEQ shall issue the final remedial investigation (RI) report which shall contain the final RO report.

The ROs in this report will be stated in the following terms as required by the rule:

- (1) Protecting against the loss or impairment of each use;
- (2) Restoring, replacing, or otherwise providing for each use;
- (3) When action is needed; and
- (4) How long action is needed to protect or provide for the use.

## **2.0 REMEDIAL OBJECTIVES FOR LAND USE**

The SMWRS is located in the City of Mesa (COM) and Town of Gilbert (TOG) and is bounded approximately by 10th Avenue to the north, Stapley Drive to the east, and the railroad south of Baseline Road to the south and west. Generally, the SMWRS is located in a mixed urban, commercial and residential area. Based on the current zoning maps provided by the COM and the TOG, this area of the SMWRS is zoned as R-3 and C-2, which represent transitional and multi-family residential and general commercial zoning, respectively.

The boundary between the TOG and the COM is Baseline Road. The PCE groundwater plume extends into a portion of the COM that is zoned commercial. The area is bounded by Mesa Drive on the west, US highway 60 on the north, Stapley Drive on the east, and Baseline Road on the south and is predominantly zoned residential by the COM. Based on future land use plans provided by the COM, there are no immediate plans to change the land use or zoning for the areas of the COM overlying the PCE groundwater plume.

The former Applied Metallics, Inc. (AMI) site is located in the TOG. According to Mr. Mark Gunning, the current owner of the former AMI facility (1545 North McQueen Road), the future use of the former AMI site is expected to remain general commercial (C-2). Based on future land use plans provided by the TOG, there are no immediate plans to change the land use or zoning for this area.

After several years of investigations, the source area of the detected PCE was determined to be at the former AMI facility. Several Early Response Actions (ERAs) were performed to reduce the PCE detected in vadose zone soils at the site. Soil vapor extraction (SVE) systems removed approximately 1110 pounds of PCE from the vadose zone soils from June 1995 until June 1997. In September 2004 until mid-October 2007, the SVE system was started again and removed an additional 168 pounds of PCE from soils beneath the site building.

### **2.1 Remedial Objectives for Land Use**

The development of the properties for commercial/retail uses is proceeding and is reasonably feasible. The ROs for land use at the former AMI facility area are:

- 1) Protecting against the loss or impairment of each use;
- 2) Restoring, replacing, or otherwise providing for each use;
- 3) When action is needed; and
- 4) How long action is needed to protect or provide for the use.

### **3.0 REMEDIAL OBJECTIVES FOR GROUNDWATER USE**

The Water Use portion of the Land and Water Use Study Report is an inclusive summary of information gathered from discussions with SMWRS water providers, municipalities, well owners, and persons holding water rights. The water providers within the SMWRS are the City of Mesa (COM), Town of Gilbert (TOG), and the Salt River Project (SRP).

The Study Report involved a review of the following information that was obtained from the Arizona Department of Water Resources (ADWR): a list of persons holding groundwater withdrawal rights within the SMWRS area and a list of registered production wells within the SMWRS area. After the water providers, well owners, and persons holding water rights were identified, a survey was conducted to obtain information regarding current and future uses of groundwater within the SMWRS area. The Chemicals of Concern (COC) at the site are: tetrachloroethene (PCE) and trichloroethene (TCE). The following groundwater uses within the SMWRS have been identified: and are discussed in the following sections: 1) municipal use [drinking water], 2) SRP use, 3) agricultural use [irrigation] and 4) private use [including domestic, commercial, livestock and industrial].

#### **3.1 Municipal Groundwater Use**

Portions of the City of Mesa (COM) and portions of the Town of Gilbert (TOG) are located in the Phoenix Active Management Area (PAMA), an area where groundwater use is controlled and regulated. Parties have either a Type I or a Type II water right which allows them to pump and use groundwater.

##### **3.1.1 City of Mesa (COM)**

In 2010, the COM was re-designated as having a 100-year assured water supply that could meet all of the COM's current, committed, and future projected water demands. Part of the re-designation process recognized a groundwater allowance within the COM's water portfolio which was a water supply that could be used On- and Off-Project lands.

The COM has 79 active deep wells and currently operates one production well, identified as COM No. 14, located within the boundaries of the SMWRS. If the groundwater contaminant plume extends to the north again, COM Well #14 may become contaminated.

Two production wells, identified as COM No. 10 and COM No. 13, are located at the north end of the site. Currently, the COM only pumps these wells during dry-up of SRP canals, in times of peak demand, or during surface water shortage. The COM plans to continue this operating schedule. The COM indicated that they have no plans for installation of new wells within the boundaries of the SMWRS area.

### **3.1.2 Town of Gilbert (TOG)**

The TOG currently owns 13 production wells in the TOG area and the SRP owns 6 deep wells operated by the TOG to provide water to the TOG. SRP Well 29E-1N, located at Stapely Drive and Southern Avenue, is within the SMWRS boundaries and is connected to the TOG water supply system. A second TOG well is located within ½ mile and adjacent to the former AMI facility and cross-gradient to the contaminant plume. The well does not appear to be contaminated at this time. However, it is reasonably foreseeable that this well may become contaminated in the future.

In August 2010, the TOG was designated as having an adequate water supply through the ADWR's Assured Water Supply (AWS) program to meet the service area's water demands through 2025. ADWR determined that the TOG had adequate supplies to meet customer's demands through 2025. A portion of those supplies is Long Term Storage Credits (LTSC), which will be extinguished to offset future groundwater pumping.

### **3.1.3 ROs for Municipal Groundwater Use**

The ROs for municipal groundwater use in the SMWRS area are stated in the following terms:

- 1) Protecting against the loss or impairment of each use;
- 2) Restoring, replacing, or otherwise providing for each use;
- 3) When action is needed; and
- 4) How long action is needed to protect or provide for the use.

### **3.2 Salt River Project (SRP) Groundwater Use**

SRP currently owns five wells within the SMWRS boundaries. However, one well [SRP 28E-1S] is registered with two ADWR numbers) mistakenly making a person believe that SRP owns six wells in the area. The five SRP wells are:

- 1) SRP 28E-0N,
- 2) SRP 28.5E-1N,
- 3) SRP 29E-1N,
- 4) SRP 28E-1S and
- 5) SRP Unnumbered

PCE was consistently detected above the Arizona Water Quality Standard (AWQS) of 5.0 µg/L in SRP well 28E-0N. The well was taken off-line in 1983. SRP prepared a Remedial Action Plan (RAP) and installed a well head treatment system on the well. In 1996, influent groundwater PCE concentrations were routinely below the risk-based cleanup level of 33 µg/L and SRP removed the wellhead treatment system. SRP continued pumping the well for irrigation purposes.

Currently, the SRP wells are not being used, with the exception of the well that is connected to the TOG water system [SRP 29E-1N]. The remaining wells are not pumped on a regular basis and according to SRP; there are no anticipated changes in the pumping schedule.

While currently the wells provide water for irrigation, SRP anticipates that the wells will transition to drinking water supply in the reasonably foreseeable future, either by directly connecting the wells

to municipal water distribution systems or piping to municipal water treatment plants located on the SRP canal system as a drought supply.

### **3.2.1 ROs for SRP Groundwater Use**

The ROs for SRP groundwater use in the SMWRS area are stated in the following terms:

- 1) Protecting against the loss or impairment of each use;
- 2) Restoring, replacing, or otherwise providing for each use;
- 3) When action is needed; and
- 4) How long action is needed to protect or provide for the use.

### **3.3 Private Groundwater Use**

Private property owners within the SMWRS may install an exempt domestic well [less than 35 gallons per minute] on their property for personal use provided that the well is registered with ADWR.

#### **3.3.1 ROs for Private Groundwater Use**

As of February 2012, there were no private wells listed on ADWR's database for the area. Based on this information, no remedial objectives are needed at this time for private groundwater use.

### **3.4 Agricultural Groundwater Use**

The valley population continues to increase rapidly, and agricultural lands have been converted into commercial, residential (housing), and recreational (parks, golf courses, etc) uses. As of February 2012, no agricultural or irrigation wells were identified in the COM or the TOG SMWRS areas.

#### **3.4.1 ROs for Agricultural Groundwater Use**

Based on this information, no remedial objectives are needed for agricultural groundwater use.

## **4.0 REMEDIAL OBJECTIVES FOR CANAL/SURFACE WATER USE**

### **4.1 Western Canal Use**

The Western Canal, which receives discharge from the SRP wells located in the SMWRS, is the only identified surface water use. The Kokopelli Golf Club ponds do receive water from the Western Canal. Considering the water originating from SRP wells located in the SMWRS discharge to the Western Canal at a point downstream of the Kokopelli Golf Club ponds, the ponds should not be impacted by future pumping of the SRP wells.

#### **4.1.1 ROs for Western Canal Use**

Based on this information, no remedial objectives are needed for Western canal water use.

### **4.2 SRP Surface Water Use**

SRP's Western Canal trends east-west through the center of the SMWRS. In addition to the main canals, there are many lateral ditches that take water from the large canals to various delivery points. Water is routed into and through these laterals by a series of turn-out gates. Most laterals north of the Salt River in urban areas are underground. Many of the laterals that take water from canals in agricultural areas south of the river are open ditches.

#### **4.2.1 ROs for SRP Surface Water Use**

Based on this information, no remedial objectives are needed for SRP surface water use.

### **4.3 Surface Water Use**

The Kokopelli Golf Club ponds are surface water bodies located within the SMWRS. The Kokopelli Golf Club shallow ponds do not receive groundwater pumped within the SMWRS and are therefore not considered a surface water use within the SMWRS.

#### **4.3.1 ROs for Surface Water Use**

Based on the above information, remedial objectives are not needed for surface water use.

**APPENDIX A**

**COMMENTS RECEIVED AT THE 7/20/2011 CAB MEETING & WRITTEN  
SOLICITATIONS FOR PROPOSED ROs & RESPONSIVENESS SUMMARY**

## COMMENTS RECEIVED FOR THE REMEDIAL OBJECTIVES AT THE 7/20/2011 CAB - MEETING

We received proposed remedial objectives from two individual CAB members. Because there was not a quorum, the CAB as a whole could not submit ROs.

1. **Karl Kohlhoff:**

- *No additional action is necessary for the SM WQARF site. The site needs to be closed.*
- *Clean the source area (Applied Metallica – 1545 W McQueen) so that a business center can be built on it.*

**Response: Proposed RO: (Second bullet):** Protect against possible exposure to hazardous substances in surface and subsurface soils that could occur during development of property based upon applicable zoning regulations. This action will be needed for as long as the need for the water exists, the resource remains available and the contamination associated with the SMWRS site prohibits or limits groundwater use.

2, **Jay Clapp:**

- *Although ADEQ is close to “No additional action” at the site. Mr. Clapp is concerned about SRP and the COM pumping their wells in the future. He would like assurance that the wells are not going to be pumped. He would like to see SRP and the COM plug their wells closest to the plume to prevent them from being turned on and the water that is 12 ppb served as drinking water.*

**Response: Proposed RO:** To protect the supply of groundwater for municipal, irrigation, and private use and for the associated recharge capacity that is threatened by contamination emanating from the SMWRS site. To restore, replace or otherwise provide for the groundwater supply lost due to contamination associated with the SMWRS site. This action will be needed for as long as the need for the water exists, the resource remains available and the contamination associated with the SMWRS site prohibits or limits groundwater use.

## COMMENTS RECEIVED FROM WRITTEN SOLICITATIONS FOR PROPOSED REMEDIAL OBJECTIVES

ADEQ received one comment to the proposed ROs from the Salt River Project (SRP) hydrogeologist, Karol O. Wolf. Ms. Wolf submitted the following proposed ROs for the SMWRS site:

1. Prevent infiltration and leaching of contaminants of concern from soil to groundwater that would exceed their respective Aquifer Water Quality Standards (AWQS).
2. Protect human health and the environment by:
  - Ensuring groundwater meets all applicable end use water quality standards and
  - Ensuring conformance with applicable air quality regulations and standards.

**1. Response – Proposed RO:** Protect against possible leaching of hazardous substances in surface and subsurface soils to the groundwater.

**2. Response – Proposed RO:** To protect the supply for groundwater for municipal use and for the associated recharge capacity that is threatened by contamination emanating from the SMWRS site. To restore, replace or otherwise provide for the groundwater supply lost due to contamination from the SMWRS site. This action will be needed for as long as the need for the water exists, the resource remains available, and contamination associated with the SMWRS site prohibits or limits groundwater use.

## **RESPONSIVENESS SUMMARY: COMMENTS RECEIVED REGARDING SOLICITED REMEDIAL OBJECTIVES**

As per R18-16-406(I)(2), "during the public meeting the Department shall solicit and consider proposed remedial objectives (ROs) for the site." On July 20, 2010 the Arizona Department of Environmental Quality (AQEQ) held a public meeting where two oral solicitations were provided by the public for ADEQ's consideration. The solicitation period was held from June 30 through October 30, 2010. ADEQ requested both oral and written comments, issues and concerns during the solicitation of proposed ROs for the South Mesa WQARF Registry Site (SMWRS) Site.

ADEQ received two oral and one written solicitations for proposed ROs. This responsiveness summary is being issued in conjunction with the release of the proposed RO report. The proposed ROs report will be made available to the public for comment.

The proposed ROs report considered four criteria for their development:

- 1) Protect against the loss or impairment of the use;
- 2) Restore, replace or otherwise provide for each use;
- 3) Statement of when action is needed to provide for or protect against each use;
- 4) How long an action is required to protect or provide for each use.

ADEQ received proposed ROs from two individual CAB members. Because there was not a quorum, the CAB, as a whole, could not submit ROs.

### **Oral Comments on Proposed ROs Report**

ADEQ received a total of 3 oral comments from 2 Community Advisory Board (CAB) members regarding the proposed ROs:

#### **Karl Kohlhoff:**

1) "No further action is needed at the South Mesa WQARF site. The site needs to be closed."

**Response:** This comment refers to issues that are to be addressed in the feasibility study (FS) process. The FS may propose several remedies (a reference remedy and generally two alternative remedies) capable of meeting ROs. The FS process will also determine whether the Site qualifies for a "no further action determination:" in accordance with A.R.S. §287.01(F).

2) "The source area (the former Applied Metalics, Inc. facility) should be cleaned up so a business center can be built on it."

#### **Response:**

The objective of proposed RO is to protect against possible exposure to hazardous substances in surface and subsurface soils that could occur during property development. Using information collected during the remedial investigation, the FS process will identify proposed remedies that will be capable of achieving ROs and selecting a preferred remedy which will (1) assure the protection of public health, welfare and the environment, (2) provide for the control, management, and cleanup of hazardous substances, and (3) be reasonable, necessary, cost effective, and technically feasible. Appropriate remedial actions will be implemented after the Proposed Remedial Action Plan (PRAP) and record of decision (ROD) are finalized and continued until hazardous substances causing the impairment or restriction to the land use are remediated.

#### **Jay Clapp:**

3) Mr. Clapp is concerned about the Salt River Project (SRP) and the City of Mesa (COM) pumping their wells in the future. He suggested that SRP and the COM plug their wells closest to the contaminant plume to prevent contaminated water from being served as drinking water.

#### **Response:**

Based on the most recent groundwater sampling event (April-May 2012), the SRP and COM wells are not in the direction of the current groundwater contaminant plume. The RO will be to restore, replace or otherwise provide for the groundwater supply lost due to contamination associated with the South Mesa WQARF site. This action will be implemented after the PRAP and ROD are finalized and continued for as long as the need for the water exists, the resource remains available and the contamination associated with the South Mesa WQARF site prohibits or limits groundwater use.

ADEQ received one written comment to the proposed ROs submitted by Karol O. Wolf of SRP to those proposed for the South Mesa WQARF site:

**Karol Wolf:**

Prevent infiltration and leaching of contaminants of concern (COCs) from soil to groundwater that would cause the groundwater to exceed the respective Aquifer Water Quality Standards (AWQS).

**Response:**

1) The proposed RO is to protect against possible leaching of hazardous substances in surface and subsurface soils to groundwater. A soil vapor extraction (SVE) system operated at the Site from 1995 to 1998 and from 2002 to 2008. More than 1,275 pounds of chlorinated solvents were removed from soils at the Site. Recent groundwater sampling indicated that chlorinated solvents were not moving from subsurface soils to groundwater.

Using information collected during the remedial investigation, the FS process will identify proposed remedies that will be capable of achieving ROs and selecting a preferred remedy which will (1) assure the protection of public health, welfare and the environment, (2) provide for the control, management, and cleanup of hazardous substances, and (3) be reasonable, necessary, cost-effective, and technically feasible. Appropriate remedial actions will be implemented after the PRAP and finalized in the ROD. Operations will continued until hazardous substances causing the impairment or restriction to the land use and/or groundwater use are remediated.

2) Protect human health and the environment by ensuring groundwater meets all applicable end use water quality standards.

**Response:**

The proposed RO is to protect the supply of groundwater and the associated recharge capacity that is threatened by contamination emanating from the South Mesa WQARF site. A second proposed RO is to restore, replace or otherwise provide for the groundwater supply lost due to contamination associated with the South Mesa WQARF site. This action will be needed for as long as the need for the water exists, the resource remains available and the contamination associated with the South Mesa WQARF site prohibits or limits groundwater use.

3) Protect human health and the environment by ensuring conformance with applicable air quality regulations and standards.

**Response:**

The proposed RO is to protect human health and the environment by ensuring compliance with applicable air quality standards. Appropriate remedial actions will be implemented after the PRAP and ROD are finalized and continued until hazardous substances causing the impairment or restriction to the land use are remediated.

## **APPENDIX C**

### **SRP WELL 28.5E-1N MODIFICATION REPORT**

( Final permit documents )



**SALT RIVER PROJECT**

POST OFFICE BOX 52025  
PHOENIX, ARIZONA  
85072-2025  
(602) 236-5900

Operations Division  
Arizona Department of Water Resources  
500 North 3<sup>rd</sup> Street  
Phoenix, AZ 85004-3903

RE: Document submittal to finalize recently completed well modification work. (SRP well 28.5E-1.0N, ADWR registration # 55-617845).

Upon recent consultation with Al Ramsey of ADWR, SRP is submitting the following documents:

- Well Driller Report
- Completion Report (Pump Completion Report)
- Finalized As-Built diagrams

It is SRP's understanding that this action will complete the paperwork required by ADWR for the work done at this well.

If there are any questions, please feel free to call Mark Freebury at 236-2267 or Mark Hay at 236-2683. Thank you for your attention.

Sincerely,

A handwritten signature in cursive script that reads "Mark Freebury".

Mark Freebury

STATE OF ARIZONA  
DEPARTMENT OF WATER RESOURCES  
GROUNDWATER MANAGEMENT SUPPORT SECTION  
500 North Third Street - Phoenix, Arizona 85004-3903  
Phone (602) 417-2470

**WELL DRILLER REPORT**

This report should be prepared by the Driller in all detail and filed with the Department within 30 days following completion of the well.

1. Owner's Name: SALT RIVER PROJECT (SRP)  
 Address: 16ST52 - P. O. Box 52025 Phoenix AZ 85072-2025 (602) 236-5181  
 Street City State Zip Telephone Number
2. Drilling Firm: SRP  
 Address: \_\_\_\_\_  
 Street City State Zip Telephone Number
3. Location: NE  $\frac{1}{4}$  NE  $\frac{1}{4}$  NW  $\frac{1}{4}$  of Section 35 Township 1 North Range 5 East  
 10 Acre 40 Acre 160 Acre
4. Well Registration No. 55- 617845 (Required)
5. Permit No. \_\_\_\_\_ (If issued)

**DESCRIPTION OF WELL**

6. Total Depth of Hole 549' (\* See Remarks) ft.
7. Type of Casing 8 ga. Stovepipe (Mild Steel)
8. Diameter and length of casing 20 inches from 0 to 495', 16 inches from 495' to 549'
9. Method of sealing at reduction points Unknown
10. Perforated from 190' to 495' from 512' to 549' from \_\_\_\_\_ to \_\_\_\_\_
11. Size of cuts 5/8" x 4 1/2" Number of cuts per foot Ten in 20" / Eight in 16"
12. If screen was installed: Length n/a feet. Diameter \_\_\_\_\_ inches. Type \_\_\_\_\_
13. Method of construction Drilled - Cable Tool  
 (drilled, dug, driven, bored, jetted, etc.)
14. Date started September 27 1951  
 Month Day Year
15. Date completed December 24 1951  
 Month Day Year
16. Depth to water 137' (1/96)ft. (If flowing well, so state).
17. Describe point from which depth measurements were made, and give sea-level elevation if available \_\_\_\_\_  
Land Surface / Elevation: 1223 feet above Sea Level

18. If flowing well, state method of flow regulation:
19. Remarks: \* This well was modified in April 1997.  
Original depth was 700'. Backfill modification  
reduced total Hole Depth to 549'.

FOR DEPARTMENT USE ONLY	
Registration No. _____	
File No. _____	
Received _____	By _____
Entered _____	By _____



STATE OF ARIZONA  
ARIZONA DEPARTMENT OF WATER RESOURCES  
GROUNDWATER MANAGEMENT SUPPORT SECTION

500 North Third Street, Phoenix, Arizona 85004-3903  
Phone (602) 417-2470

COMPLETION REPORT  
(Pump Installation Report)

1. Per A.R.S. § 45-600, the Completion Report is to be filed with the Department within 30 days after installation of pump equipment by the registered well owner.
2. Drawdown of the water level for a non-flowing well should be measured in feet after not less than 4 hours of continuous operation. For a flowing well the shut-in pressure should be measured in feet above the land or in pounds per square inch at the land surface.
3. The static groundwater level should be measured in feet from the land surface immediately prior to the well capacity test.
4. The tested pumping capacity of the well in gallons per minute for a non-flowing well should be determined by measuring the discharge of the pump after continuous operation for at least 4 hours and for a flowing well by measuring the natural flow at the land surface.

REGISTRATION NO: 55- 617845

FILE NO: A.(1-5) 35 baa

LOCATION OF THE WELL:

1 (NS) 5 (EW) 35  
Township Range Section  $\frac{1}{4}$  NE  $\frac{1}{4}$  NE  $\frac{1}{4}$  NW  
10-acre 40-acre 160-acre

EQUIPMENT INSTALLED:

Kind of pump Turbine Kind of power Electric  
Turbine, submersible, centrifugal, etc. (Electric, natural gas, gasoline, etc.)  
H.P. Rating of Motor 200 Pumping Capacity 2300 Date Pump Installed 5-1-97

WELL TEST:

Test pumping capacity \_\_\_\_\_ Date Well Tested: \_\_\_\_\_  
Gallons per minute

Method of Discharge Measurement \_\_\_\_\_  
Weir, orifice, current meter, etc.

Static Groundwater Level \_\_\_\_\_ ft. Drawdown \_\_\_\_\_ ft.

Total Pumping Lift \_\_\_\_\_ ft. Drawdown \_\_\_\_\_ lbs.  
(Flowing Well)

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief.

Print Well Owner's Name \_\_\_\_\_ Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

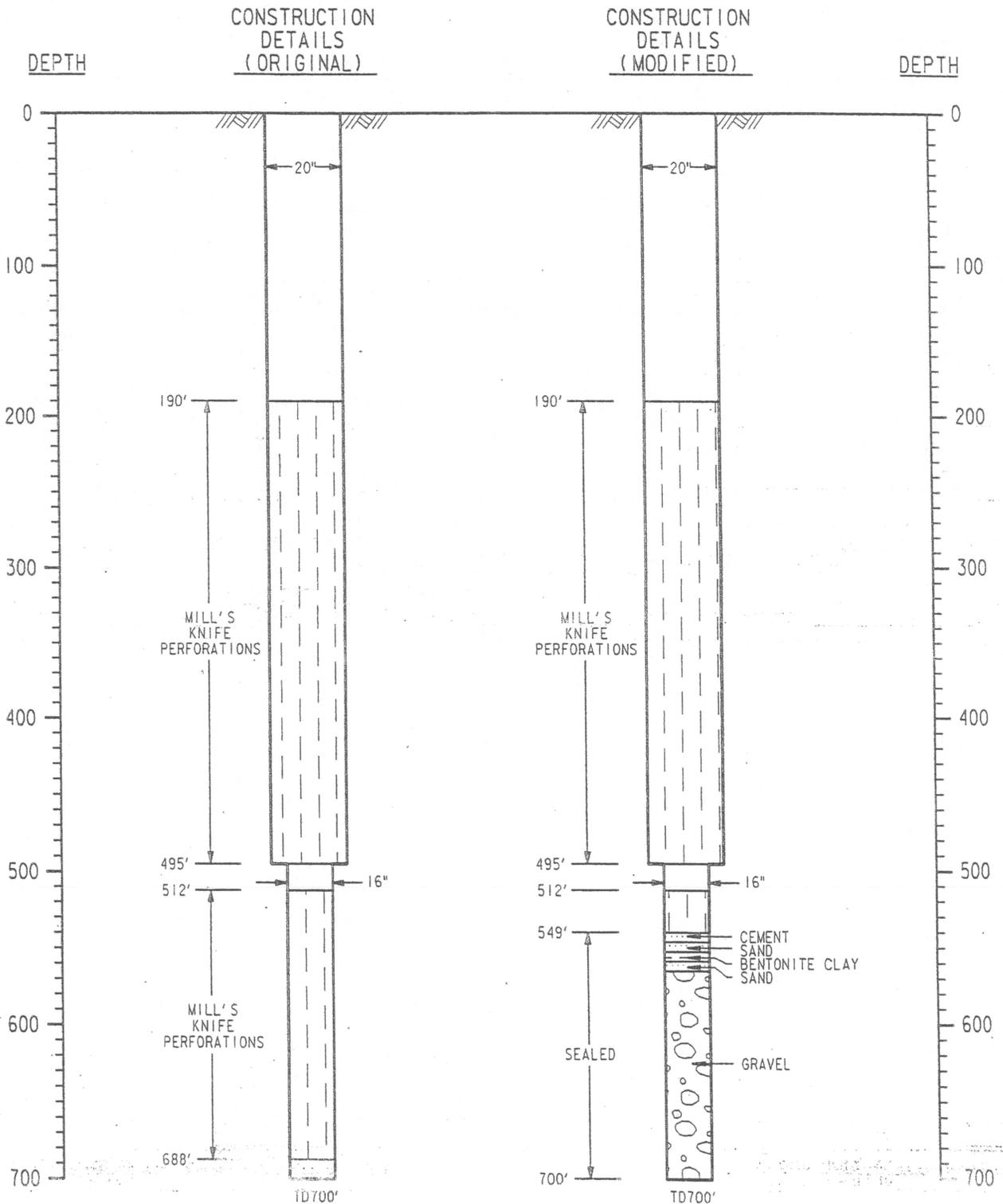
Signature of Well Owner \_\_\_\_\_ Phone Number \_\_\_\_\_ Date \_\_\_\_\_

# WELL MODIFICATION

## SRP WELL: 28.5E - 1.0N

File No.: A(1-5)35baa

Reg. No.: 55-617845



# WELL MODIFICATION

## SRP WELL: 28.5E - 1.0N

