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BEFORE THE ARIZONA CORPORATION COMMISSION

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ORIGINAL

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY, AND FOR ADJUSTMENTS TO ITS RATES AND CHARGES FOR UTILITY SERVICE FURNISHED BY ITS WESTERN GROUP AND FOR CERTAIN RELATED APPROVALS.	DOCKET NO. W-01445A-15-0277 **NOTICE OF FILING OF CENTRAL ARIZONA PROJECT WATER USE PLANS**

Arizona Water Company, an Arizona corporation, hereby files updated Central Arizona Project ("CAP") Water Use Plans for its Pinal Valley and White Tank service areas. On July 31, 2015, Arizona Water Company filed in this docket a Notice of Intent to File General Rate Case and Request for Accounting Order. In that filing, Arizona Water Company stated that its general rate case will focus on its plan to put its Western Group CAP water allocations to full beneficial use. Arizona Water Company submits the attached CAP Water Use Plans for the Pinal Valley and White Tank service areas in advance of its general rate case application in order to aid the parties in their reviews and analyses.

RESPECTFULLY SUBMITTED this 7th day of August, 2015.

ARIZONA WATER COMPANY

Arizona Corporation Commission
DOCKETED
AUG 07 2015
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Arizona Water Company

Pinal Valley
Central Arizona Project
Water Use Plan

2015 Update

August 7, 2015

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1. Introduction

In this 2015 Central Arizona Project ("CAP") Water Use Plan ("2015 CAP Use Plan"), Arizona Water Company ("Arizona Water") presents its plan to deliver CAP water to its customers through underground storage and recovery beginning in 2015. The estimated construction cost of Arizona Water's underground storage and recovery project is $5.8 million making it a practical, cost-effective and financially feasible alternative to surface water treatment and direct delivery of CAP water which would cost $94 million.

Arizona Water's earlier 2006 CAP Use Plan (filed with the Arizona Corporation Commission pursuant to Decision No. 68302 on December 29, 2006), called for Arizona Water to design and construct a 10 million gallon per day ("MGD") surface water treatment plant at an estimated cost (in 2006 dollars) ranging from $34 million to $66 million to deliver treated CAP water directly to customers in its Pinal Valley (i.e., Casa Grande and Coolidge) service area. In 2014, after further refinements to design specifications and a general increase in equipment, materials, and construction costs, that cost estimate grew by more than 40% to $94 million. As a result, Arizona Water developed a far less costly and more efficient means of delivering much needed CAP water to Arizona Water's Pinal Valley customers than by constructing a costly and labor intensive surface water treatment plant.

Arizona Water's plan to use CAP water to serve its customers through recharge and recovery coincides with the State of Arizona's public policy directives on water storage and water savings. More specifically, Arizona's policy on water storage, water savings and replenishment, as codified in Arizona Revised Statutes ("A.R.S.") Section §45-801.01 states:

The public policy of this state and the general purposes of this chapter are to:

> *1. Protect the general economy and welfare of this state by encouraging the use of renewable water supplies, particularly this state's entitlement to Colorado river water, instead of groundwater through a flexible and effective regulatory program for the underground storage, savings and replenishment of water.*
>
> *2. Allow for the efficient and cost-effective management of water supplies by allowing the use of storage facilities for filtration and distribution of surface water instead of constructing surface water treatment plants and pipeline distribution systems.*

Arizona Water's use of CAP water through groundwater recharge, storage, and recovery, as described in this 2015 CAP Use Plan, complies with and advances this crucial public policy by using Colorado River water delivered by CAP. Arizona Water's plan also advances this policy by efficiently and cost-effectively managing water supplies through the use of underground storage facilities and recovery wells, instead of constructing a very costly and labor intensive surface water treatment plant.

This 2015 CAP Use Plan provides an overview of water supplies and demands in the Pinal Active Management Area ("AMA"), both historical and projected, which also shows the state's over-reliance on over drafting native groundwater, i.e., pumping groundwater faster than it is replaced naturally. According to the Arizona Department of Water Resources ("ADWR"),

increased over-reliance on native groundwater throughout the Pinal AMA threatens the sustainability of groundwater supplies for the Pinal AMA including Arizona Water's Pinal Valley service area.[1] As a result, there is a demonstrated need to maximize the beneficial use of renewable water supplies such as CAP water as soon as practicable. Recharging CAP water at an underground storage facility, besides being an efficient and cost-effective way to manage Arizona Water's CAP water allocations, is consistent with the policies and recommendations of ADWR, CAP, and the Arizona Water Banking Authority ("AWBA") in the studies and reports listed below.

Furthermore, Arizona Water's use of CAP water as described in this 2015 CAP Use Plan conserves and protects groundwater in compliance with Arizona's 1980 Groundwater Management Act as codified in A.R.S. §45-401(B) which states:

> *"It is therefore declared to be the public policy of this state that in the interest of protecting and stabilizing the general economy and welfare of this state and its citizens it is necessary to conserve, protect and allocate the use of groundwater resources of the state and to provide a frame work for the comprehensive management and regulation of the withdrawal, transportation, use, conservation and conveyance of rights to use the groundwater in this state."*

In addition, Arizona Water's use of CAP water as discussed in this 2015 CAP Use Plan furthers the Pinal AMA management goal by reducing the amount of groundwater pumped by nearly 80,000 acre-feet over the next ten years, thereby preserving those supplies for future non-irrigation uses. Recharging CAP water in underground storage and groundwater savings facilities also protects against shortages when deliveries of CAP from the Colorado River are cut back or curtailed.

The City of Coolidge incorporated Arizona Water's Pinal Valley Recharge and Recovery Facility in the water resources section of its 2025 General Plan, which was adopted by the City Council on June 23, 2014. Coolidge voters approved the City's 2014 General Plan in a general election held on November 4, 2014.[2]

2. Underground Storage and Recovery

2.1. Background

In the 1980s, Arizona's need to replenish its dwindling groundwater aquifers, coupled with the availability of surface water supplies, led to development of an active groundwater storage and recovery program. Since that time, storage and recovery (also known as recharge and recovery) has emerged as one of the most important and effective water management tools for the state, particularly in meeting Arizona's policy goals of protecting the general economy and welfare of the state by using renewable supplies, such as CAP water,

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[1] Arizona Department of Water Resources, *Draft Demand and Supply Assessment, 1985 – 2025 Pinal Active Management Area*

[2] *See* Appendix A-1, Copy of Water Resources Element of City of Coolidge 2025 General Plan

instead of relying on over drafted groundwater.[3] As further evidence of the benefits of storing CAP water underground, ADWR's demand and supply assessment for the Pinal AMA identified replenishment of groundwater with surface water such as CAP water (or treated wastewater effluent), as a flexible, cost-effective approach to making beneficial use of these much-needed renewable water supplies. [4]

ADWR is the state agency that administers Arizona's storage and recovery program and has primary responsibility for enforcing laws and regulations governing storage and recovery through a system of permits and reporting requirements. ADWR also maintains records of all storage facilities and tracks the amount of water stored by each permit holder in separate water storage accounts for each such permit holder. No entity may store water underground without an ADWR issued water storage permit. In addition, entities storing water may not physically recover such water without an ADWR issued recovery well permit. Storing water underground accrues annual or long-term storage credits depending on the eligibility of the entity storing water and the timing of recovery.

Under ADWR's recharge and recovery program, permit holders can store water at either underground storage facilities or groundwater savings facilities. Typically, underground storage facilities are designed and constructed to use recharge (or spreading) basins where water percolates and directly recharges the groundwater aquifer through infiltration. Other types of underground storage facilities, such as shallow wells (vadose zone) or deep injection wells, are used when recharge basins are impractical or technically not feasible. In the alternative, groundwater savings facilities are used for "indirect" recharge, and are operated by agricultural irrigation districts that normally pump groundwater. These groundwater savings facility operators have facilities in place to receive deliveries of CAP water in lieu of the agricultural irrigation districts having to pump groundwater, thereby saving groundwater and creating groundwater storage credits equal to the quantity of CAP water delivered to the irrigation district. As a result, the groundwater aquifer is recharged indirectly by saving groundwater (hence, the term *groundwater savings facilities*).

2.2. Arizona Water's Pinal Valley Recharge and Recovery Facility

Arizona Water holds CAP water allocations totaling 10,884 acre-feet per year in its Pinal Valley service area. Arizona Water delivered 1,928 acre-feet of CAP water to provide water service to customers for direct non-potable uses in 2014.

In order to put its full CAP allocations to use for water service to customers, Arizona Water plans to construct its Pinal Valley Recharge and Recovery Facility in the eastern part of its Pinal Valley service area. A map showing the location of the Pinal Valley Recharge and Recovery Facility is included as Figure 2-1, and a conceptual plan showing the recharge basins and connection to the CAP aqueduct is shown in Figure 2-2.

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[3] *See* A.R.S. §45-801.01 1-2

[4] Arizona Department of Water Resources, *Draft Demand and Supply Assessment, 1985 – 2025 Pinal Active Management Area*, 7.

Figure 2-1 Pinal Valley Service Area and Pinal Valley Recharge and Recovery Facility Location

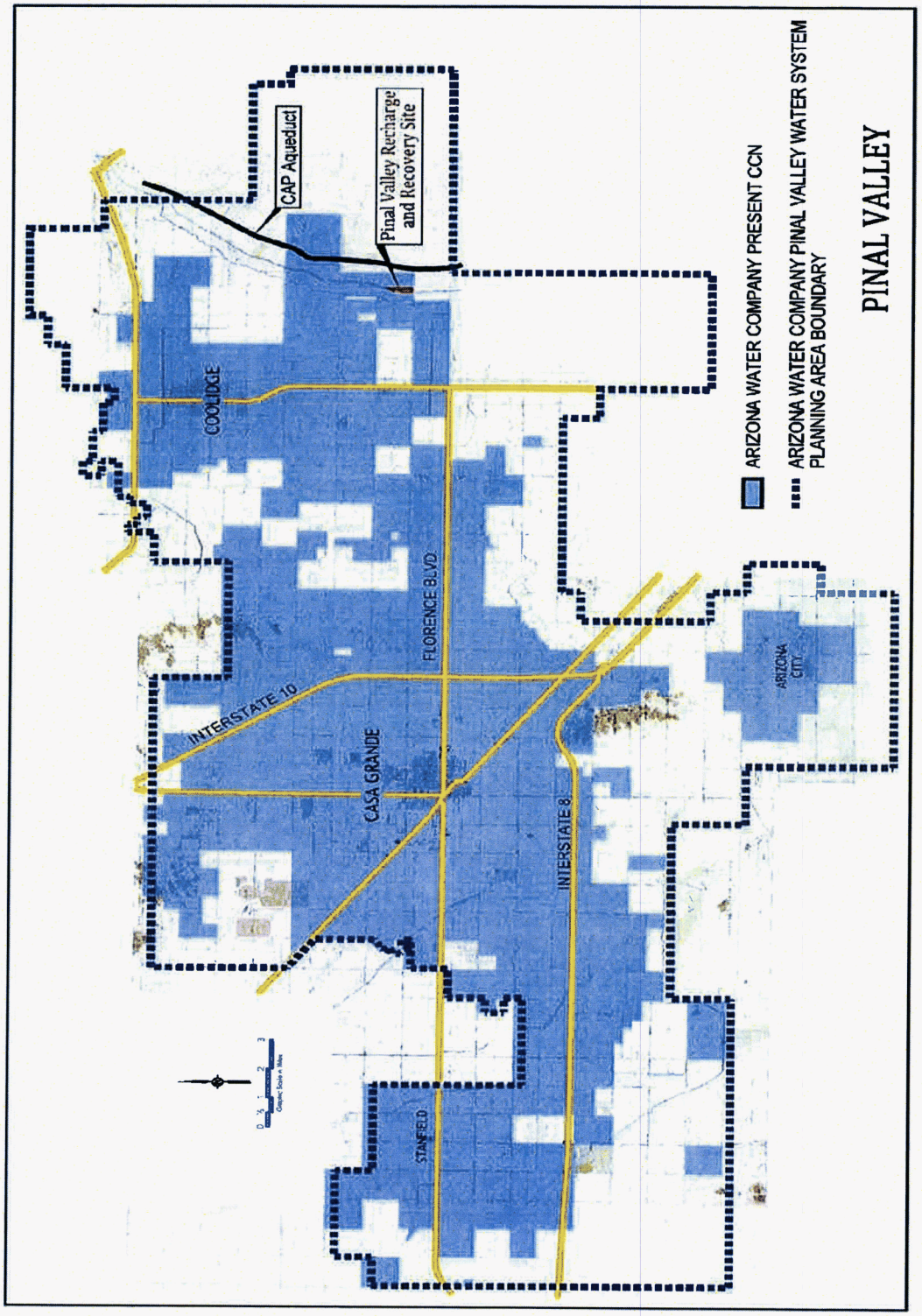
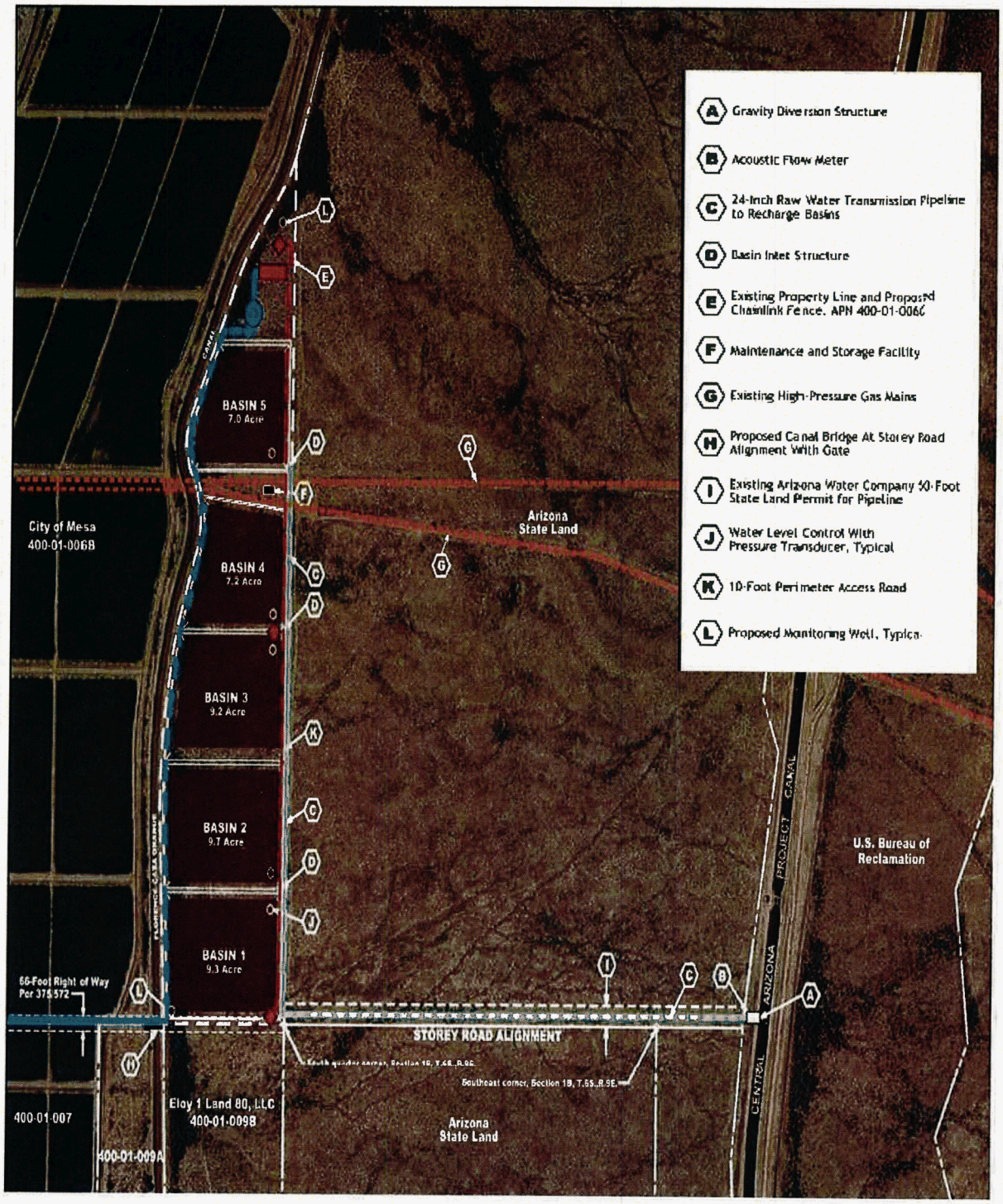


Figure 2-2 Pinal Valley Recharge and Recovery Facility Conceptual Plan



A hydrogeologic study completed for Arizona Water shows that its recharge and recovery site is capable of recharging CAP water at a rate of one foot per day through the use of the planned spreading basins.[5] Based on this recharge rate, the hydrogeologic study estimates that the facility will be capable of recharging Arizona Water's full 10,884 acre-feet CAP allocation with 30 acres of recharge basins.

For purposes of this 2015 CAP Use Plan, Arizona Water has used 12,000 acre-feet per year as the full build out capacity of this facility to account for 2-3 months when each recharge basin is not used because of necessary maintenance. Regular maintenance of the Pinal Valley Recharge and Recovery Facility includes sediment removal and scarification (i.e., tilling the basin surface to prevent clogging), repair and adjustment of monitoring wells, and calibration and repair of water meters and other appurtenances.

Untreated CAP water will flow by gravity from a turnout or siphon constructed at the CAP aqueduct to the Pinal Valley Recharge and Recovery Facility through 3,000 lineal feet of 24-inch water transmission main. ADWR requires two monitoring wells near the recharge basins as part of the required water storage permit to measure the level of groundwater mounding caused by percolating CAP water. Due to the high quality of CAP water, Arizona Water will not need to treat the water prior to recharge in the Pinal Valley Recharge and Recovery Facility spreading basins. A detailed description of the Pinal Valley Recharge and Recovery Facility is included in the hydrogeologic study attached hereto as Appendix A-2.

2.3. Recovery of Stored CAP Water

Arizona Water will initially recover stored CAP water from any of its 39 existing wells located throughout its Pinal Valley service area pursuant to recovery well permits issued by ADWR. As the area near the Pinal Valley Recharge and Recovery Facility develops, Arizona Water will recover stored CAP water from recovery wells constructed at the recharge site and deliver it to the Pinal Valley service area distribution system through a 36-inch water transmission main. Arizona Water will construct on-site recovery wells as needed to satisfy water system production needs and to meet its needs for recovery of stored CAP water as shown in Figure 2-3 below.

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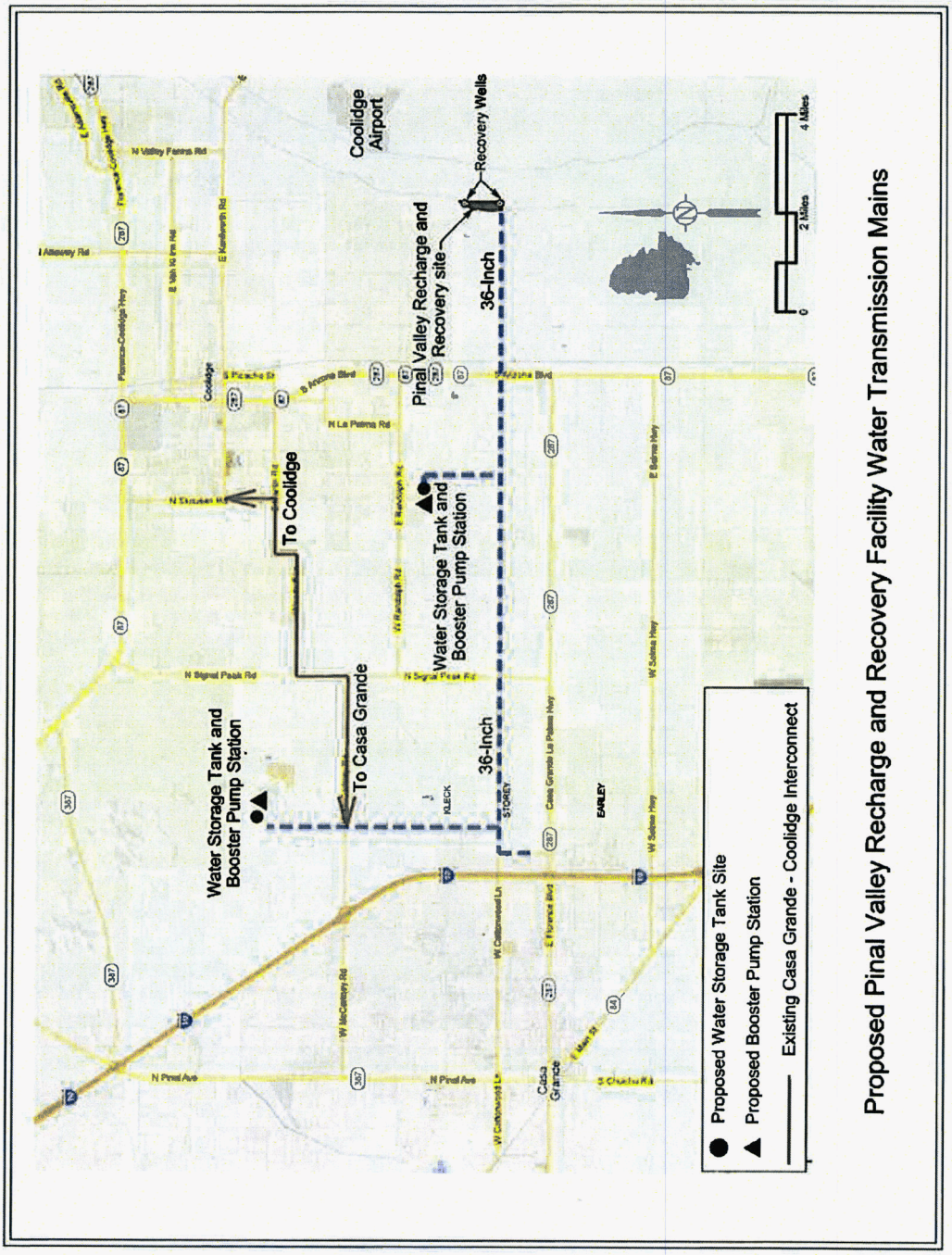
[5] *See* Appendix A-2 Hydrogeologic Study Arizona Water Company, December 18, 2014, Page 9

Figure 2-3 Pinal Valley Recharge and Recovery Facility Water Transmission Mains and Onsite Recovery Wells



2.4. Pinal Valley Recharge and Recovery Facility – Cost Estimate

Arizona Water obtained an Engineer's Opinion of Probable Construction Cost for each phase of this facility (Appendix A-3), which shows a cost of $5.8 million for the Pinal Valley Recharge and Recovery Facility at full build out.[6] The estimate includes costs to construct 3,000 lineal feet of 24-inch water transmission main and related infrastructure required to deliver water from the CAP aqueduct to the Pinal Valley Recharge and Recovery Facility's recharge basins. A schedule showing both the cost and recharge capacity for each phase is shown in Table 2-1 below.

Table 2-1 Pinal Valley Recharge and Recovery Facility Cost Estimate by Phase

Basin Number Or Phase	Year	Basin Area (Acres)	Basin (Facility) Recharge Capacity (AF per year)		Construction Cost
1	2016	9.3	2,650	(2,650)	$2,743,000
2	2017	9.7	2,750	(5,400)	$731,000
3	2018	9.2	2,600	(8,000)	$747,000
4	2019	7.2	2,000	(10,000)	$763,000
5	2020	7.0	2,000	(12,000)	$779,000
Total					$5,763,000

Note 1: Facility Recharge Capacity reflects 2-3 months when recharge basins are not used because of necessary maintenance.
Note 2: Additional CAP water, recycled water or other renewable supplies may be available for recharge at this facility.

The Engineer's Opinion of Probable Operations and Maintenance ("O&M") costs for the Pinal Valley Recharge and Recovery Facility is $64,180 per year at full build out.[7] The O&M cost estimate for Phase One of the Pinal Valley Recharge and Recovery Facility is based on the assumption that the first recharge basin will be placed into service in late 2016. Arizona Water will further develop and refine these O&M cost estimates as it gains experience operating and maintaining Phase One of the Pinal Valley Recharge and Recovery Facility, and from conducting a pilot recharge program in 2015.

Arizona Water plans to fund the construction of the Pinal Valley Recharge and Recovery Facility primarily with off-site facilities fees. Also, Arizona Water will seek federal and state grants, and if necessary, will use company funds. Arizona Water plans to construct the Pinal Valley Recharge and Recovery Facility in phases to match construction costs with collection of off-site facilities fees and awards of federal and state grants. Arizona Water projects that by 2016 it will collect off-site facilities fees sufficient to construct Phase One of the Pinal Valley Recharge and Recovery Facility, estimated to cost $2.7 million. Arizona Water expects to construct all phases of the Pinal Valley Recharge and Recovery Facility by 2020. Table 2-2 shows the phasing of the Pinal Valley Recharge and Recovery Facility and the projected amount of off-site facilities fees available to construct this facility.

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[6] *See* Appendix A-3 Engineer's Opinion of Probable Construction Cost, March 20, 2015
[7] *See* Appendix A-4 Details of the Opinion of Probable Operations and Maintenance Costs

Table 2-2 Pinal Valley Recharge and Recovery Facility Construction Cost and Projected Off-Site Facilities Fees

Phase	Year	Recharge and Recovery Facility Construction Cost	Projected Off-Site Facilities Fees Available*
One	2016	$2,743,000	$2,360,000
Two	2017	$731,000	$728,000
Three	2018	$747,000	$760,000
Four	2019	$763,000	$791,000
Five	2020	$779,000	$823,000
Total		$5,763,000	$5,462,000

*Projected Off-Site Facilities Fees. Federal or state grants that are received would reduce the need to apply offsite facilities fees or company funds.

2.5. Pinal Valley Recharge and Recovery Facility Feasibility and Customer Savings

Arizona Water analyzed the effect on Pinal Valley customers' water rates by comparing the cost of constructing and operating the Pinal Valley Recharge and Recovery Facility to the cost of constructing and operating a surface water treatment plant, as originally planned in the 2006 CAP Use Plan. Table 2-3 below shows the cost savings achieved by constructing, operating and maintaining the Pinal Valley Recharge and Recovery Facility instead of the costly and labor-intensive surface water treatment plant.[8]

Table 2-3 Cost Savings Associated with Pinal Valley Recharge and Recovery Facility

Category	**Surface Water Treatment Plant**	**Recharge and Recovery Facility**	***SAVINGS***
Construction Cost	$94.3 million	$5.8 million*	**$88.5 million**
Annual Operating and Maintenance Costs	$4.5 million	$2.1 million	**$2.4 million**
Annual Overall Revenue Requirement	$19.6 million	$2.1 million	**$17.5 million**
Monthly Customer Cost	$27.13	$2.87	**$24.26 or 89%**

* This amount is paid by offsite facilities fees and would not be in rate base.

As Table 2-3 shows, delivering CAP water to customers through recharge and recovery at Arizona Water's Pinal Valley Recharge and Recovery Facility will save customers $17.5 million per year compared to constructing, operating, and maintaining a costly surface water treatment plant. As a result, the average residential customer will save $24.26 per month, or 89%, compared to a surface water treatment plant. As a result, Arizona Water's plan to use CAP water through recharge and recovery at the Pinal Valley Recharge and Recovery Facility is the most cost-effective, practical and thus feasible option.

[8] *See* Appendix A-5 for cost details.

Beyond the cost savings for the average residential customer, another reason to construct the Pinal Valley Recharge and Recovery Facility instead of a costly surface water treatment plant is the limited availability of contributed capital through offsite facilities fees. Given the low level of customer growth in the Pinal Valley service area over the past eight years and the corresponding low amount of offsite facilities fees, Arizona Water would need to raise approximately $90 million of investment capital (i.e. equity or debt) to pay for a costly surface water treatment plant. To put that $90 million of plant investment into perspective, constructing a costly surface water treatment plant would increase Arizona Water's Pinal Valley water system rate base by nearly 145%. On the other hand, Arizona Water expects to be able to fund most, if not all of the entire cost of the Pinal Valley Recharge and Recovery Facility with offsite facilities fees and federal and state grants, which are recorded as contributions in aid of construction and excluded from rate base, thereby keeping customer rates low.

Given the cost savings and the feasibility of the Pinal Valley Recharge and Recovery Facility, constructing a costly surface water treatment plant is neither feasible nor prudent now or in the foreseeable future.

2.6. Interim Plan to Recharge and Recover CAP Water

Prior to completing construction of the Pinal Valley Recharge and Recovery Facility, Arizona Water plans to store and recover CAP water for delivery to customers on an interim basis starting in 2015 by storing CAP water at groundwater savings facilities. To this end, Arizona Water has been able to negotiate short-term contracts with the Central Arizona Irrigation and Drainage District, the Maricopa-Stanfield Irrigation and Drainage District and the Hohokam Irrigation and Drainage District, to store CAP water in groundwater savings facilities owned and operated by these entities.

Under this interim approach, Arizona Water will schedule delivery of CAP water to these irrigation districts in lieu of their pumping groundwater. Under the terms of Arizona Water's water storage permit, every acre-foot of water delivered to the irrigation districts for use in lieu of pumping groundwater generates an acre-foot of CAP water storage credit. Arizona Water can then recover an equivalent amount of stored CAP water from its recovery wells and directly deliver recovered CAP water to its Pinal Valley customers.

Under the groundwater savings facilities contracts, Central Arizona Irrigation and Drainage District, Maricopa-Stanfield Irrigation and Drainage District and Hohokam Irrigation and Drainage District will pay $36 per acre-foot to help offset Arizona Water's cost to purchase CAP water for groundwater storage. These offsets reduce the net cost of CAP water to Arizona Water and its customers.

Additionally, in 2015, Arizona Water applied for and received $357,500 in grant funding from ADWR's Water Management Assistance Program for the purpose of increasing the amount of CAP water stored in calendar year 2015. As shown in Table 2-4, both the groundwater savings facilities offsets and the ADWR grant greatly reduce the cost of CAP water to Arizona Water and its customers.

In 2015, Arizona Water will store 2,500 acre-feet of CAP water at Maricopa-Stanfield Irrigation and Drainage District's groundwater savings facilities, and 2,500 acre-feet at Central Arizona Irrigation and Drainage District's groundwater savings facilities. Arizona Water

plans to increase the amount of CAP water stored at groundwater savings facilities by 1,000 acre-feet each year until its full allocation is delivered to the company's customers from the recharge and recovery facility or through direct deliveries for non-potable use. As each phase of the Pinal Valley Recharge and Recovery Facility is completed, Arizona Water will shift deliveries of CAP water to that facility from the interim groundwater savings facilities.

Table 2-4 below shows the projected schedule and net cost of CAP deliveries to the groundwater savings facilities and the Pinal Valley Recharge and Recovery Facility by year:

Table 2-4 CAP Water Deliveries and Cost to Recharge CAP Water

Year	Pinal Valley Recharge and Recovery Facility (AF)	Groundwater Savings Facility Recharge (AF)	Cost of CAP Water ($/AF)	Groundwater Savings Facility Offset ($/AF)	ADWR Grant ($)	Total Recharge and Recovery Facility Cost ($)	Total Groundwater Savings Facility Cost ($)	Annual Recharge Cost ($)
2015	0	5,000	$157	$36	$357,500	$0	$247,500	$247,500
2016*	0	6,000	$161	$36	TBD	$0	$750,000	$750,000
2017	2,650	4,350	$166	$36	TBD	$439,900	$565,500	$1,005,400
2018	5,400	2,600	$171	$36	TBD	$923,400	$351,000	$1,274,400
2019	8,000	956	$174	$36	TBD	$1,392,000	$131,928	$1,523,928
2020**	8,956	0	$196	N/A	TBD	$1,755,376	N/A	$1,755,376

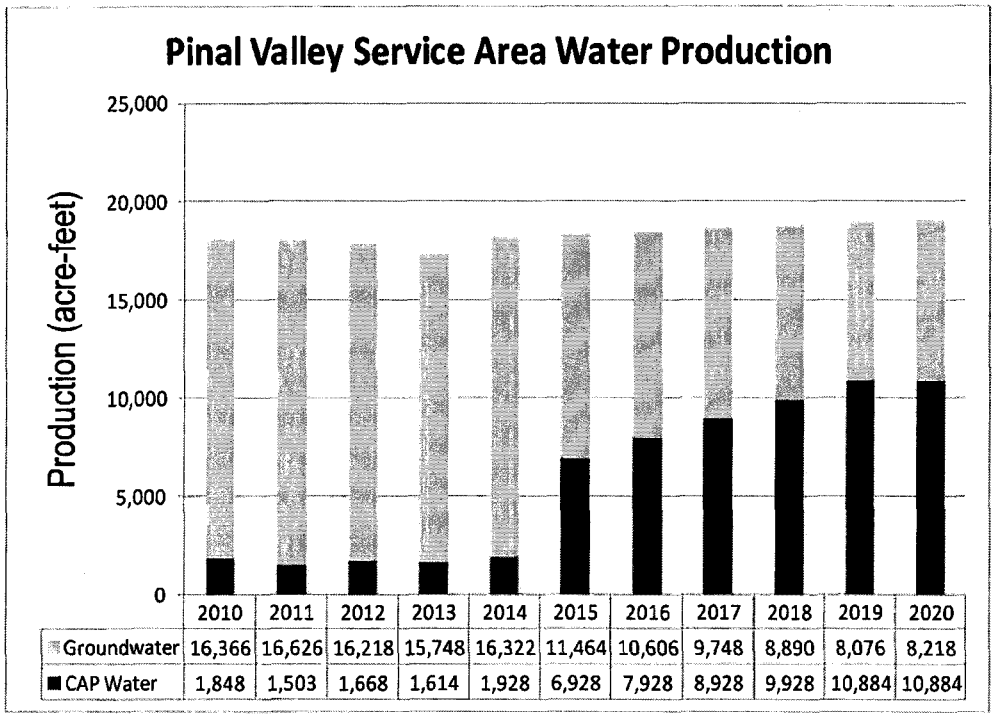
*Note 1: CAP water ordered for 2017 at the Pinal Valley Recharge and Recovery Facility after first recharge basin is completed.

**Note 2: 8,956 AF Based on present CAP allocation (10,884 AF - 1,928 AF) and 1,928 AF delivered directly to non-potable users.

2.7. Future Water Supplies Under this 2015 CAP Use Plan

Arizona Water's total 2014 water production in its Pinal Valley service area, including Tierra Grande and Stanfield, was 18,214 acre-feet, with pumped groundwater making up nearly 90% of all water production. Implementing this 2015 CAP Use Plan will significantly increase the amount of CAP water recharged and recovered as shown in Figure 2-4, below.

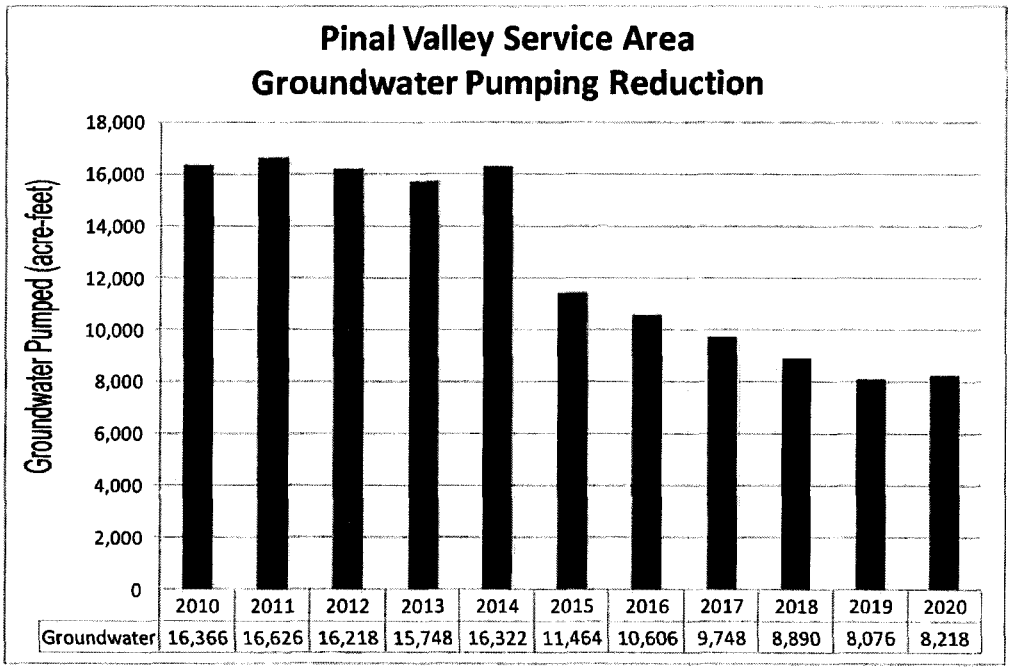
Figure 2-4 Pinal Valley Service Area Water Production



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Groundwater	16,366	16,626	16,218	15,748	16,322	11,464	10,606	9,748	8,890	8,076	8,218
CAP Water	1,848	1,503	1,668	1,614	1,928	6,928	7,928	8,928	9,928	10,884	10,884

Under this 2015 CAP Use Plan, Arizona Water will reduce groundwater pumping from 2014 levels by over 50% or 8,000 acre-feet by 2019, as shown in Figure 2-5. Over the next ten years, Arizona Water will recharge an average of 8,000 acre-feet of CAP water per year and will have saved nearly 80,000 acre-feet of groundwater.

Figure 2-5 Pinal Valley Service Area Groundwater Pumping Reduction



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Groundwater	16,366	16,626	16,218	15,748	16,322	11,464	10,606	9,748	8,890	8,076	8,218

3. State and Regional Water Policies Require Arizona Water to Effectively Use its CAP Water Supplies

3.1. Arizona's Need to Address Water Supply Sustainability

Arizona has a long history of successfully addressing the state's need for sustainable, renewable, and effectively managed water supplies, while meeting water users' needs. Since Arizona Water completed its 2006 CAP Use Plan, the State of Arizona, as well as a number of federal agencies, have completed studies, reports, assessments and plans documenting current and future water resource planning needs in Arizona and in other states that rely on Colorado River water. Four of these key documents that Arizona Water relied upon and references in this 2015 CAP Use Plan are:

- *Draft Demand and Supply Assessment 1985-2025: Pinal Active Management Area*, May 2011 – This assessment was prepared by ADWR as background for development of the Fourth Management (Conservation) Plan for the Pinal AMA. ***ADWR's assessment concludes that groundwater pumping will likely increase in the Pinal AMA through 2025.***

- *U.S. Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study: Study Report*, 2012 – This study, prepared by the Bureau of Reclamation, represents the most comprehensive analysis ever undertaken within the Colorado River Basin. ***This study concludes that there is an increased likelihood of future shortages of Colorado River water, having the greatest impact on agricultural users and affecting other CAP users as well.***

- *Arizona's Next Century: A Strategic Vision for Water Supply Sustainability*, January 2014 - This report was prepared by ADWR as a next step to identify possible strategies to address identified water supply and demand imbalances. ***ADWR's study concludes that an appropriate water management strategy needs to include underground storage and recovery of CAP water and reclaimed water.***

- *Recovery of Water Stored by the Arizona Water Banking Authority*, April 2014 – This plan is a collaborative effort among the AWBA, ADWR, CAP and stakeholders to provide a roadmap for recovering CAP water stored in each of the AMAs by the AWBA. ***This plan recommends that entities in the Pinal AMA pursue the construction of underground storage facilities to store CAP water.***

As summarized above, these studies, reports, assessments, and plans conducted by state and federal agencies demonstrate the urgent need to address issues ranging from an increase in groundwater pumping to shortages of Colorado River water. The state agencies charged with addressing these challenges, ADWR, CAP and AWBA, agree that maximizing recharge of available CAP water for underground storage and recovery must play an integral role in assuring

that Arizona's water users have long-term reliable, renewable, and sustainable sources of supply, even as flows and availability of water from the Colorado River become less predictable.

3.2. The Groundwater Management Act

Prior to 1980, groundwater pumping in Arizona was largely unregulated which led to groundwater overdraft. In response, Arizona adopted one of the most comprehensive groundwater management programs in the United States – the 1980 Groundwater Management Act.[9] In order to facilitate management of groundwater supplies in areas where historical groundwater overdraft had been particularly severe, the Groundwater Management Act designated AMAs within certain high growth and water use areas in the state. Arizona Water's Pinal Valley service area is located in the Pinal AMA. The management plans for the AMAs, including the Pinal AMA, are administered by ADWR and require municipal water providers, like Arizona Water, to progressively reduce their reliance on groundwater through the use of renewable water supplies like CAP water, recycled water, or through member land or service area enrollment in the Central Arizona Groundwater Replenishment District.[10] [11]

The Pinal AMA, shown in Figure 3-1, covers approximately 4,000 square miles in the south-central portion of Arizona. The management goal for the Pinal AMA is to (1) allow development of non-irrigation water uses, (2) extend the life of the agricultural economy as long as feasible, and (3) preserve water supplies for future non-irrigation uses.[12]

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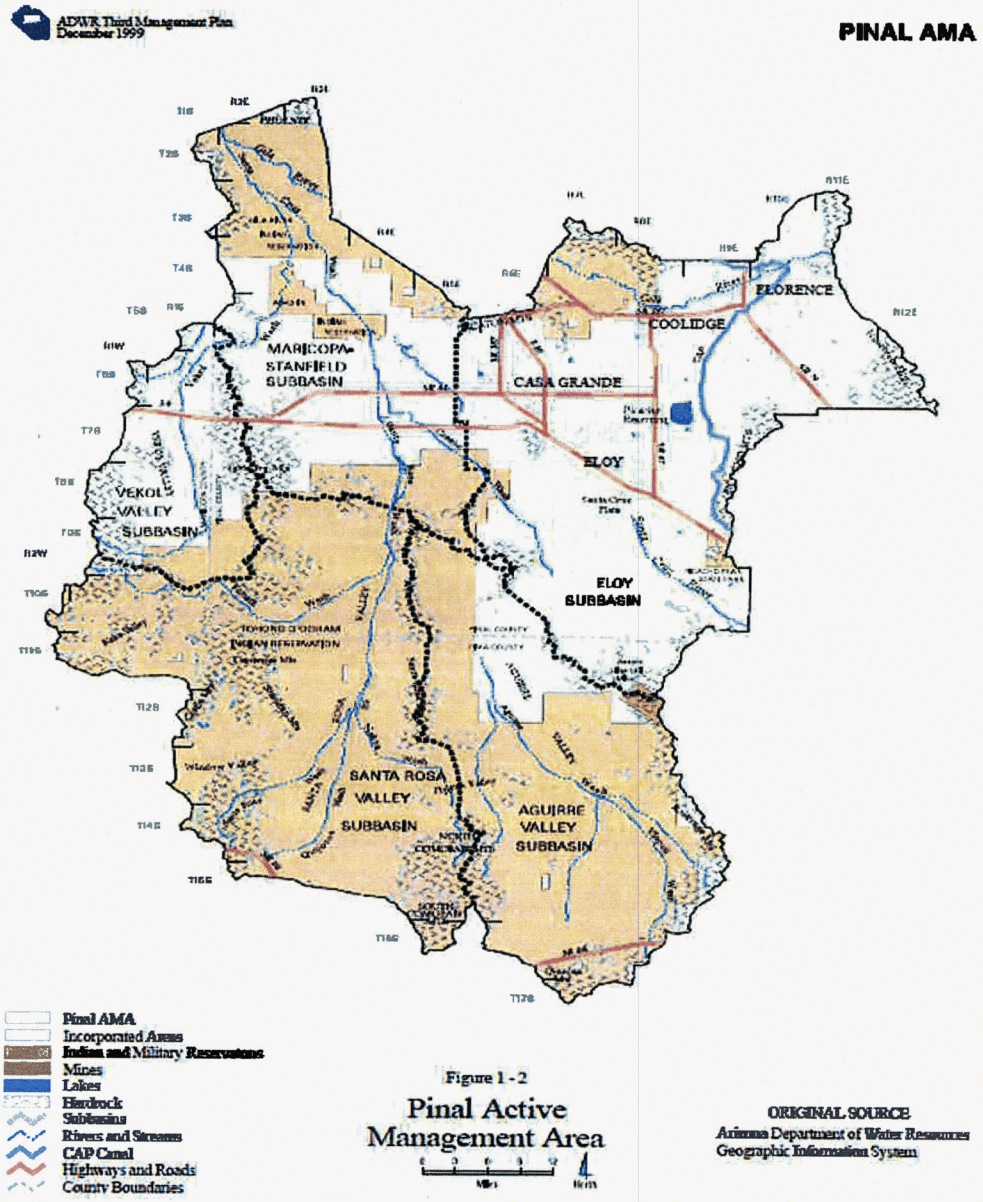
[9] *See* A.R.S. §45-401 through §45-704

[10] *See* A.R.S. §45-801.01 1-2 requiring the use of renewable supplies, such as Colorado River water

[11] The Central Arizona Groundwater Replenishment District is the name used to describe the groundwater replenishment authority operated by the Central Arizona Water Conservation District the entity charged with operating and maintaining the CAP aqueduct throughout its three-county service area.

[12] Arizona Department of Water Resources, *Third Management Plan for Pinal Active Management Area*, 1999, Phoenix, 1-2.

Figure 3-1 Pinal AMA



As discussed in Section 2.7 and shown in Figures 2-2 and 2-3 Arizona Water will reduce groundwater pumping by 5,000 acre-feet in 2015, with corresponding increases in recovery of stored CAP water, followed by annual increases of 1,000 acre-feet of CAP recharge each year thereafter until its full CAP water allocations of 10,884 acre-feet are put to beneficial use, further reducing the need to pump groundwater. As a result, Arizona Water's water supply management strategy complies with the State of Arizona's public policy that requires greater use of renewable supplies such as CAP water. Arizona Water's 2015 CAP Use Plan also helps to achieve the Pinal AMA's management goal of preserving available groundwater supplies for future non-irrigation uses.

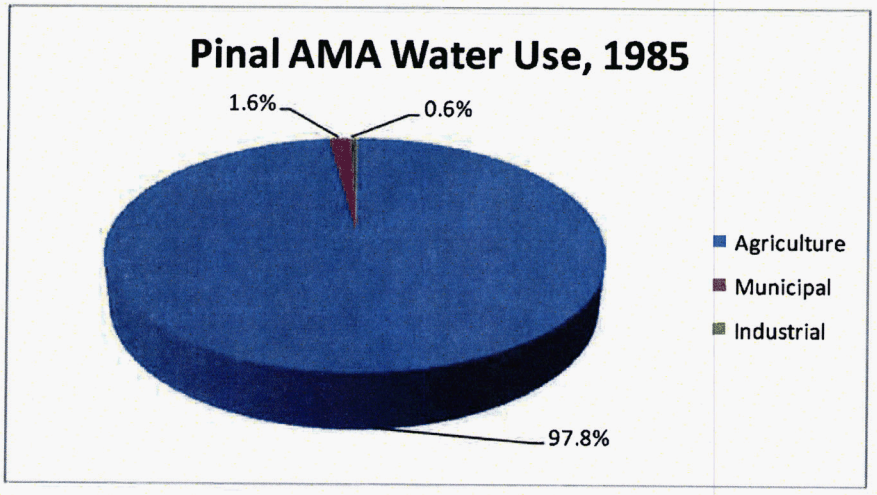
3.3. Water Use in the Pinal AMA

In the Pinal AMA, water is used primarily to meet municipal, industrial, agricultural and Indian demands. Beneficial uses of water, as defined by ADWR, are summarized as follows:

- Municipal water use, which includes water delivered for non-irrigation uses by a city, town, private water company or irrigation district.
- Industrial water use, which includes non-irrigation uses of water not supplied by a city, town, or private water company. Industrial use includes uses by animal industries, mines and power plants.
- Agricultural water use is water for agricultural uses (growing of crops) not located on Indian Reservations.
- Indian water use is either municipal or agricultural water used on Indian Reservations.

In 1985, total water use in the Pinal AMA was 865,024 acre-feet. At that time, non-Indian and Indian agricultural use accounted for 97.8 percent of total water use in the Pinal AMA, while municipal and industrial use collectively accounted for 2.2 percent (1.6 percent for municipal and 0.6 percent for industrial) (*See* Figure 3-2).[13]

Figure 3-2 Pinal AMA Water Use 1985



As shown in Table 3-1 below, total water use in the Pinal AMA increased by nearly 19 percent, from 865,024 acre-feet in 1985 to 1,029,230 acre-feet in 2006.[14] Municipal water use increased from 13,607 acre-feet to 32,968 acre-feet and industrial water use increased from 4,995 acre-feet to 20,243 acre-feet during this same time period, collectively accounting for

[13]ADWR's *Draft Demand and Supply Assessment 1985-2025 Pinal Active Management Area*, 42.
[14]Ibid.

5.2 percent of total water use in the Pinal AMA in 2006. Non-Indian agricultural and Indian communities water use increased from 846,422 acre-feet in 1985 to 976,019 acre-feet in 2006, accounting for 94.8 percent of total water use in the Pinal AMA in 2006.

Table 3-1 Water Used in Pinal AMA in 1985 and 2006 (in Acre Feet)

	1985		2006	
Non-Indian Agriculture Use	792,092		819,894	
Indian Communities Use	54,330		156,125	
Total Agriculture Use	846,422	97.8%	976,019	94.8%
Municipal Use	13,607	1.6%	32,968	3.2%
Industrial Use	4,995	0.6%	20,243	2.0%
Total Municipal and Industrial Use	18,602	2.2%	53,211	5.2%
Total Use	865,024	100.0%	1,029,230	100.0%

3.4. Future Water Uses in the Pinal AMA

ADWR's *Draft Demand and Supply Assessment 1985-2025 Pinal Active Management Area, May 2011* provides three water demand scenarios for the year 2025 for each category of water use in the Pinal AMA. In all demand scenarios, municipal and industrial water uses are expected to increase by 2025 as the Pinal AMA urbanizes and population increases. ADWR projects total agricultural use to remain flat or decline over the long-term.

As shown in Table 3-2, agriculture (Irrigation districts and Indian communities) represents the largest historical and projected use of water in the Pinal AMA.[15] Irrigation district water use is the total water used by four irrigation districts: Central Arizona Irrigation and Drainage District, Maricopa-Stanfield Irrigation and Drainage District, Hohokam Irrigation and Drainage District and the San Carlos Irrigation and Drainage District. The Gila River and Ak-Chin Indian Communities, located immediately north of Arizona Water's Pinal Valley service area, are the largest Indian agricultural users.

Table 3-2 Water Used in Pinal AMA (1985) and Projected Use (2025)

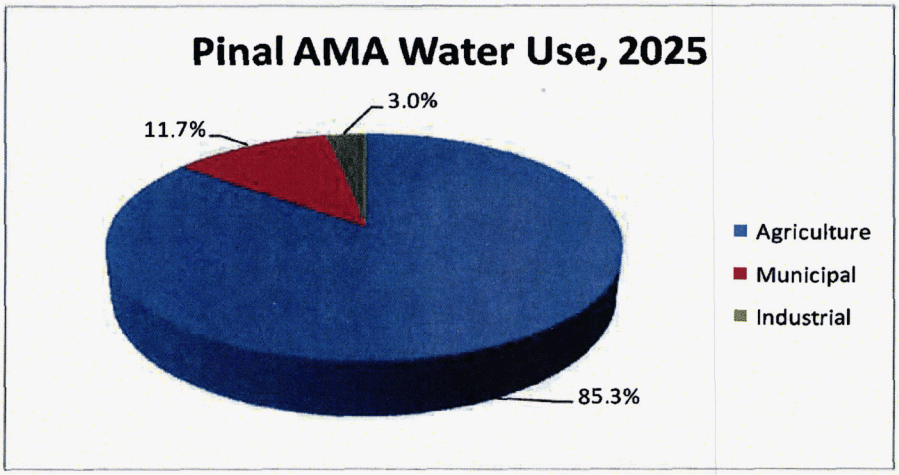
	Water Used (1985)	% of Total	Projected Use (2025)	% of Total
Irrigation Districts	792,092		689,180	
Indian Communities	54,330		194,616	
Total Agriculture	846,422	97.8	883,796	85.3
Municipal	13,607	1.6	121,175	11.7
Industrial	4,995	0.6	31,042	3.0
Total AF	865,024	100.0	1,036,013	100.0

In all three water demand scenarios, agricultural use (Irrigation districts and Indian communities) will continue to make up the majority of water use in the Pinal AMA in 2025, although declining slightly to 85.3 percent of total water use (See Figure 3-3). ADWR

[15] Ibid

projects municipal water use to increase to 11.7 percent of total water use with industrial water use accounting for 3 percent of total water use.

Figure 3-3 Pinal AMA Water Use - Projected 2025



3.5. Available Water Supplies in the Pinal AMA

Prior to the availability of CAP water in 1987, groundwater made up 74 percent of water supplies and the Gila River made up 26 percent of water supplies in the Pinal AMA.[16] [17]

The makeup of water supplies in the Pinal AMA began to change in 1987 after CAP made its first deliveries of Colorado River water to the Pinal AMA from the CAP aqueduct. In the Pinal AMA, CAP water is delivered directly for agricultural purposes or is delivered to agricultural irrigation districts in lieu of pumping groundwater through groundwater savings facilities. Lesser amounts of untreated CAP water are delivered for municipal and industrial water uses. Similar to this 2015 CAP Use Plan, the Pinal County Water Augmentation Authority stored CAP water at groundwater savings facilities owned and operated by Central Arizona Irrigation and Drainage District and Maricopa-Stanfield Irrigation and Drainage District on behalf of the Town of Florence and the City of Eloy, two Pinal AMA municipal providers with CAP allocations. As of December 31, 2014, there was only one small surface water treatment plant in the Pinal AMA located at the Ak-Chin Indian Community.

Deliveries of CAP water to the Pinal AMA in 1987 dramatically reduced reliance on mined native groundwater. Over the ten-year period from 2000 to 2009, groundwater made up 46 percent of water supplies, CAP water made up 46 percent of water supplies, and Gila River water made up the balance of water supplies (See Figure 3-4). [18] [19] Use of groundwater declined from 1985 to 2009 despite the fact that overall water use increased by 30 percent during

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[16] Reclaimed water and CAGRD Replenishment are used in the Pinal AMA but represent only about 0.3 percent of supply.

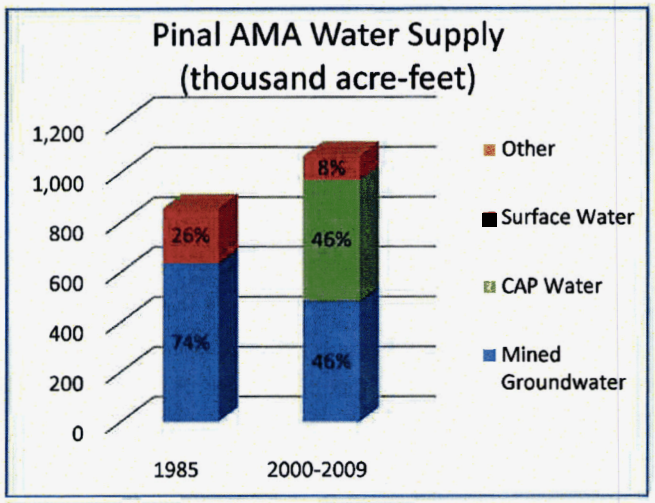
[17] ADWR's *Draft Demand and Supply Assessment 1985-2025 Pinal Active Management Area*, 42.

[18] Includes CAP water used directly and CAP water used in lieu of pumping groundwater.

[19] ADWR, *Pinal AMA Summary Budget*.

this same time period. This is particularly notable since water supplies from the Gila River were significantly reduced during this same time period because of the ongoing drought. As illustrated in Figure 3-4, CAP water supplies significantly reduced the use of mined groundwater. Over the ten-year period from 2000 to 2009, mining of groundwater decreased by an average of over 150,000 acre-feet annually, a decrease of 31 percent from 1985.

Figure 3-4 Pinal AMA Water Supply



3.6. The Future of CAP Water Supplies in the Pinal AMA

As of 2012, approximately 40 million people in seven western states relied on the Colorado River for water supplies.[20] Despite recently experiencing the worst 14-year drought in the last century, to date there has not been a declared shortage on the Colorado River that has affected CAP water deliveries to Arizona.[21] However, as of February 2015, Lake Mead is at approximately 41 percent of capacity.[22] Water levels at Lake Mead are important because the Bureau of Reclamation uses these water levels to determine whether to declare a shortage in supply and to what degree.

Declared shortages by the Bureau of Reclamation can reduce Colorado River water deliveries to the CAP depending on the severity of the declared shortage. For example, the Bureau of Reclamation has three tiers of shortage, Tier 1, Tier 2 and Tier 3, which have a specific effect on Arizona's water supplies from the Colorado River through the CAP. Water users in Arizona who rely on deliveries from the CAP aqueduct incur the majority of any restrictions or reductions in deliveries caused by declared shortages. Appendix A-6 provides greater detail of the process of reducing Colorado River water deliveries to CAP during declared shortages.

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[20]U.S. Department of the Interior, Bureau of Reclamation, *Colorado River Basin Water Supply and Demand Study: Study Report*, 2012, 2

[21] Ibid., 3

[22]U.S. Department of the Interior, Bureau of Reclamation, *Lower Colorado Water Supply Report*, http://www.usbr.gov/lc/region/g4000/weekly.pdf, accessed 2/10/2015.

If drought conditions persist, Arizona could soon face a reduction of nearly one third of its Colorado River water supply.[23] Longer-term drought conditions could cause more severe reductions to Arizona's CAP water supply. During Tier 1, Tier 2 and Tier 3 declared shortages, water users without a CAP subcontract or with CAP subcontracts with a lower priority than Arizona Water will have CAP water deliveries reduced or even eliminated depending on the severity of the shortage. Arizona Water's Municipal and Industrial ("M&I") priority subcontracts have a high priority and somewhat lesser risk of reduced deliveries except under shortages more severe than a Tier 3 shortage. Agricultural users are most affected by declared shortages since they do not have CAP subcontracts and receive Excess CAP water or non-Indian Agricultural priority CAP water, which have a lower priority than M&I priority CAP water.

In addition to the possibility of shortage and reduced deliveries of CAP water, CAP also plans to reduce deliveries to non-Indian agricultural users in the Pinal AMA by 75,000 acre-feet per year in 2017, with an additional 25 percent reduction in 2024. After 2030, CAP plans no deliveries to non-Indian agricultural users. As a result, non-Indian agricultural users will be forced to pump more groundwater to make up the shortfall caused by planned reductions in CAP water deliveries or any mandatory reductions because of declared shortages on the Colorado River.

3.7. The Future of Groundwater Supplies in the Pinal AMA

As of April 2015, the AWBA and the CAWCD had 1.7 million acre-feet of CAP water stored in the Pinal AMA through recharge at the Maricopa-Stanfield Irrigation and Drainage District, Central Arizona Irrigation and Drainage District and Hohokam Irrigation and Drainage District GSFs. In addition, as of April 27, 2015, ADWR reports that nearly 2.5 million acre feet of CAP water is stored at these groundwater savings facilities in the Pinal AMA for the following purposes:

- Assured water supplies
- Recovery during declared shortages
- Indian water Settlement purposes
- Southern Nevada's allocation of Colorado River water

Like Arizona Water, AWBA and CAWCD plan to recover stored CAP and Colorado River water for the above-listed purposes by using recovery wells. For example, AWBA's recovery plan projects the need to recover small volumes of water as early as 2017.[24] In order to prepare for this, AWBA encourages municipal and industrial subcontractors, such as Arizona Water to develop underground storage facilities in the Pinal AMA. Additionally, in late 2014 CAP started reaching out to CAP subcontractors, such as Arizona Water, to develop recovery strategy partnerships.[25] Arizona Water could also operate its recovery wells to recover CAP water stored by AWBA or CAWCD as part of this recovery strategy.

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[23] U.S. Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study, Study Report, December 2012, 6.

[24] Recovery of Water Stored by the AWBA, April 2014

[25] Ibid., 52

4. Conclusion

This 2015 CAP Use Plan identifies and explains how Arizona Water is implementing solutions to water supply uncertainties facing Arizona Water's Pinal Valley service area. According to the Bureau of Reclamation, the likelihood of declared shortages of Colorado River water means that CAP M&I subcontractors like Arizona Water face the risk of cutbacks and curtailments in CAP deliveries when declared shortages on the Colorado River reduce flows in the CAP aqueduct. At the same time, municipal and industrial water use will increase as development occurs in the Pinal AMA.

For these reasons, Arizona Water's 2015 CAP Use Plan carefully examined and analyzed:

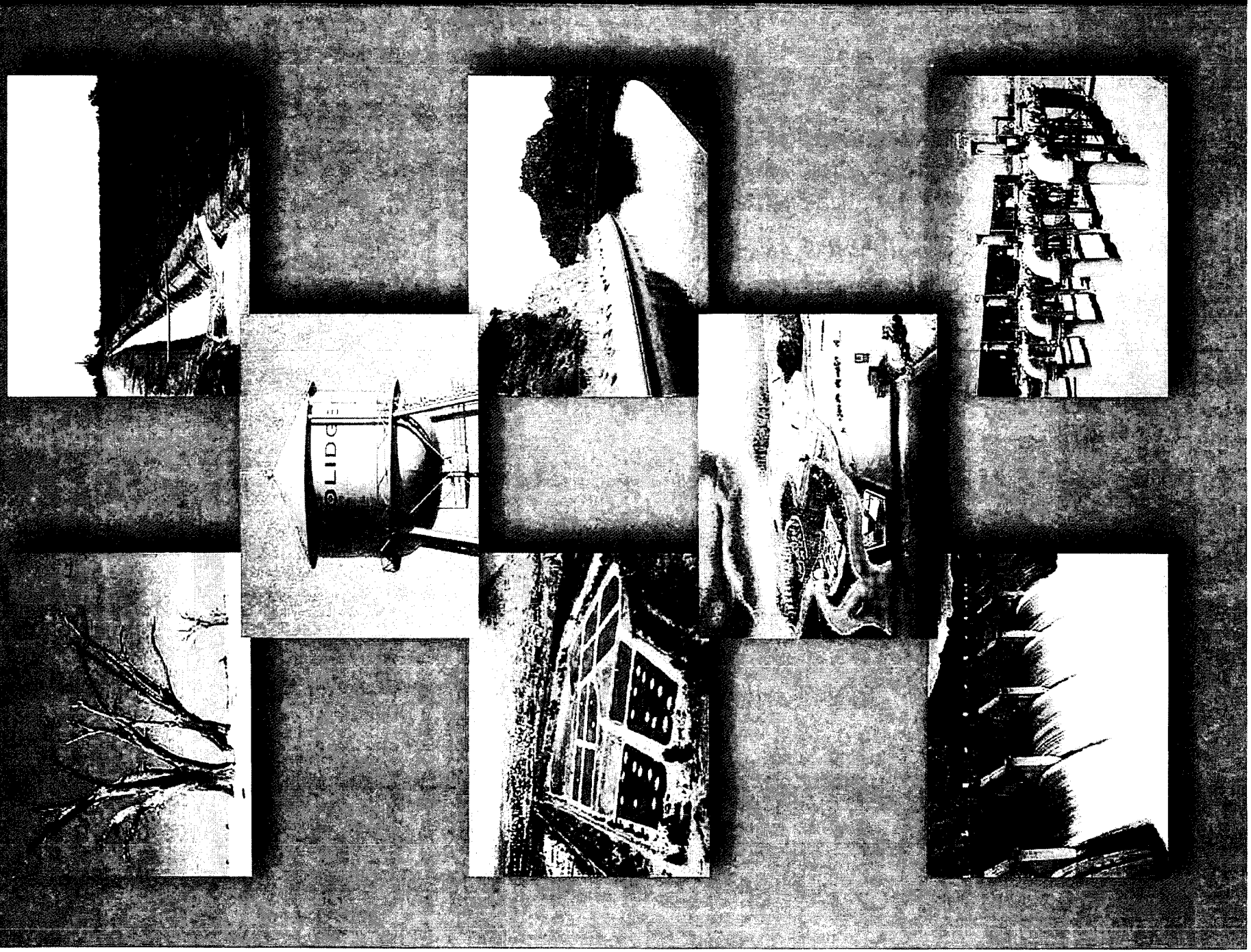
- Arizona's public policy of using renewable supplies like CAP water to meet water demands,
- Effects of drought and groundwater overdraft,
- Need to develop a sustainable, renewable, and reliable long-term supply of water,
- Need for a cost-effective and practical way to use CAP water through recharge and recovery facilities, and
- How to make full beneficial use of Arizona Water's CAP water and minimize the effect on customers' water rates.

As a result of that study, Arizona Water already has CAP water in underground storage in cooperation with local irrigation districts and is moving forward to design and construct the Pinal Valley Recharge and Recovery Facility with the following benefits:

- Implements Arizona's public policy of using renewable CAP water supplies to meet Pinal Valley customers' water needs,
- Recharges and recovers CAP water to help mitigate the effects of drought and groundwater overdraft,
- Achieves a renewable, sustainable and reliable long-term supply of water for Pinal Valley customers,
- Saves $88.5 million in construction costs and $2.4 million in annual operating and maintenance costs compared to the cost of designing, constructing, operating and maintaining a costly and labor intensive surface water treatment plant, and
- Saves the average residential customer $24.26 per month or 89% compared to the costly and labor intensive surface water treatment plant.

A-1 Water Resources Element of City of Coolidge 2025 General Plan

CHAPTER 7: WATER RESOURCES



Water Resources Element

INTRODUCTION

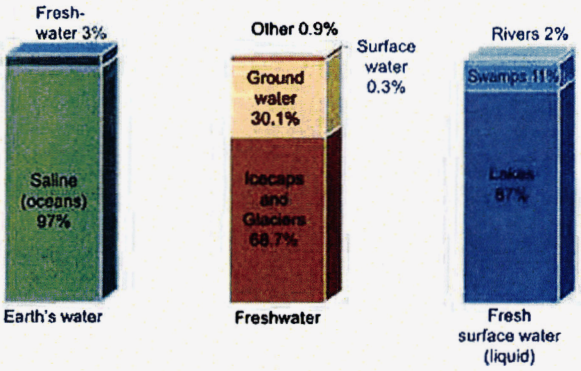
Arizona Water Company ("AWC") is a public service corporation regulated by the Arizona Corporation Commission ("ACC") which owns, operates and maintains the Pinal Valley water system which serves the City of Coolidge and the surrounding areas. AWC prepared the *Water Resources Plan* with AWC's historical information and projections as well as information provided by the City . The *Water Resources Plan* addresses the development and delivery of safe, reliable and adequate water supplies within the City's projected planning area through the year 2025.

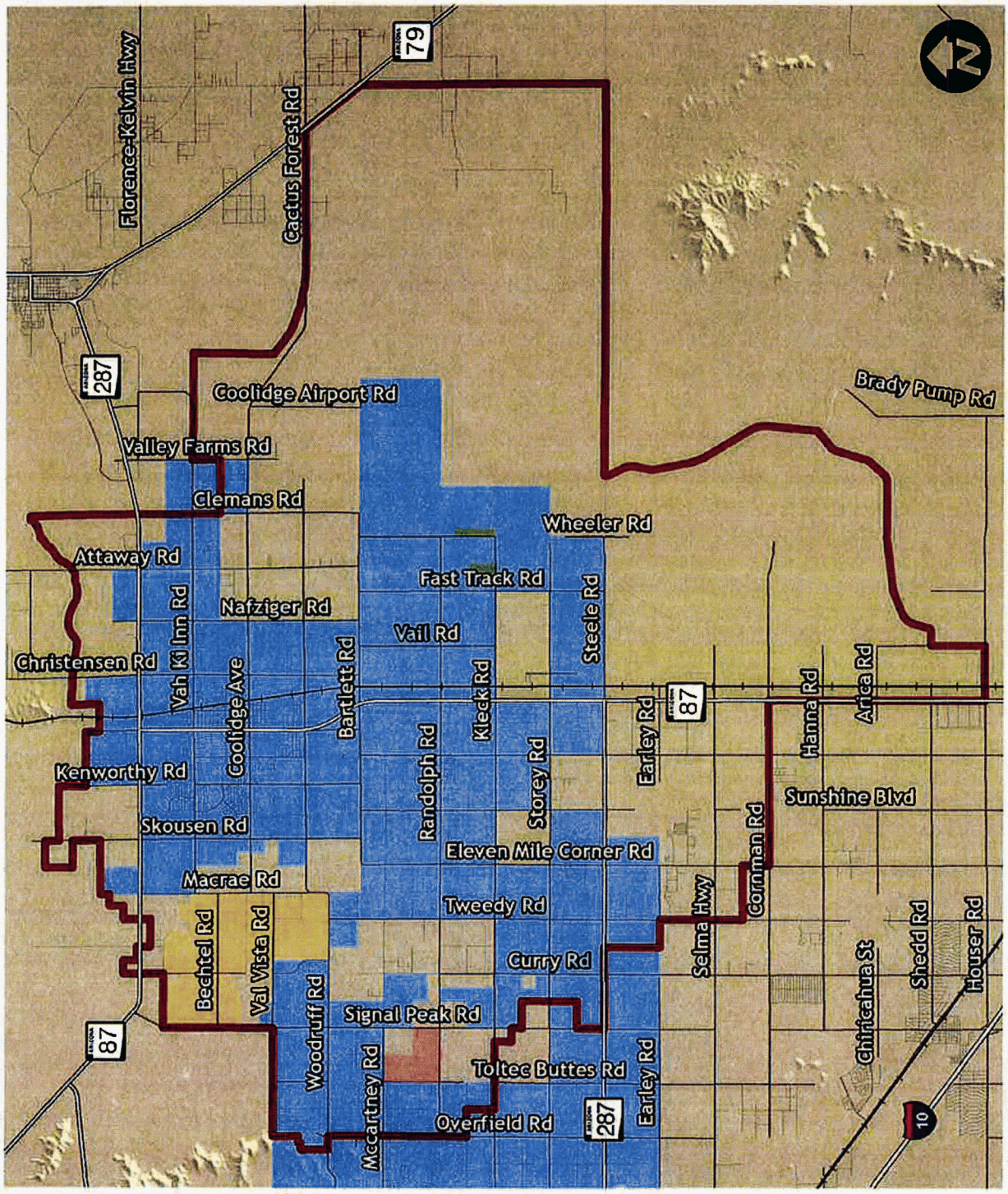
The *Water Resources Plan* focuses on issues that influence water availability, supplies and demands through the year 2025. Among the issues are current and future sources of supply, population growth rates and projections, projected water demands and conservation requirements. The *Water Resources Plan* focuses, in a large part, on areas within the City's projected planning area with the highest potential for growth.

BACKGROUND

There are four public service corporations (or water companies) that provide water service within the City's planning area boundary; Arizona Water Company, Carter Water Company, Signal Peak Water Company, and Woodruff Water Company. AWC provides potable water service to residential, commercial, and industrial users and is the largest potable water provider in the Coolidge area with a service area encompassing 68 square miles of the City's planning area. Woodruff Water Company has the second largest service area with approximately five square miles although it serves only a few customers. Signal Peak Water Company and Carter Water Company have the smallest service area with 0.71 and 0.21 square miles respectively. Figure 7.1 shows the ACC-authorized Certificates of Convenience and Necessity areas for water providers in the City's planning area.

Distribution of Earth's Water





WATER COMPANIES WITHIN THE CITY OF COOLIDGE PLANNING AREA BOUNDARY

Portion of Arizona Water Company	Woodruff Water Company	Signal Peak Water Company	Carter Water Company
68 Sq Mi (in PAB)	4.62 Sq Mi	0.71 Sq Mi	0.21 Sq Mi

Figure 7.1 : Certificate of Convenience and Necessity Areas

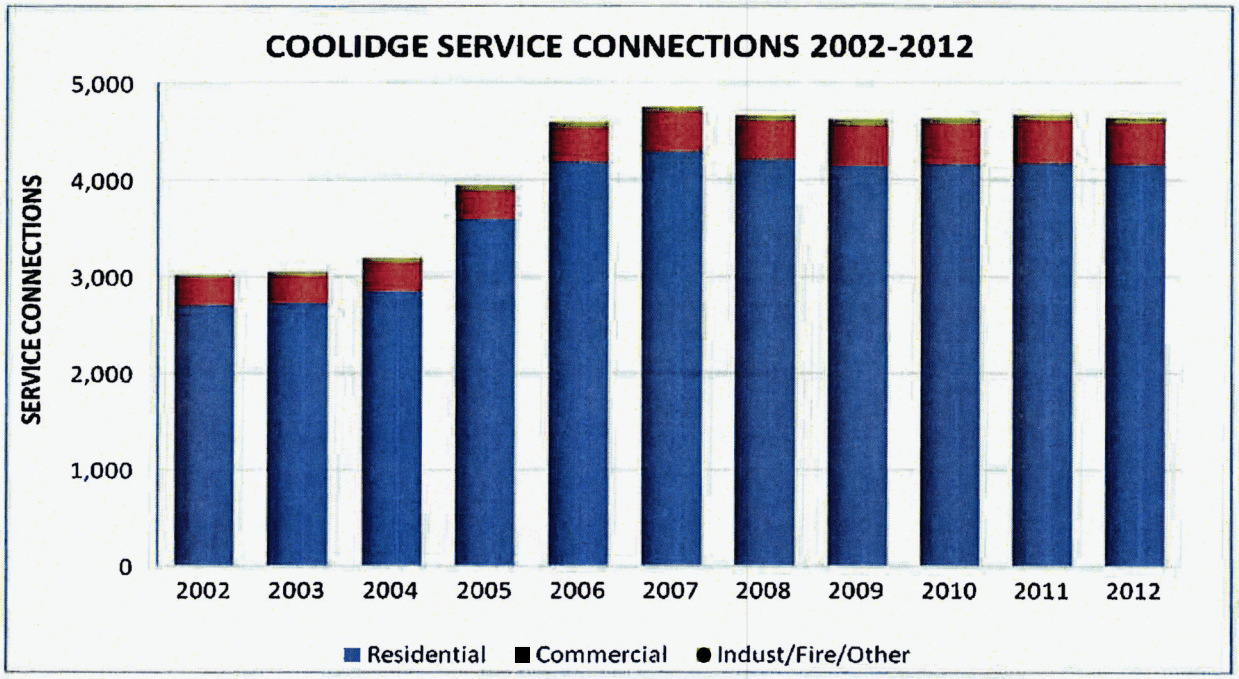
Water Resources Element

SERVICE CONNECTIONS

At the end of 2012, AWC's Pinal Valley water system provided water service to about 27,850 service connections of which more than 4,600 are in the City's planning area. 90% of the service connections are residential; 9% are commercial; the remaining 1% are either industrial, private fire service or other types of non-residential service.

In the past ten (10) years, AWC has added over 1,600 new service connections within the City's planning area. Growth during this time has resulted in a 54% increase in the number of residential service connections and a 56% increase in the number of commercial and other non-residential service connections, as illustrated in Figure 7.2. The majority of this growth occurred between 2004 and 2006. Since 2007, growth has been flat.

Figure 7.2 : Arizona Water Company Service Area Connections by Type



The other water companies within the City's planning area: Signal Peak Water Company, Carter Water Company, and Woodruff Water Company collectively have less than sixty service connections. There has been very little or no growth in these three water companies' service areas.

GROUNDWATER SUPPLY

Within the City's planning area, AWC currently provides water from seven groundwater wells located in the Coolidge area and from one groundwater well located in the Casa Grande area, through a 16-inch water main located on the west side of Coolidge. These eight wells have a combined supply capacity of over 5,000 gallons per minute ("GPM") or 7.73 million gallons per day ("MGD"), as shown in Table 7a, below.

Table 7a: Well Identification and Source Capacity

Source of Supply	ADWR Well ID Number	Source Capacity (GPM)	Source Capacity (MGD)
Well No. 7	55-616606	1,100	1.60
Well No. 9	55-616608	1,240	1.80
Well No. 10	55-616609	1,430	2.00
Well No. 27	55-568553	455	0.65
Well No. 1 VF	55-616686	250	0.36
Well No. 2 VF	55-616687	250	0.36
Well No. 1 CL	55-620899	350	0.50
Well No. 2 CL	55-620900	320	0.46
	TOTAL	5,395 GPM	7.73 MGD

Woodruff Water Company has one well with a maximum pump yield of 1,760 GPM and Carter Water Company has one well with a maximum pump yield of 20 GPM. Signal Peak Water Company has no wells. Instead AWC supplies water to Signal Peak Water Company from a connection to AWC's Pinal Valley water system.

TREATMENT & STORAGE

AWC's 7.73 MGD of source capacity located within the City Planning Area includes one 1.4 MGD nitrate treatment facility and one 0.7 MGD arsenic treatment facility. The remaining water sources comply with the safe drinking water requirements without treatment, other than chlorination.

Within the City's planning area AWC currently has eight water storage tanks with a combined capacity of over two million gallons. Five of the water storage tanks are centrally located within or near the center of the City. The remaining three water storage tanks are located at Valley Farms, Coolidge Airport and at the Well No. 27 site near Overfield and McCartney Roads.

Carter Water Company has one 2,500-gallon water storage tank for its service area. According to the annual reports on file at the ACC, Woodruff Water Company and Signal Peak Water Company do not list any water storage tanks.

Water Resources Element

WATER CONSERVATION REQUIREMENTS - BEST MANAGEMENT PRACTICES

As part of the ACC and Arizona Department of Water Resources ("ADWR") Best Management Practices, AWC proposed and the agencies approved the following ten water conservation programs for AWC in the City's planning area:

1. **Public Education Program**
2. **Residential Audit Program**
3. **Customer High Water Use Notification**
4. **Customer High Water Use Inquiry Resolution**
5. **Water Waste Investigations and Information**
6. **Special Events/Programs and Community Presentations**
7. **New Homeowner Landscape Information**
8. **Landscape Consultations**
9. **Leak Detection Program**
10. **Meter Repair or Replacement Program**

The first eight water conservation programs are customer-oriented conservation measures. The Leak Detection and Meter Repair or Replacement Programs are water conservation measures AWC uses to monitor and control water loss.

AWC's Leak Detection Program utilizes visual inspection as well as state of the art electronic leak detection equipment to quickly identify leaks and breaks. Consequently, leaks and breaks can be identified quickly and repaired in a timely manner, thus reducing water loss.

AWC's Meter Shop, located in the Coolidge, has established specific meter replacement criteria based on total gallons and years in service. Meter Shop employees also perform periodic testing of meters both while in service and after replacement to provide an ongoing assessment of the current replacement criteria. In this manner, AWC thereby ensures that meter accuracy is maintained and confirmed.

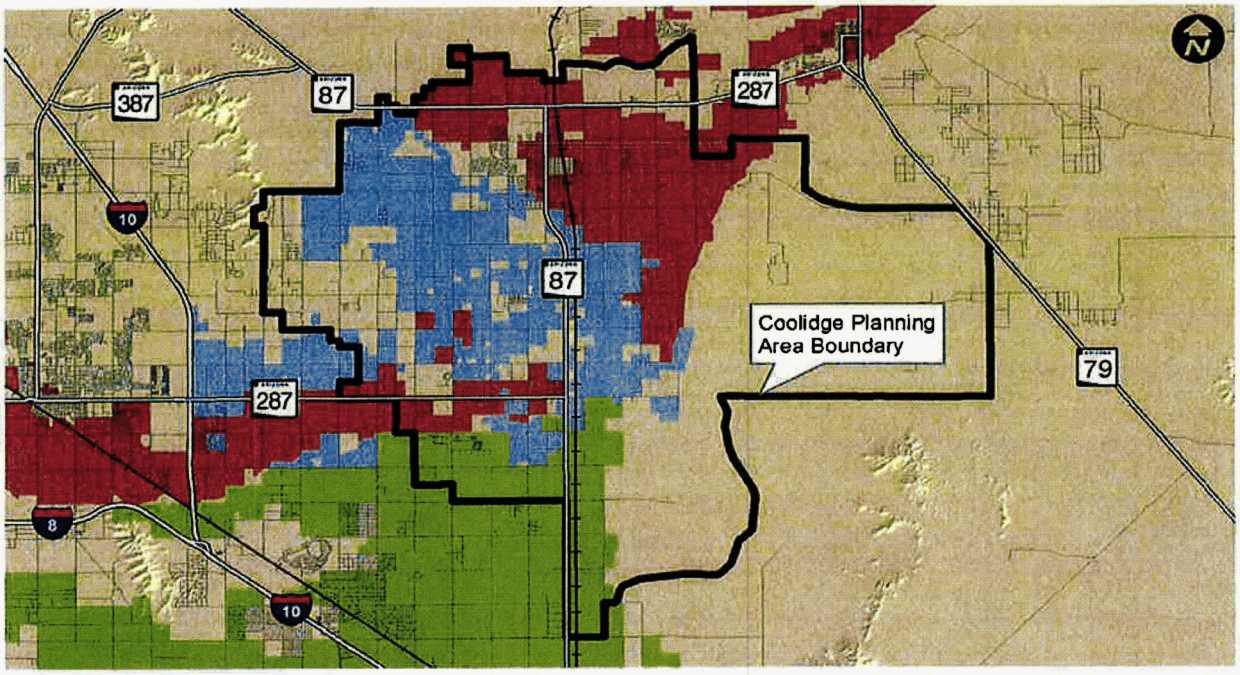
In addition to the water conservation measures described above, the City requires that any new and expanded development adhere to the plumbing guidelines outlined in the *2006 International Plumbing* Code, which provides specific criteria for low-flow water fixtures and appliances. Also, Article XII of the *City of Coolidge Zoning Code* promotes water conservation with specific landscape design and maintenance requirements for all new and expanded developments within the City. Included in Article XII is a low water use plant list which includes a wide variety of trees, plants, shrubs and grasses indigenous to arid regions.

ADDITIONAL SOURCES OF SUPPLY

In addition to the available groundwater supply within the City's planning area, several other sources of supply are available. AWC currently has Central Arizona Project ("CAP") water allocations for its Pinal Valley water system. These municipal and industrial CAP subcontracts entitle AWC to 2,000-acre-feet and 8,884 acre-feet respectively of CAP water per year for AWC's Coolidge and Casa Grande areas, respectively. The other three water companies in the City's planning area do not have CAP allocations.

Hohokam Irrigation and Drainage District ("HIDD") provides irrigation water for 41 square miles of agricultural land within the planning area. San Carlos Irrigation and Drainage District ("SCIDD") provides irrigation water for 35 square miles of agricultural land within the planning area. Central Arizona Irrigation and Drainage District ("CAIDD") provides irrigation water for 14 square miles of agricultural land within the planning area. Figure 7.3 shows the service area for each irrigation and drainage district.

Figure 7.3 : Irrigation and Drainage Districts



Hohokam Irrigation District | San Carlos Irrigation District | Central Arizona Irrigation District

HIDD receives 47,303 acre-feet of non-Indian agricultural CAP water per year. HIDD also banks over 85,000 acre-feet of water annually for the Arizona Water Banking Authority. When available, SCIDD also has the ability to receive and deliver over 100,000 acre-feet of Gila River water annually. SCIDD delivers over 35,000 acre-feet of CAP water annually for agricultural irrigation. CAIDD delivers 325,000 acre-feet annually for agricultural irrigation; 124,000 acre-feet come from CAP allocations.

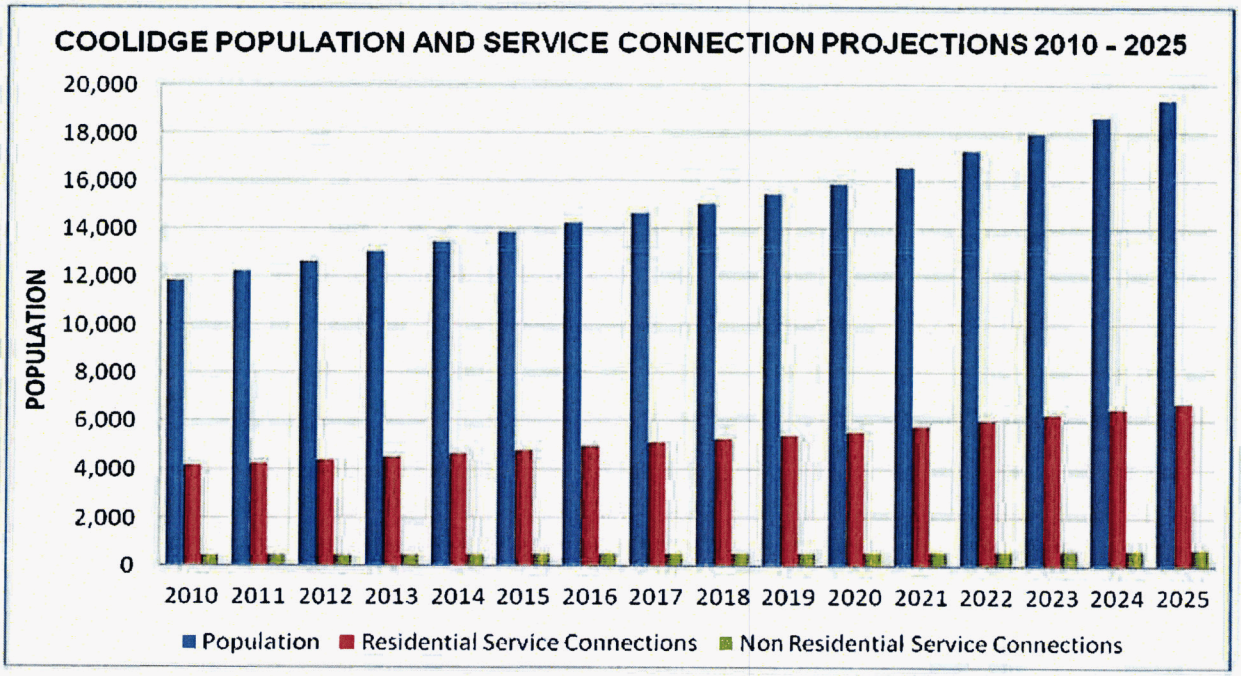
The City's wastewater treatment facility receives and treats up to 1 million gallons per day. The treated reclaimed water is then delivered to adjacent farms for non-edible crops.

Water Resources Element

POPULATION & SERVICE CONNECTION PROJECTIONS

The 2010 census data estimates an average of 2.88 persons per household in the City's planning area. Central Arizona Governments ("CAG") estimates a growth rate of 3.4 percent between 2010 and 2020, and 4.45 percent between the 2020 and 2025. Based on this population per household and growth rate data, the City estimates its planning area could have a population of over 19,000 by the year 2025. Utilizing the same census data, there could be over 6,700 residential and nearly 700 non-residential service connections in the City's planning area by the year 2025.

Figure 7.4 : Coolidge Planning Area Projections 2010-2025



WATER DEMANDS

Current Demands

Annual water demands within the City have grown from nearly 550 million gallons in 2002, to nearly 800 million gallons in 2012, representing a 46% increase in annual water demands during this time period. The majority of this increase in water demands occurred between 2002 and 2007. Since 2007, demands have been stable. Figure 7.5 shows the historical water demands from 2002 through 2012.

Projected Demands

Based on AWC's 2012 average water demands for customers within the City and surrounding areas and CAG estimated population growth rates, AWC estimates water demands could be over 1.2 billion gallons per year by 2025 for the Coolidge area. As stated previously, growth will predominantly occur in Zone 1 within the City's planning area. Figure 7.6 shows the projected water demands from 2012 through 2025.

Figure 7.5 : Coolidge Historical Water Demands

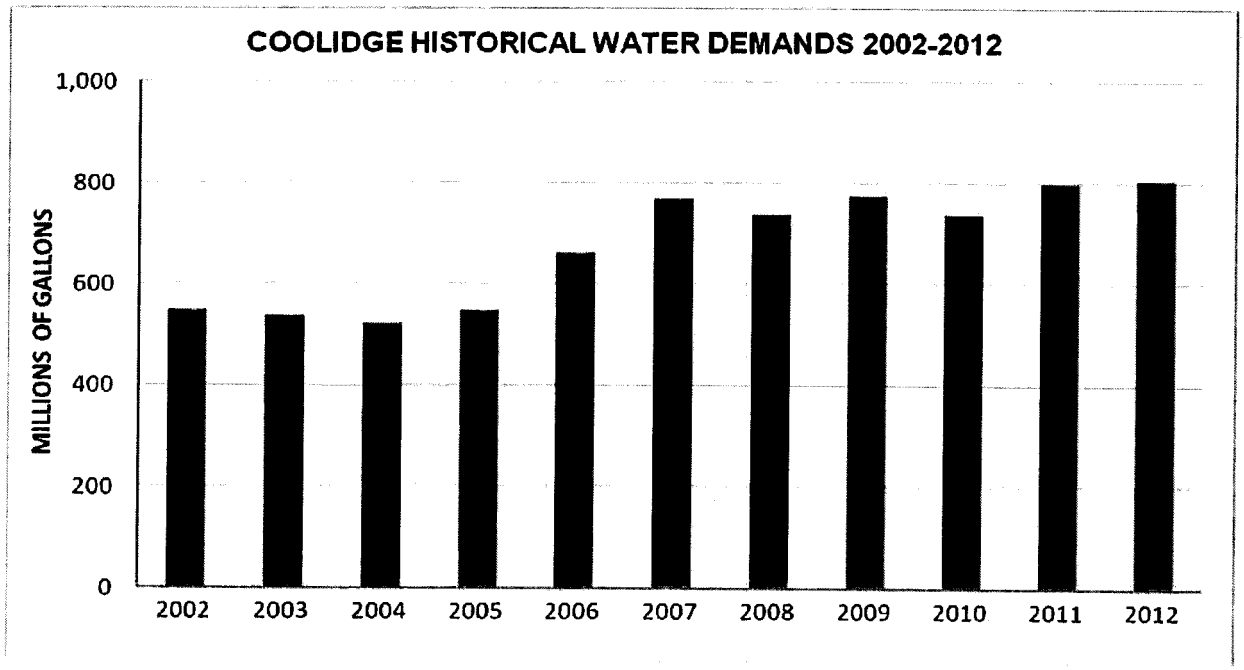
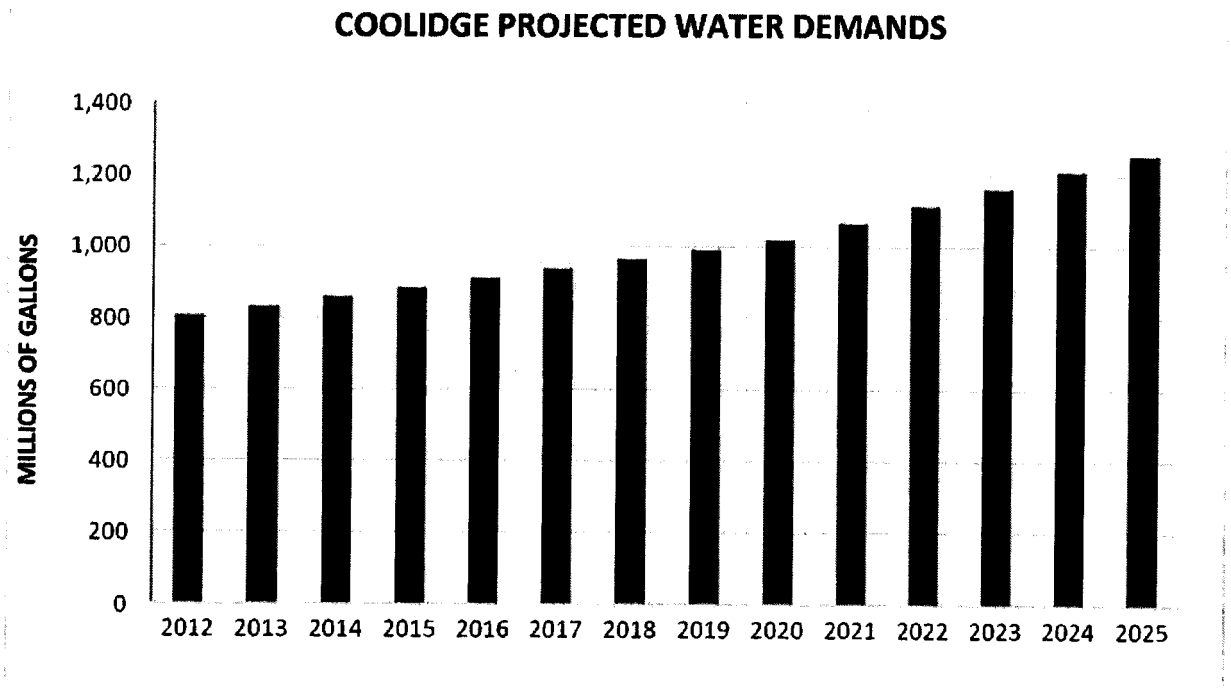


Figure 7.6 : Coolidge Projected Water Demands



Water Resources Element

FUTURE PLANNING

Short-Term Planning

To meet the projected annual demands of 1.2 billion gallons in 2025 for the City's planning area, by 2025 it will be necessary to acquire or develop additional sources of supply. To meet these new demands, AWC plans to drill and equip six wells within the City's planning area. These six new wells will be funded primarily by developers as part of developing new subdivisions. The new wells are needed to meet the projected demands of these new subdivisions.

AWC is also developing a plan to use its CAP water allocation through groundwater recharge, storage and recovery. Recharge is accomplished through direct basin recharge, either by spreading CAP water in ponds to percolate down through the soil, to be stored in local groundwater basins or pumping CAP water through injection wells directly into the groundwater basin. In both instances, the CAP water is stored in what is known as an Underground Storage Facility ("USF"). AWC then recovers the stored CAP water through its recovery wells and delivers it to AWC's customers in Coolidge and elsewhere in the Pinal Valley water system.

Long-Term Planning

AWC also has identified several long-terms plans to meet the growing demands in the City's planning area as further described below.

AWC will utilize the full amount of its CAP water allocations and, if necessary, acquire additional CAP water allocations as they become available. AWC has a site in the southern portion of the City's planning area (Figure 7.7) to utilize its CAP water. AWC has plans for a CAP surface water treatment facility at this site, which would employ best available treatment technology for direct potable use. AWC extended the schedule for the CAP surface water treatment facility originally scheduled for 2012 because of the severe downturn in homebuilding in Pinal County. Meanwhile, AWC will design and operate facilities at this site to recharge, store and recover CAP water as a lower cost method of using CAP water until a treatment plant is needed.

Under this plan, AWC will take delivery of CAP surface water from a planned 24-inch transmission main from the CAP canal to the recharge site. The CAP surface water will flow into one or more recharge basins and percolate into the groundwater basin and be stored pursuant to a USF permit from ADWR. AWC will recover stored CAP surface water from wells at the recharge, storage and recovery site and from other wells in the AWC Pinal Valley service area, pursuant to recovery well permits from ADWR. The water recovered from the on-site wells will flow from the site through a 36-inch transmission main to the Pinal Valley water system. The groundwater recharge, storage and recovery facility will assure long-term availability of sustainable water supplies for AWC's customers in Coolidge and elsewhere in the Pinal Valley water system.

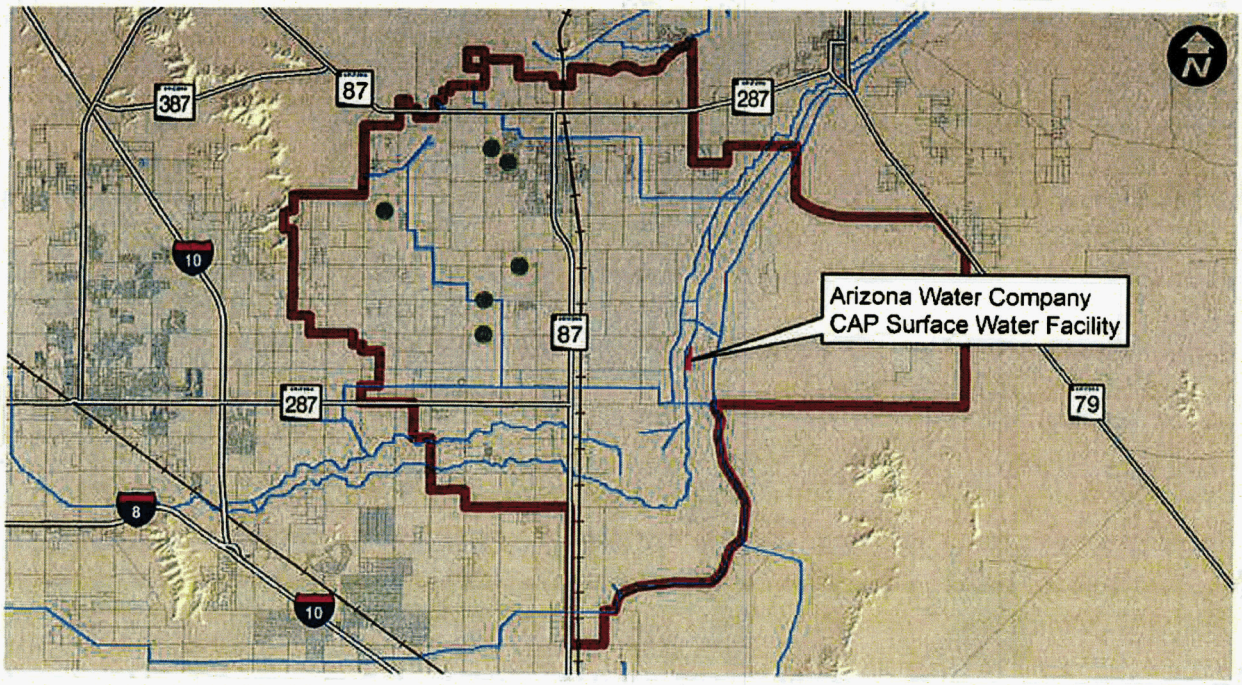
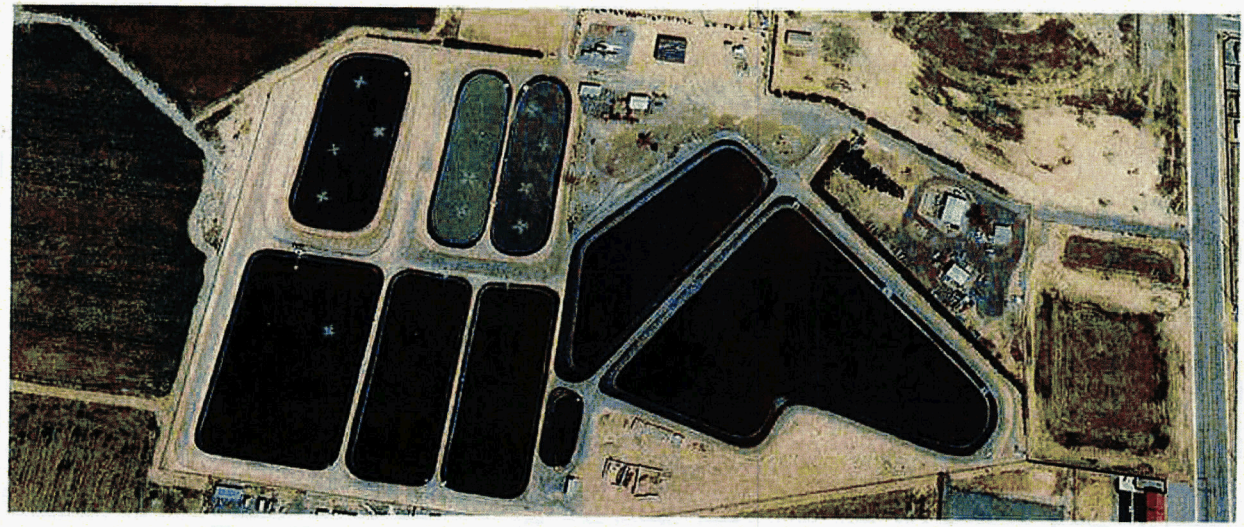


Figure 7.7 : Future Water Demand Planning

● Future Well Sites Canals City of Coolidge Planning Area

The City's wastewater reclamation facility will also provide another source of water for the City's planning area. While currently treating up to one million gallons per day, the water reclamation facility has an expansion capability of up to four million gallons per day which could be delivered to additional agricultural users. Upgrades to the City's wastewater reclamation facility to Class A+ quality reclaimed water will also allow reclaimed water to be recharged into groundwater basins. Other long-term plans for additional supplies within the City of Coolidge planning area will focus on the conversion of water used for agriculture to municipal/industrial uses.



City of Coolidge Wastewater Treatment Plant

I have never yet seen any plan which has not been mended by the observations of those who were much inferior in understanding to the person who took the lead in the business.

-Edmund Burke

A-2 Hydrogeologic Study Arizona Water Company

ARIZONA WATER COMPANY
PINAL VALLEY RECHARGE UNDERGROUND STORAGE FACILITY
AND WATER STORAGE PERMIT APPLICATIONS
AND
PINAL VALLEY RECHARGE USF HYDROGEOLOGIC STUDY

Prepared for:

Arizona Water Company
P.O. Box 29006 Phoenix, Arizona 85038
3805 N. Black Canyon Hwy. Phoenix, Arizona 85015
ATTN: Andy Haas, P.E.
(602) 240-6860 x231

Prepared By:

Clear Creek Associates
6155 E. Indian School Road, Suite 200
Scottsdale, Arizona 85251
ATTN: Don Hanson, R.G. and Steve Corell, R.G.
(480) 659-7131

December 17, 2014

CLEAR CREEK ASSOCIATES

REGISTERED GEOLOGIST
CERTIFICATE NO.
26036
DONALD P.
HANSON
Date Signed 12-17-14
ARIZONA, U.S.A.

Exp 3-31-16

ARIZONA WATER COMPANY
PINAL VALLEY RECHARGE UNDERGROUND STORAGE FACILITY
AND WATER STORAGE PERMIT APPLICATIONS
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CLEAR CREEK ASSOCIATES

December 17, 2014

ARIZONA DEPARTMENT OF WATER RESOURCES
Water Management Division
3550 North Central Ave, 2nd Floor
Phoenix, Arizona 85012-2105
Phone (602) 771-8585 Fax (602) 771-8689

APPLICATION FOR UNDERGROUND STORAGE FACILITY PERMIT (A.R.S. § 45-811.01)

FOR OFFICE USE ONLY
Application No.: _____
Date Received: _____

The initial fee for an Underground Storage Facility Permit Application is $2,000. Total fees for this application are based upon an hourly billable rate, which can be found on the ADWR web site @www.azwater.gov. If the costs of reviewing your application exceed $2,000, you will be invoiced for the difference, up to a maximum total fee of $25,000. Payment may be made by cash, check, or credit card, (if you wish to pay by credit card, please contact the Recharge Program at 602-771-8599). Checks should be made payable to the Arizona Department of Water Resources. In addition to the hourly application fee, the applicant must pay any review-related costs associated with the application and the actual cost of mailing or publishing any legal notice of the application or any notice of a pre-decision administrative hearing on the application. Review related costs are: (1) costs associated with a pre-decision hearing on the application, such as court reporter services and facility rentals for the hearing, and (2) mileage expenses for a site visit conducted before issuing a decision on the application. **Failure to enclose the initial application fee will cause the application to be returned. Fees for an Underground Storage Facility Permit Application are authorized by A.R.S. § 45-871.01 and A.A.C. R12-15-103.**

FACILITY DESIGN: (check one)

- [X] **Constructed**
- [ ] **Managed**

APPLICATION FOR: (check one)

- [X] **Underground Storage Facility (USF)**
- [ ] **Modification of USF permit no.:**
  71-_____
- [ ] **Renewal of USF permit no.:**
  71-_____

GENERAL INFORMATION

1. Name of Applicant: Arizona Water Company

   3805 N. Black Canyon Highway — Phoenix, — AZ. — 85015-5351
   Mailing Address — City — State — Zip

   Contact Person: Fredrick Schneider, P.E. Telephone: (602)240-6860 Fax: (602)240-6878

2. Is this a State Demonstration Project? _____ Yes __X__ No

   (**NOTE:** Pursuant to A.R.S. § 45-893.01, **only** Conservation Districts qualify to participate in State Demonstration Project program.)

3. Name of Active Management Area or Irrigation Non-Expansion Area where the facility will be located:

   Pinal Active Management Area

   (If the facility is NOT located within an AMA or INA, please indicate "NONE.")

4. Name of groundwater basin and subbasin where the facility will be located: _____

   Eloy sub-basin of the Pinal Active Management Area

5. Legal description of the location of the facility: Portion of Western ½ of Section 18 Township 6S, Range 9E, Gila & Salt River Baseline & Meridian
(quarter/quarter/quarter/section, township and range – see Appendix C of USF Application Guide)

6. Does the applicant own the land where the facility is to be located? X Yes _____ No

7. The total design capacity of the facility: 217,680
(acre-feet to be stored over the duration of the USF permit)

8. The maximum annual amount of water proposed for storage at this facility: 10,884
(acre-feet per year)

9. Proposed duration of permit: 20 years
(years)

10. Type of source water to be stored:

☒ CAP Water ☐ Effluent ☐ Decreed and Appropriative Surface Water

If Decreed and Appropriative Surface Water, list river(s): _____

11. I agree under penalty of law to obtain any required floodplain use permit from the county flood control district before beginning any construction activities, as required by A.R.S. § 45-811.01(C)(4). ☒ Agree ☐ Disagree

12. **For managed USFs where effluent will be stored only:** Are you requesting that this facility be designated as a facility that could add value to a national park, national monument or state park, as described in A.R.S. § 45-811.01(D)?

☐ Yes ☐ No

If yes, please submit a completed USF Permit Application Supplement to designate a Managed Underground Storage Facility as one that could add value to a national park, national monument, or state park and all additional information as described on the USF Permit Application Supplement.

13. **For permit modifications only**, give a brief description of the modification(s) requested by this application: _____

_____

_____

SUPPORTING EVIDENCE

Check the following items that have been included with this submittal. For a new USF application, all items **must** be submitted prior to receiving a complete and correct determination by the Department. For a modification to an existing USF permit, submit only those items that apply to the modification. For a full description of these requirements refer to the USF Application Report in the USF Application Guide.

14. USF Site and Facility Characteristics:

☒ Site Characteristics ☒ Geology

☒ Facility Characteristics ☒ Hydrogeology

15. Unreasonable Harm and Hydrologic Feasibility Analysis:

- ☒ Procedures and Results for Calculating Maximum Area of Impact and Mounding Analysis
- ☒ Land and Water Use Inventory
- ☒ Unreasonable Harm Analysis
- ☒ Monitoring Plan
- ☒ Water Quality
- ☒ Hydrologic Feasibility Conclusions
- ☒ Operation and Maintenance

16. Legal Requirements:

- ☒ Technical Capability
- ☒ Financial Capability
- ☒ Legal Access

NOTARIZED SIGNATURE

I (We), Fredrick Schneider, P.E., the applicant(s) named in this application, do hereby certify under the penalty of perjury, that the information contained and statements made herein are to the best of my (our) knowledge and belief true, correct and complete.

(602) 240-6860
Telephone

Signature of owner or authorized agent
PA# 000267

Vice President - Engineering
Title

3805 N. Black Canyon Highway	Phoenix,	AZ.	85015-5351
Mailing Address	City	State	Zip

STATE OF ARIZONA)
) ss.
County of MARICOPA)

Subscribed and sworn to before me this 17th day of December, 20 14

Notary Public

Feb. 17, 2018
My commission expires

ANN FRANCES HEIL
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
February 17, 2018

ARIZONA DEPARTMENT OF WATER RESOURCES
Water Management Division
3550 North Central Ave, 2nd Floor
Phoenix, Arizona 85012-2105
Phone (602) 771-8500 Fax (602) 771-8689

APPLICATION FOR WATER STORAGE PERMIT (A.R.S § 45-831.01)

FOR OFFICE USE ONLY
Application No.: _____
Date Received: _____

The initial fee for a Water Storage Permit Application is $1,000. Total fees for this application are based upon an hourly billable rate, which can be found on the ADWR web site @www.azwater.gov. If the costs of reviewing your application exceed $1,000, you will be invoiced for the difference, up to a maximum total fee of $10,000. Payment may be made by cash, check, or credit card, (if you wish to pay by credit card, please contact the Recharge Program at 602-771-8599). Checks should be made payable to the Arizona Department of Water Resources. In addition to the hourly application fee, the applicant must pay any review-related costs associated with the application and the actual cost of mailing or publishing any legal notice of the application or any notice of a pre-decision administrative hearing on the application. Review related costs are: (1) costs associated with a pre-decision hearing on the application, such as court reporter services and facility rentals for the hearing, and (2) mileage expenses for a site visit conducted before issuing a decision on the application. **Failure to enclose the initial application fee will cause the application to be returned. Fees for a Water Storage Permit Application are authorized by A.R.S. § 45-871.01 and A.A.C. R12-15-103.**

PLEASE SUBMIT ONE ORIGINAL AND ONE COPY OF THE COMPLETED APPLICATION AND ALL SUPPORTING MATERIALS

APPLICATION FOR: (Check one)

☒ **New Water Storage Permit** ☐ **Modification of Water Storage Permit** No. 73-_____ ☐ **Renewal of Water Storage Permit** No. 73-_____

GENERAL INFORMATION

1. Name of Applicant: Arizona Water Company

   3805 N. Black Canyon Highway Phoenix, AZ. 85015-5315
   Mailing Address City State Zip

   Contact Person: Fredrick Schneider, P.E. Telephone: (602)240-6860 Fax: (602)240-6878

2. Name and permit number of storage facility where water storage will occur: Pinal Valley Recharge Project

3. Name of Active Management Area or Irrigation Non-Expansion Area where the facility will be located:
   Pinal Active Management Area
   (If the facility is NOT located within an AMA or INA, please indicate "NONE.")

4. Name of groundwater basin and subbasin where the facility will be located: Eloy sub-basin, Pinal Active Management Area

5. If this water storage permit application is for the storage of CAP water and meets the requirements of A.R.S. §§ 45-831.01(G) or 45-871.01(E) and the applicant will **not** also be the holder of the storage facility permit, please submit a consent agreement signed by the facility permit holder.

6. The maximum annual amount of water that may be stored at the facility: 10,884
(acre-feet per year)

7. The maximum annual amount of water proposed for storage pursuant to this water storage permit: 10,884
(acre-feet per year)

8. Proposed duration of the permit: 20-years

9. The maximum amount of water proposed for storage for the duration of the permit pursuant to this water storage permit:
217,680
(acre-feet)

10. The stored water will be recovered **(select one)**:

☐ Only on an annual basis pursuant to ARS § 45-851.01

☐ Only be credited to long-term storage account #70-_____

☒ Either recovered on an annual basis and/or credited to long term storage account #70- 431230.0000

11. Type of source water to be stored:

☒ CAP Water ☐ Effluent ☐ Decreed and Appropriative Surface Water

If Decreed and Appropriative Surface Water, list river(s): _____

[**NOTE:** In order for the storer to accrue long-term storage credits for the stored water, the source water must comply with A.R.S. § 45-802.01(21), "Water that cannot reasonably be used directly".]

12. If the water to be stored is appurtenant to a place of use, the legal description of the location of that use: _____

(quarter/quarter/quarter/section, township and range)

13. What is the applicant's legal right to use the proposed source(s) of water?

☒ CAP Contract ☐ Right to municipally treated effluent ☐ Decreed and appropriative surface water right

☐ Other, please explain: _____

Cite the right number, law, court decree, contract or other legal basis for acquiring and using each source of water to be stored pursuant to this permit: See attached CD with copies of Arizona Water Company's Casa Grande and Coolidge CAP subcontracts.

If municipally treated effluent will be stored and the applicant is the producer of the effluent, does the applicant certify that, after meeting all contractual obligations for delivery of effluent to other parties, the applicant retains the legal right to the volume of effluent requested in item 7 of this application? ☐ Yes ☐ No

14. Do you own the system through which the water to be stored will be delivered to the storage/savings facility?

☒ Yes ☐ No **If no**, please provide a copy of the transportation agreement that allows the proposed water delivery system to be used to carry the water to be stored to the storage/savings facility.

15. Do you want this water storage permit to be designated as storing non-recoverable water pursuant to A.R.S. § 45-833.01?

☐ Yes ☒ No

16. **For effluent storage:**

Is the facility where storage is to occur currently regulated under an Aquifer Protection Permit (APP) issued by the Arizona Department of Environmental Quality? ☐ Yes ☐ No

If no, will the applicant be obtaining an APP? ☐ Yes ☐ No

If no to both, please explain method of compliance with A.R.S. § 45-831.01(B)(2): _____

17. **For water storage at a Groundwater Savings Facility,** if the applicant is **not** the GSF permit holder, does the applicant agree to comply with the Plan of Operation for the GSF permit listed in Item 2 of this application? ☐ Yes ☐ No

NOTARIZED SIGNATURE

I (We), Fredrick Schneider, P.E., the applicant(s) named in this application, do hereby certify under the penalty of perjury, that the information contained and statements made herein are to the best of my (our) knowledge and belief true, correct and complete.

(602) 240-6860
Telephone

Signature of owner or authorized agent
DA# 000367

Vice President - Engineering
Title

3805 N. Black Canyon Highway — Mailing Address
Phoenix, — City
AZ. — State
85015-5351 — Zip

STATE OF ARIZONA)
) ss.
County of Maricopa)

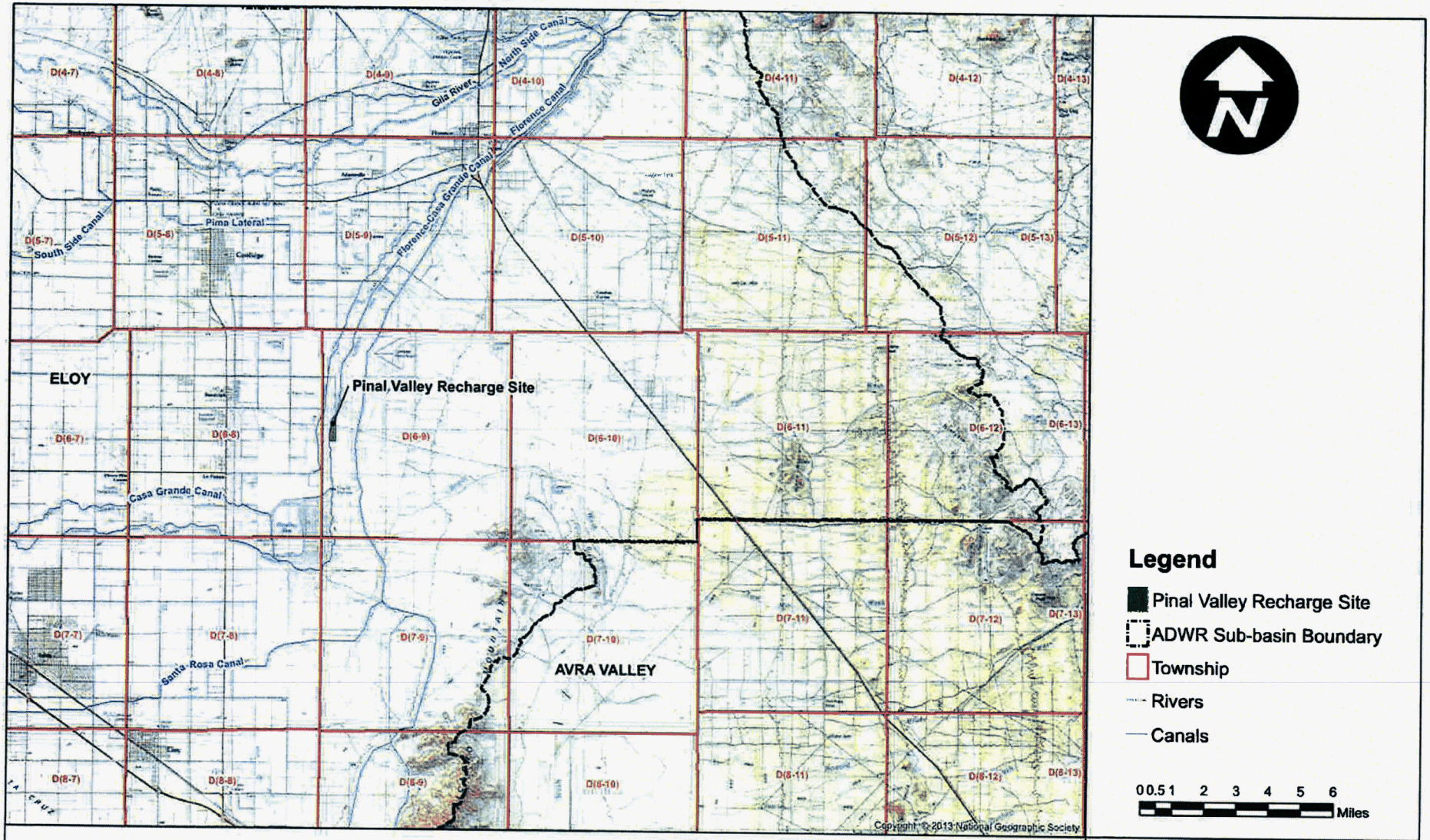
Subscribed and sworn to before me this 17th day of December, 20 14.

Notary Public

ANN FRANCES HEIL
Notary Public - State of Arizona
MARICOPA COUNTY
My Commission Expires
February 17, 2018

Feb. 17, 2018
My commission expires

FIGURES

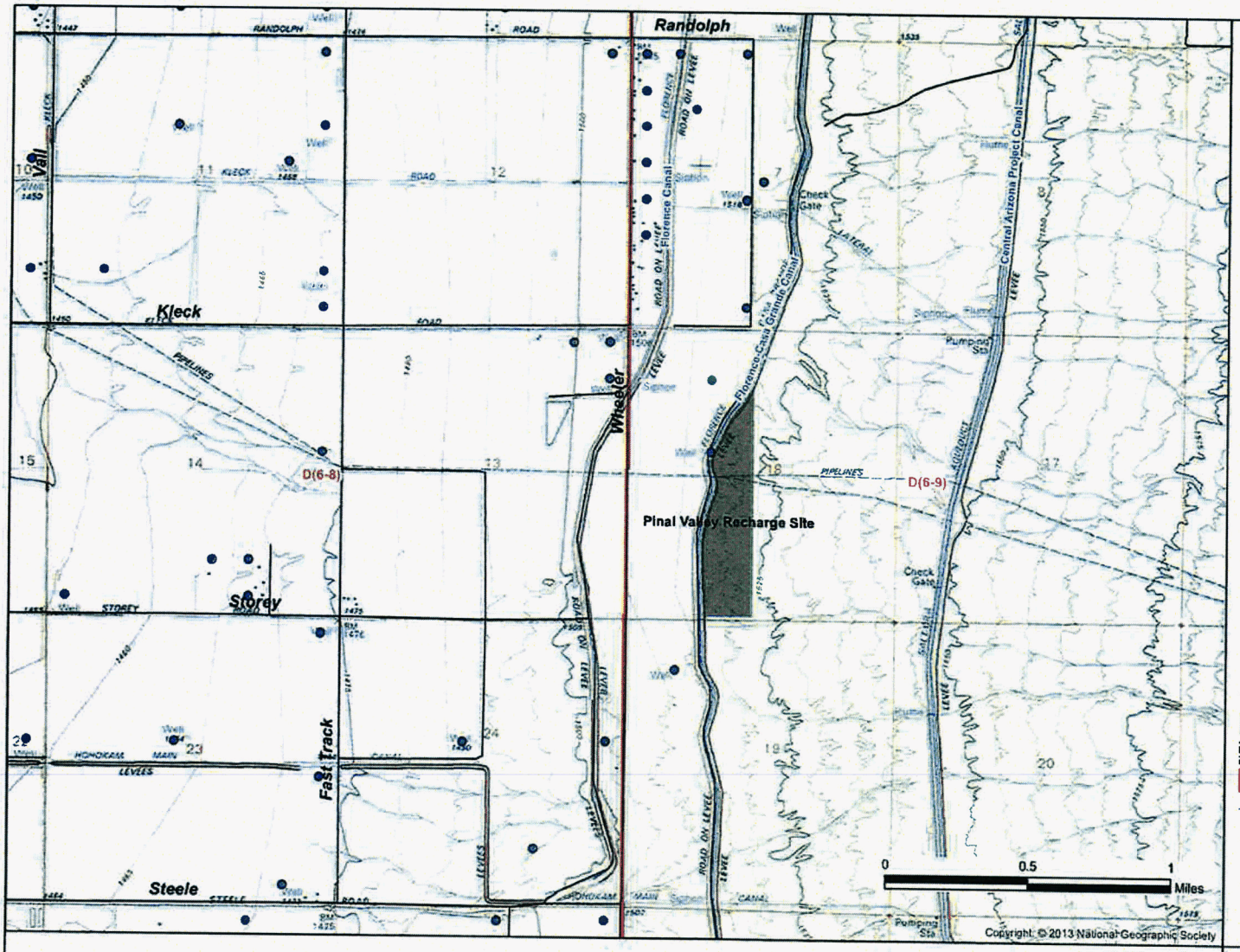


Regional Map PVRP

6155 East Indian School Road
Suite 200
Scottsdale, Arizona 85251
(480) 659-7131
CLEAR CREEK ASSOCIATES

Date: December 2014
Drafted: SWC
Revision: 1

Figure 1



Legend

- ADWR Registered Water Wells
- Streets Pinal County
- Pinal Valley Recharge Site
- ADWR Sub-basin Boundary
- Township
- Canals

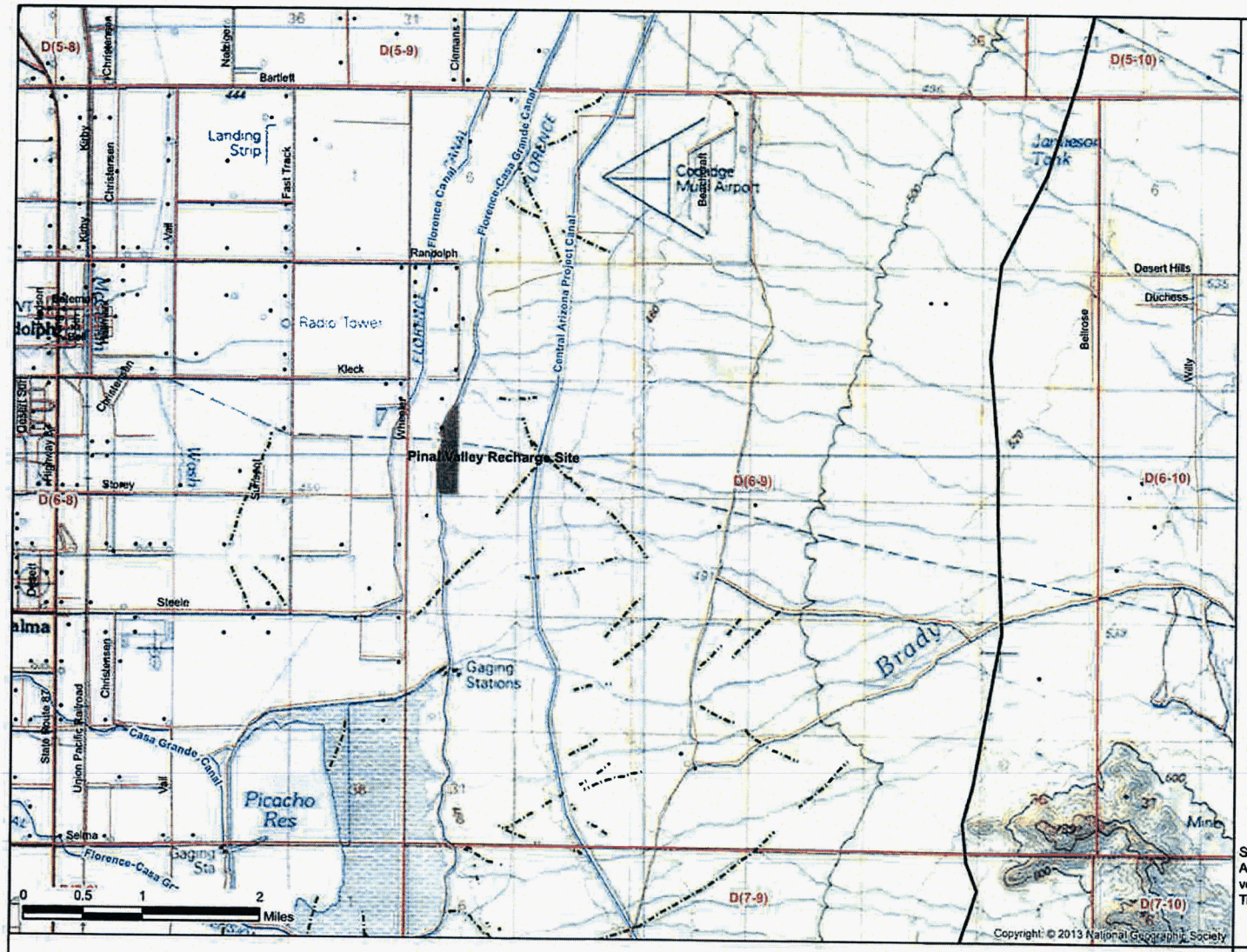
Local Site Map PVRP

6155 East Indian School Road
Suite 200
Scottsdale, Arizona 85251
(480) 659-7131

CLEAR CREEK ASSOCIATES

Date: December 2014
Drafted: SWC
Revision: 1

Figure 2



Legend

- ADWR Registered Water Wells

Earth Fissure Traces (June 22, 2009)

- Continuous Earth Fissure
- Discontinuous Earth Fissure
- Reported, Unconfirmed Earth Fissure
- Streets Pinal County
- Pinal Valley Recharge Site
- Arizona Active Land Subsidence Areas (2010)
- ADWR Sub-basin Boundary
- Township
- Canals

Source:
Arizona Geological Survey Digital Information 39 (DI-39), version 03.31.14. Location of Mapped Earth Fissure Traces in Arizona.

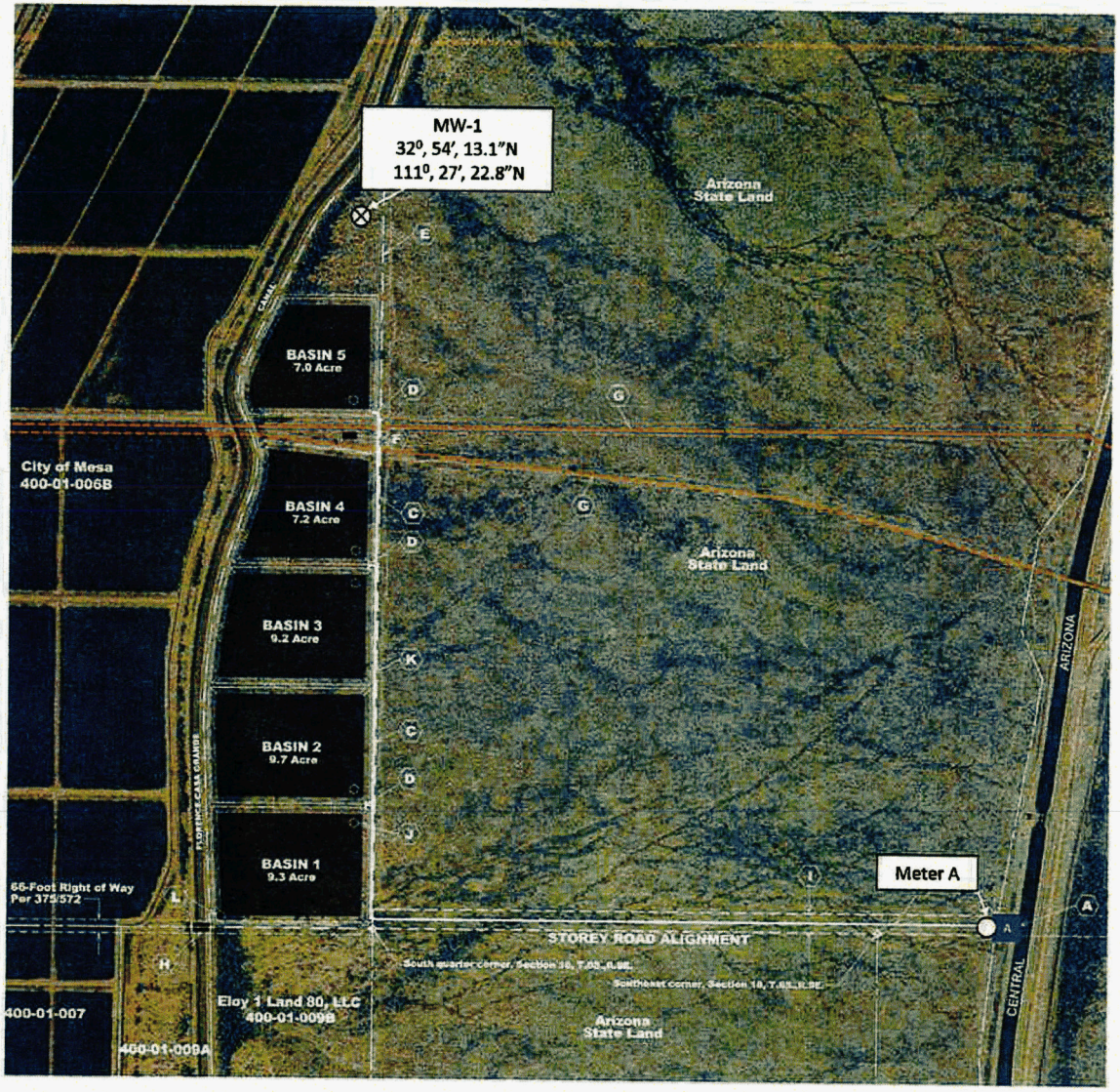
Earth Fissure Traces Near PVRP

6155 East Indian School Road
Suite 200
Scottsdale, Arizona 85251
(480) 659-7131

CLEAR CREEK ASSOCIATES

Date: December 2014
Drafted: SWC
Revision: 1

Figure 3



EXPLANATION

- Flow Meter for Water Quantity Measurement
- Proposed Monitoring Well MW-1 for Monitoring Groundwater Levels and Quality with Lat/Long
- Proposed Source Water Quality Sampling Point

N

APPROXIMATE SCALE
600 FEET

FIGURE 4a
SITE LAYOUT
AWC Pinal Valley Recharge Project

CLEAR CREEK ASSOCIATES

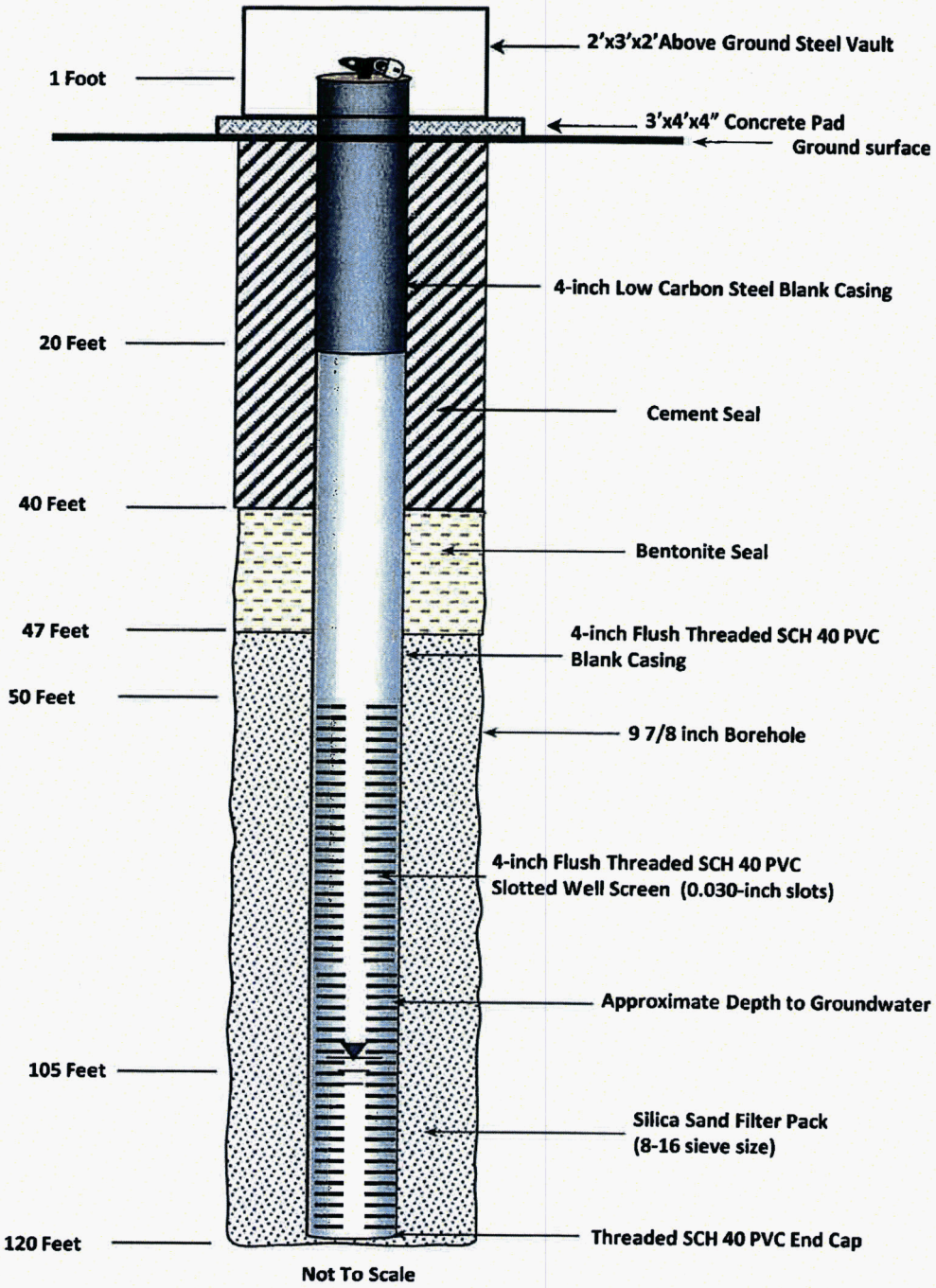
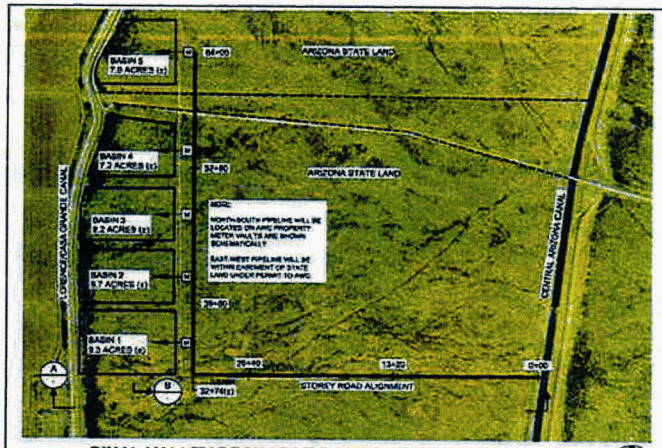


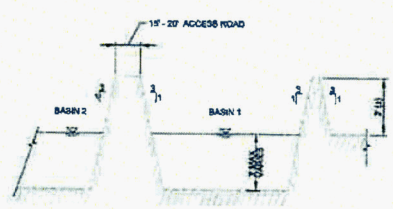
FIGURE 4b
PROPOSED MONITORING WELL DESIGN

PVRP SITE

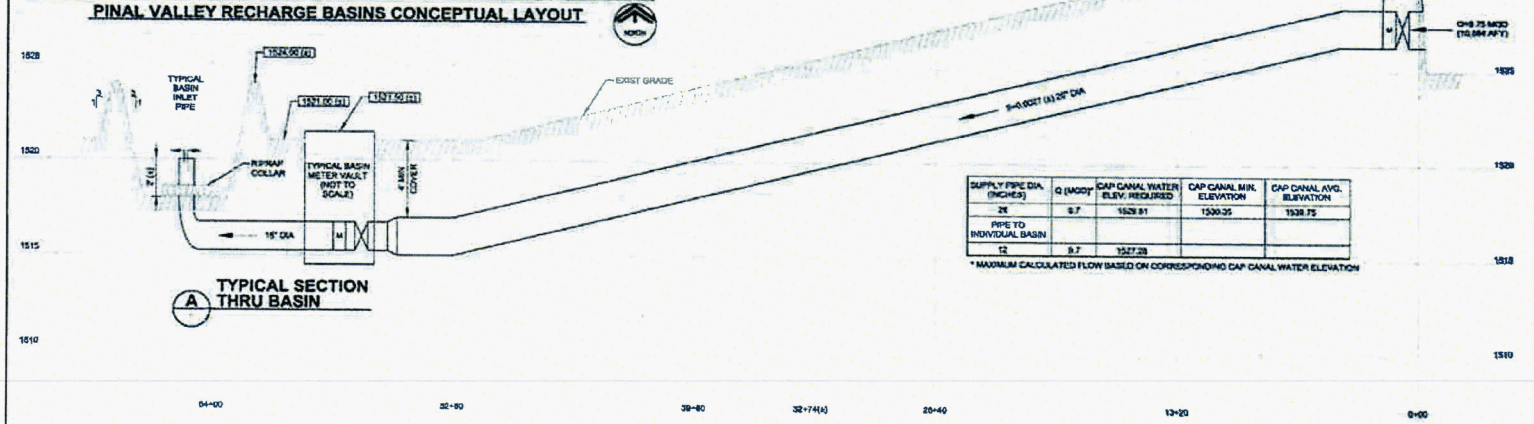
CLEAR CREEK ASSOCIATES



PINAL VALLEY RECHARGE BASINS CONCEPTUAL LAYOUT



B TYPICAL SECTION THRU BASIN



A TYPICAL SECTION THRU BASIN

SUPPLY PIPE DIA. (INCHES)	Q (MGD)*	CAP CANAL WATER ELEV. REQUIRED	CAP CANAL MIN. ELEVATION	CAP CANAL AVG. ELEVATION
26	9.7	1529.91	1530.35	1528.75
PIPE TO INDIVIDUAL BASIN				
12	9.7	1527.28		

* MAXIMUM CALCULATED FLOW BASED ON CORRESPONDING CAP CANAL WATER ELEVATION

PINAL VALLEY RECHARGE BASINS SUPPLY PIPELINE - CONCEPTUAL PROFILE

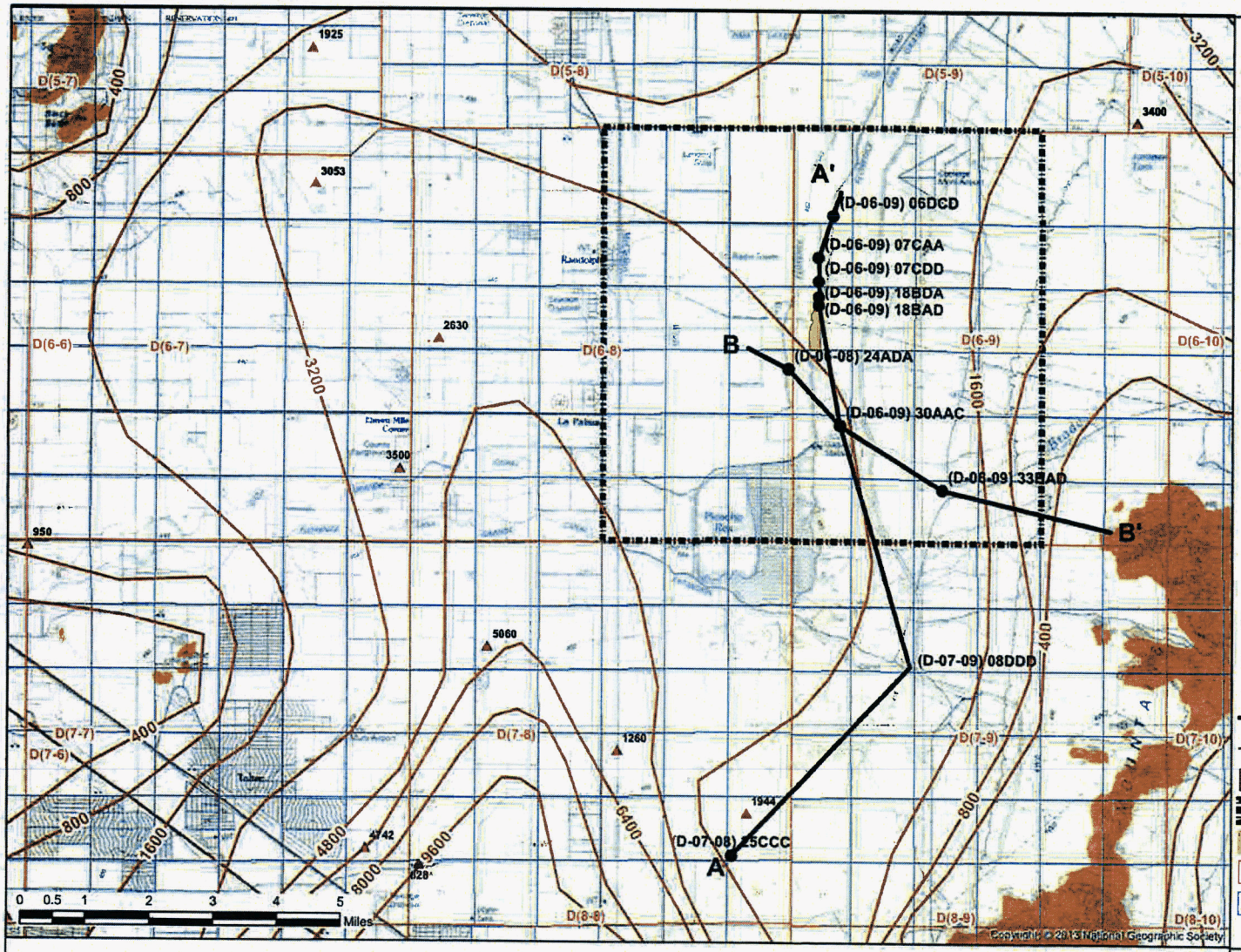
HORIZ SCALE: 1" = 400'
VERT SCALE: 1" = 5'

FIGURE 1
ARIZONA WATER COMPANY

carollo
Engineers . Working Wonders With Water

FIGURE 4c
CONCEPTUAL LAYOUT AND PROFILE

CLEAR CREEK ASSOCIATES



Legend

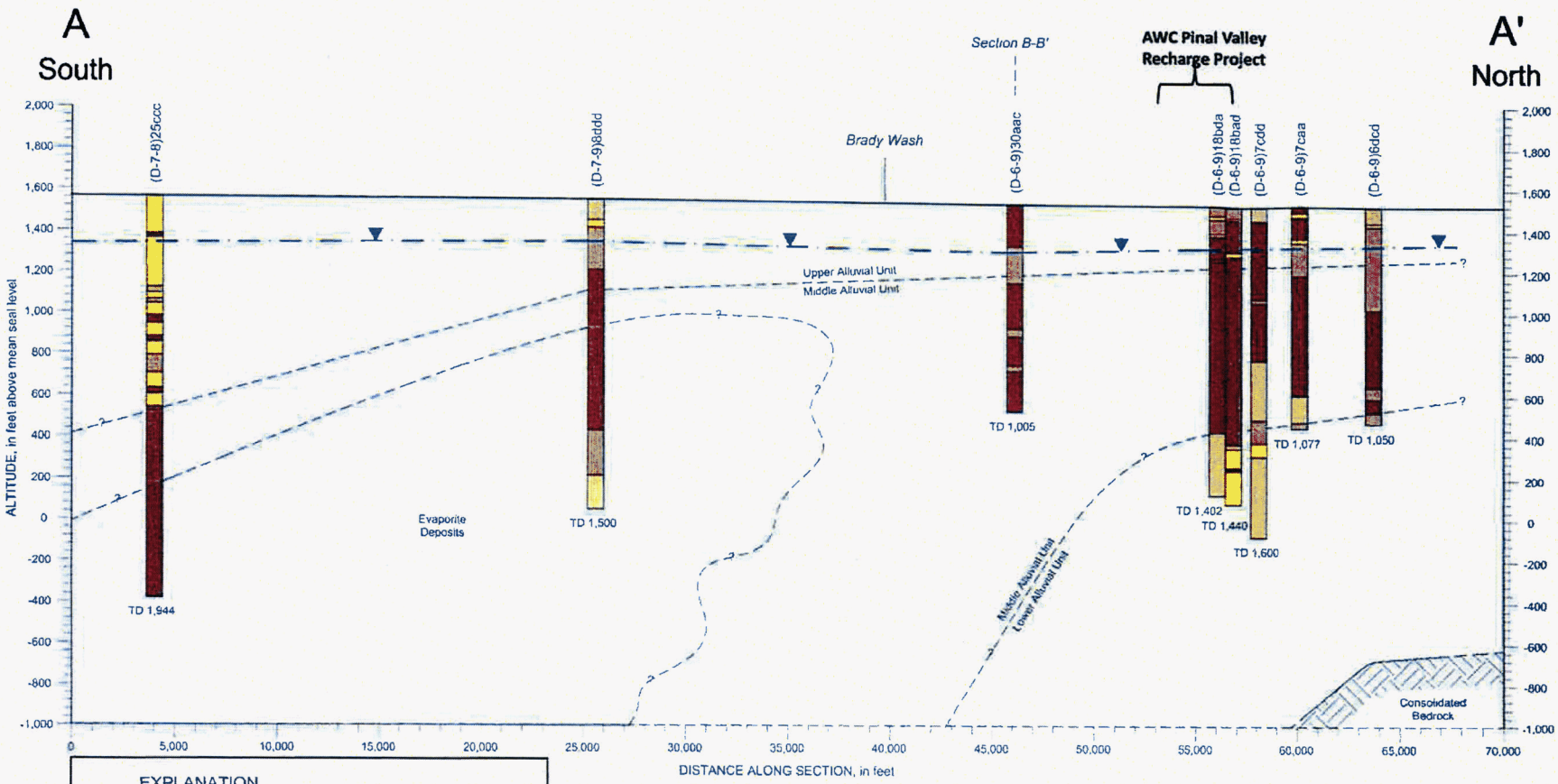
- Selected Well with Drillers' Log
- AZGS Depth to Bedrock Boreholes
- Cross Section Location
- AZGS Depth to Bedrock Contours
- Bedrock
- PVRP Study Area
- Pinal Valley Recharge Site
- Township
- Section

DEPTH TO BEDROCK AND CROSS SECTION LOCATION
Arizona Water Company Pinal Valley Recharge Project

6155 East Indian School Road
Suite 200
Scottsdale, Arizona 85251
(480) 659-7131
CLEAR CREEK ASSOCIATES

Date: December 2014
Drafted: SWC
Revision: 1

FIGURE 5



EXPLANATION

GENERALIZED LITHOLOGIC CLASSIFICATION OF MATERIALS AS SHOWN ON GRAPHIC LOGS

- SAND AND GRAVEL; nonlithified; estimated LARGE PERMEABILITY
- SILTY OR CLAYEY SAND, SILTY OR CLAYEY GRAVEL, FINE SAND; may be weakly lithified; estimated MODERATELY LARGE PERMEABILITY
- UNDIFFERENTIATED: includes drillers' log descriptions "conglomerate", "rock and conglomerate", "overburden", "sand/gravel and clay"; PERMEABILITY may be SMALL TO LARGE
- SANDY CLAY; MODERATELY-LITHIFIED COARSE-GRAINED SEDIMENTS; estimated SMALL PERMEABILITY
- CLAY AND SILTY CLAY; LITHIFIED SEDIMENTS; estimated VERY SMALL PERMEABILITY

TD 1,100 TOTAL DEPTH, in feet below land surface

HYDROGEOLOGIC CONTACT - dashed where approximate; queried where uncertain

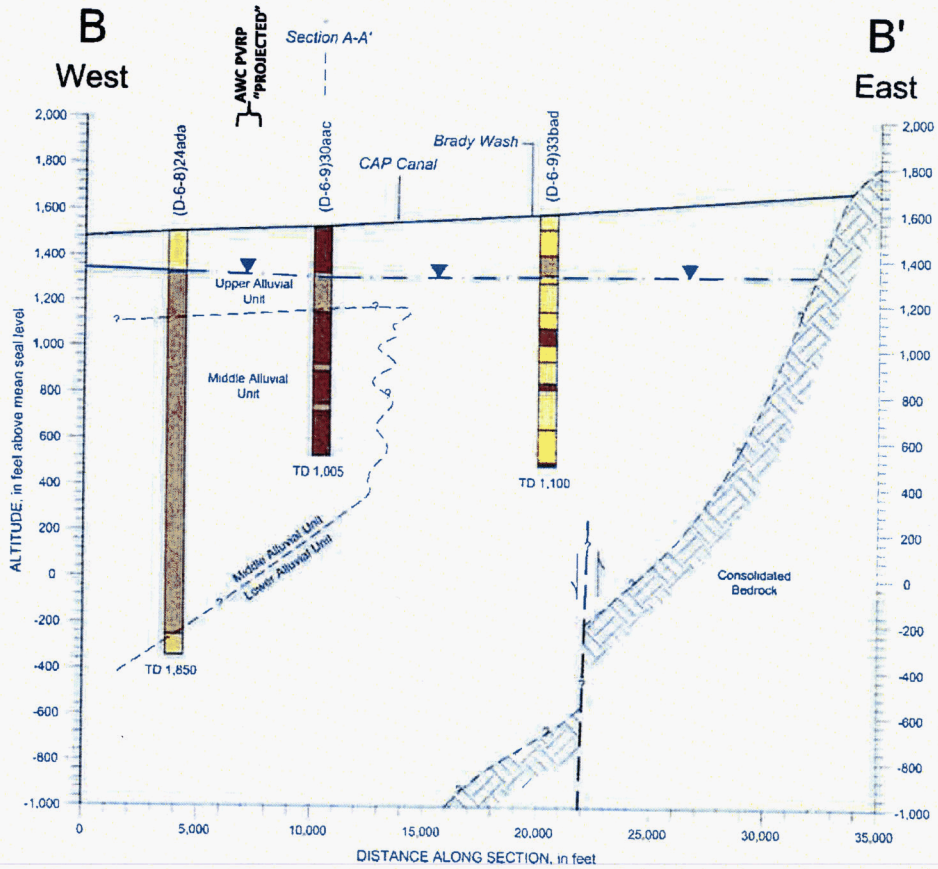
FAULT - approximately located

APPROXIMATE GROUNDWATER LEVEL, Winter 2005/2007 (GWSI Database)

Data Source: Montgomery & Associates, Inc. Feb. 23, 2009 Recovery Wellfield Siting Study Phase 1 Pinal County, Arizona. Prepared for Central Arizona Project; Figure 8 Hydrogeologic Sections A-A' and B-B'

CLEAR CREEK ASSOCIATES

FIGURE 6a
HYDROGEOLOGIC SECTION A-A'



EXPLANATION

GENERALIZED LITHOLOGIC CLASSIFICATION OF MATERIALS AS SHOWN ON GRAPHIC LOGS

- SAND AND GRAVEL; nonlithified; estimated LARGE PERMEABILITY.
- SILTY OR CLAYEY SAND; SILTY OR CLAYEY GRAVEL, FINE SAND; may be weakly lithified; estimated MODERATELY LARGE PERMEABILITY.
- UNDIFFERENTIATED; includes drillers' log descriptions "conglomerate", "rock and conglomerate", "overburden", "sand/gravel and clay"; PERMEABILITY may be SMALL TO LARGE
- SANDY CLAY; MODERATELY-LITHIFIED COARSE-GRAINED SEDIMENTS; estimated SMALL PERMEABILITY.
- CLAY AND SILTY CLAY; LITHIFIED SEDIMENTS; estimated VERY SMALL PERMEABILITY.

TD 1,100 TOTAL DEPTH, in feet below land surface

HYDROGEOLOGIC CONTACT - dashed where approximate; queried where uncertain

FAULT - approximately located

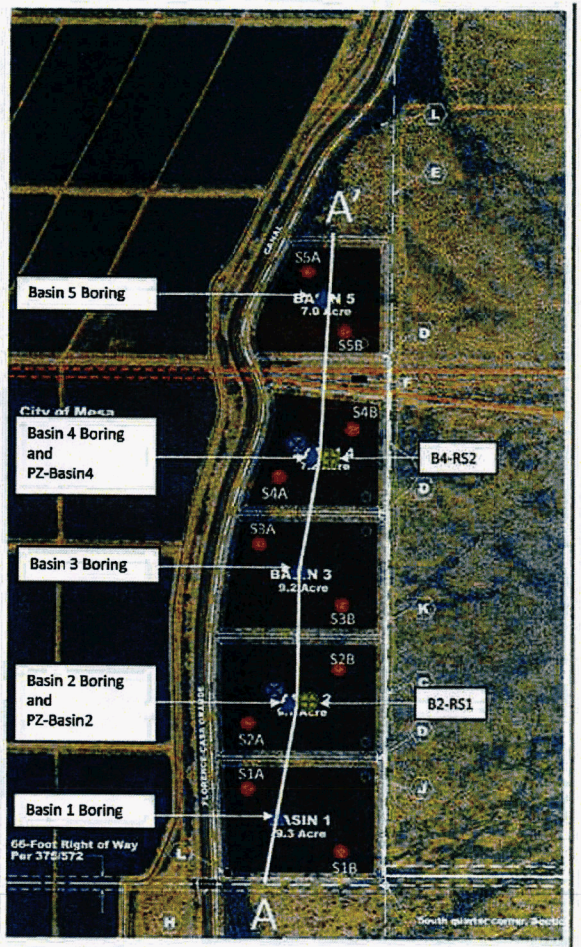
APPROXIMATE GROUNDWATER LEVEL, Winter 2005/2007 (GWSI Database)

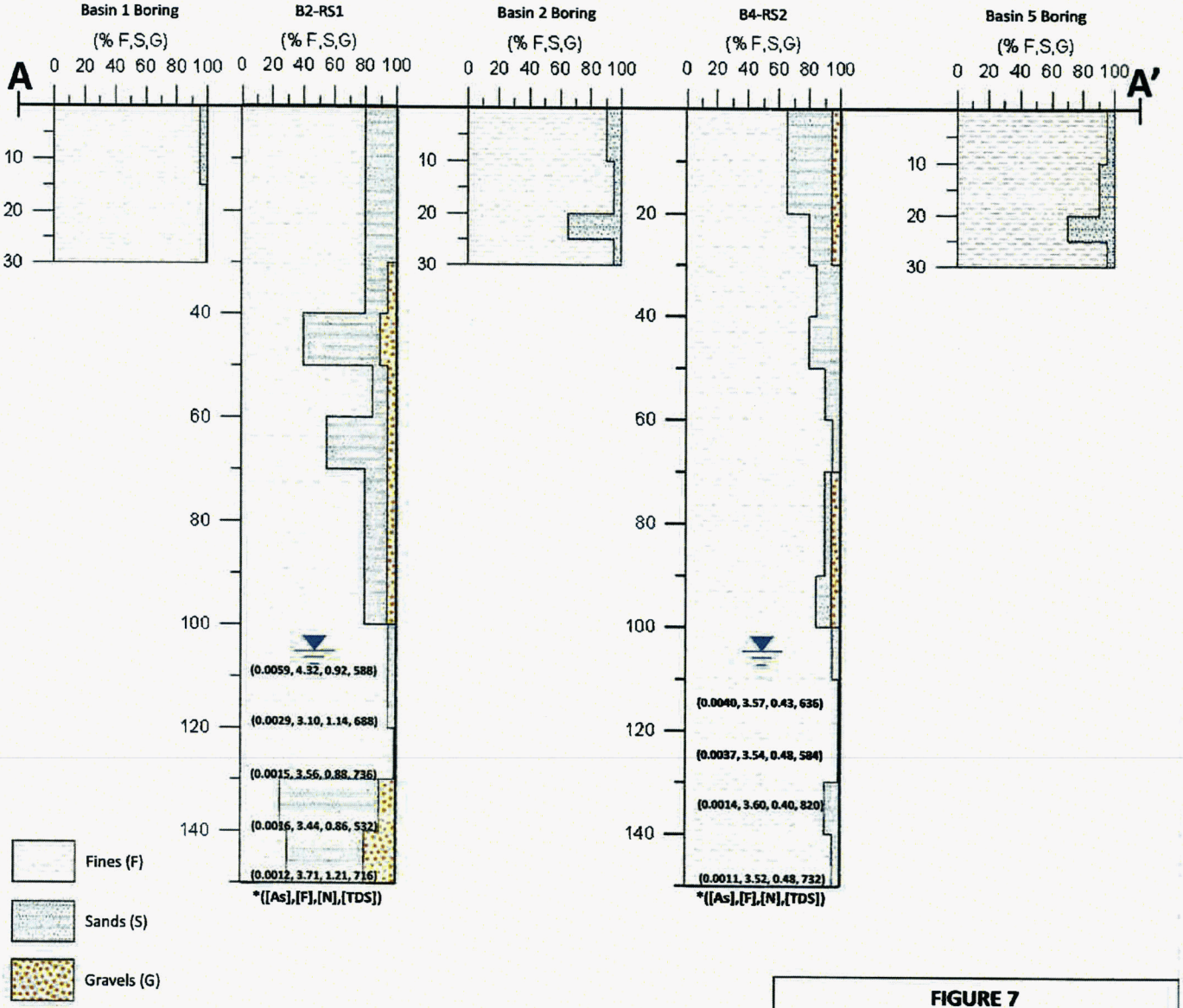
0 4,000 8,000
HORIZONTAL SCALE, IN FEET
VERTICAL EXAGGERATION 1:10

Data Source: Montgomery & Associates, Inc. Feb. 23, 2009 Recovery Wellfield Siting Study Phase 1 Pinal County, Arizona. Prepared for Central Arizona Project; Figure 8 Hydrogeologic Sections A-A' and B-B'

CLEAR CREEK ASSOCIATES

FIGURE 6b
HYDROGEOLOGIC SECTION B-B'





N

APPROXIMATE SCALE
600 FEET

EXPLANATION

- Surface Soil Samples
- Shallow Borings B-1 thru B-5
- Temporary Piezometer Well
- Deep Continuous Core/ Water sampling

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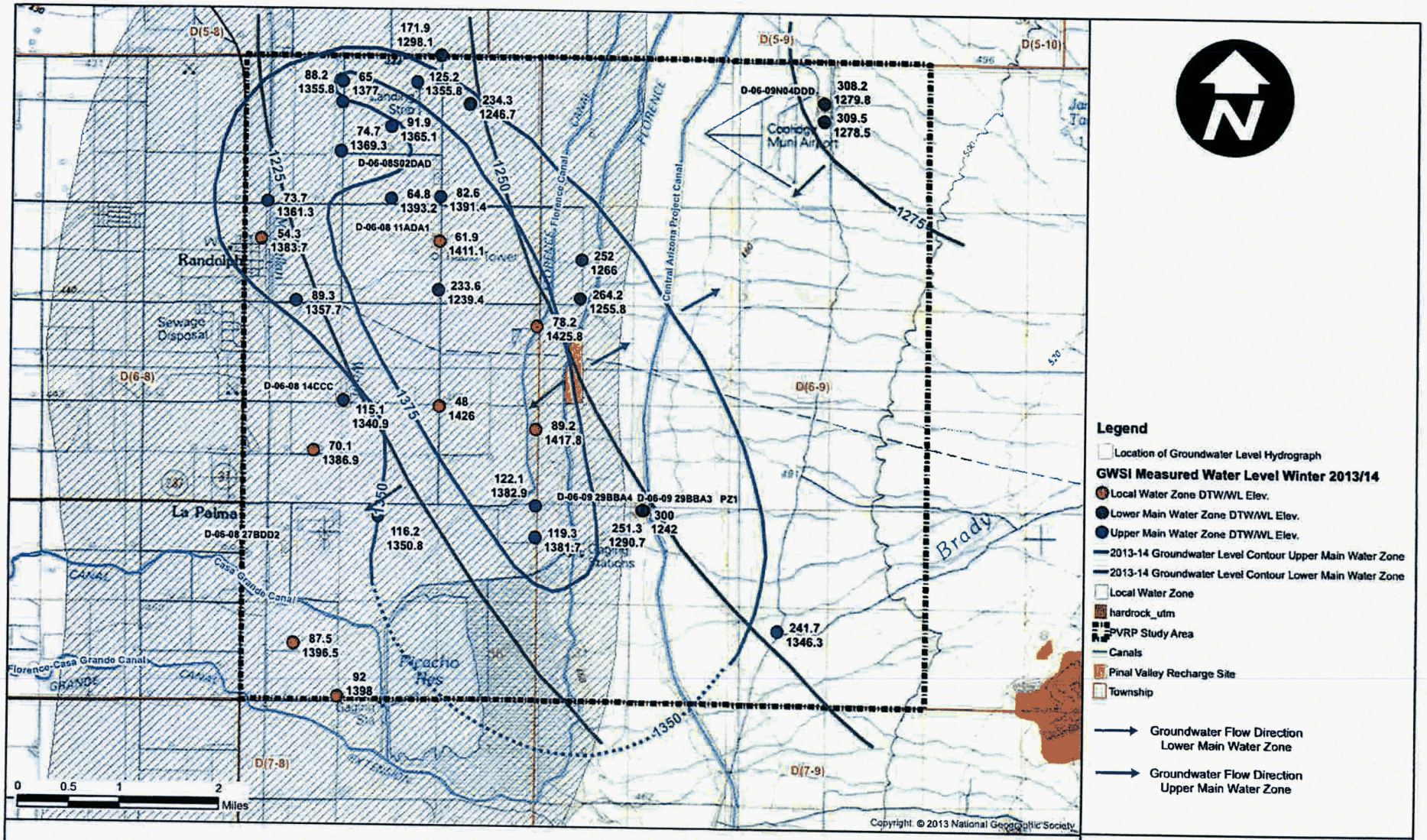
***Note:** Concentrations reported in mg/L

FIGURE 7
LITHOLOGIC CROSS-SECTION AT BASINS
AWC Pinal Valley Recharge Project



GROUNDWATER LEVELS WINTER 2013/14
Arizona Water Company Pinal Valley Recharge Project

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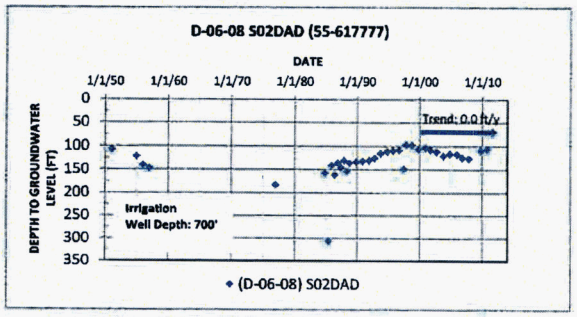
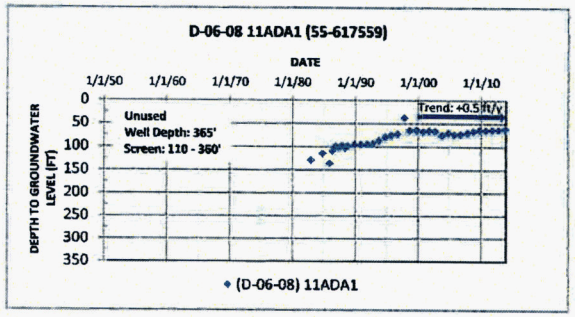
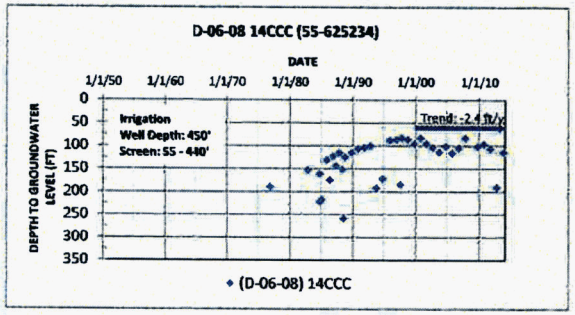
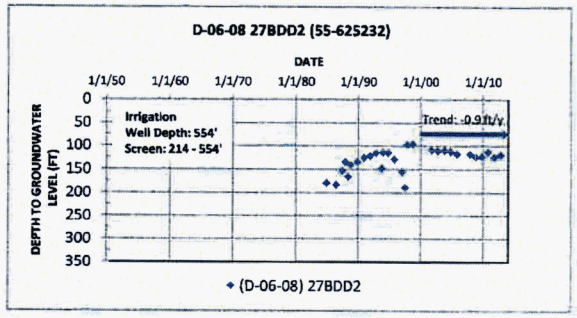
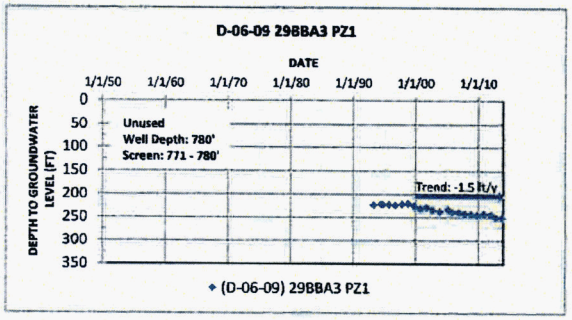
FIGURE 8

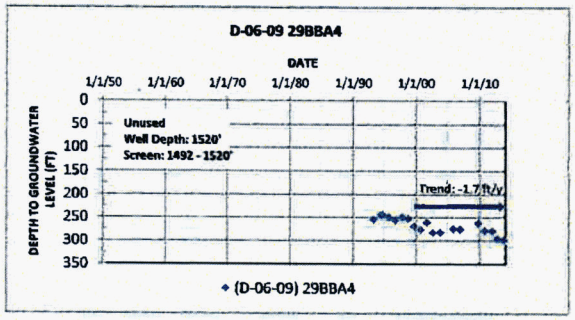












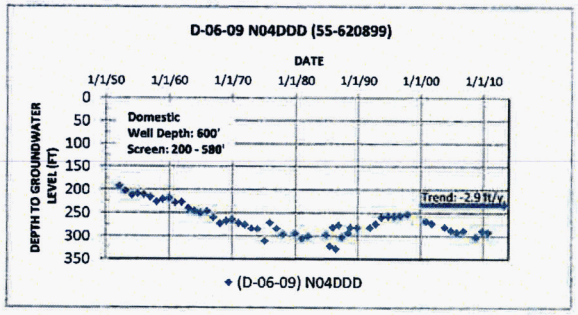


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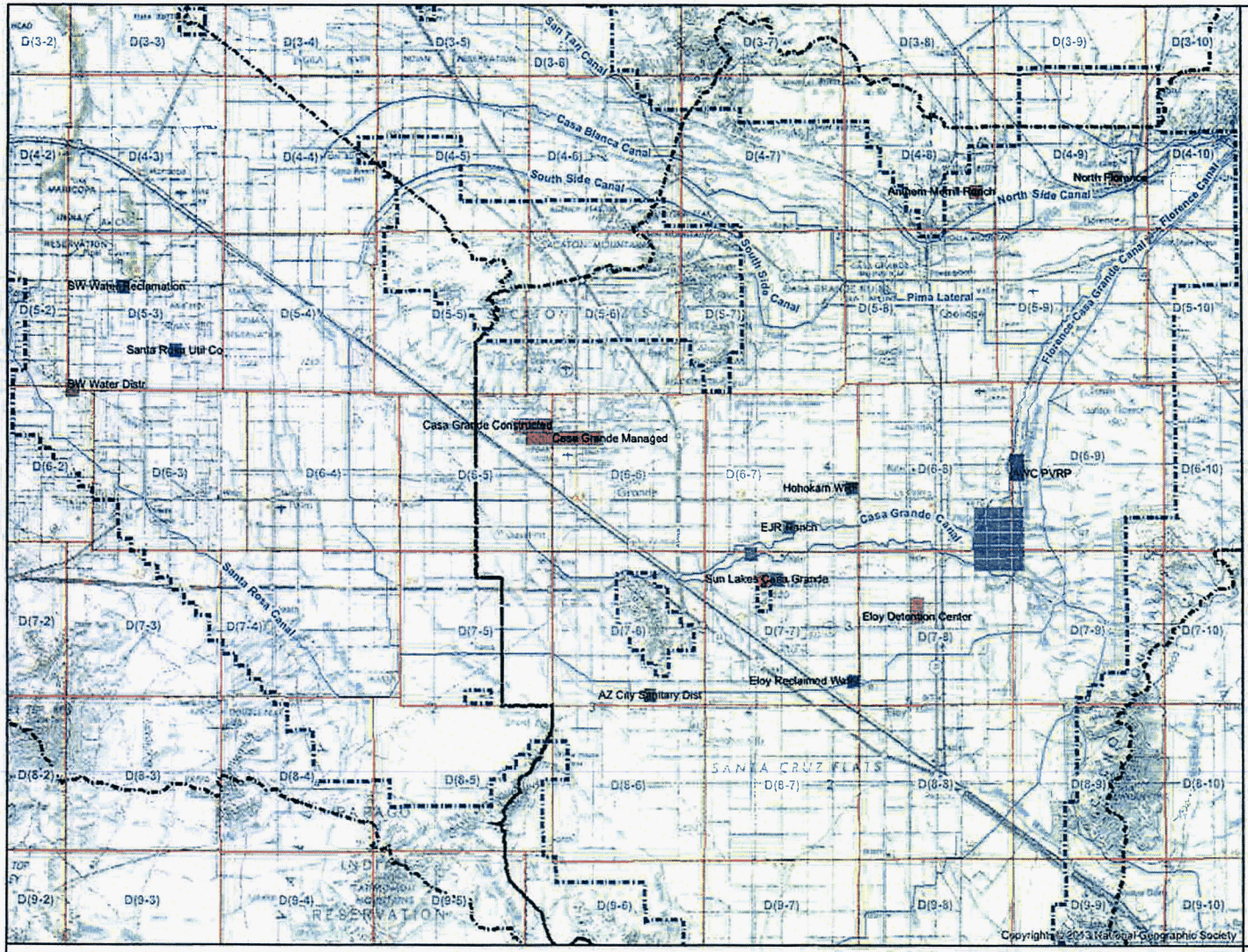
FIGURE 9
HYDROGRAPHS OF SELECTED WELLS NEAR PVRP



Legend

PVRP Model USF Recharge Locations

- AWC PVRP
- AZ City Sanitary Dist
- Anthem Merrill Ranch
- Casa Grande Constructed
- Casa Grande Managed
- EJR Ranch
- Eloy Detention Center
- Eloy Reclaimed Water
- Hohokam WRF
- North Florence
- SW Water Distr
- SW Water Reclamation
- Santa Rosa Util Co
- Sun Lakes Casa Grande
- PM_Grid_ActiveFootprint
- Picacho Reservoir Recharge Cells
- Mountain Front Recharge Cells
- ADWR Sub-basin Boundary
- Township
- Canals

0 0.5 1 2 3 4 5 6 7 8 9 10 Miles

PINAL AMA MODEL SIMULATED USFs

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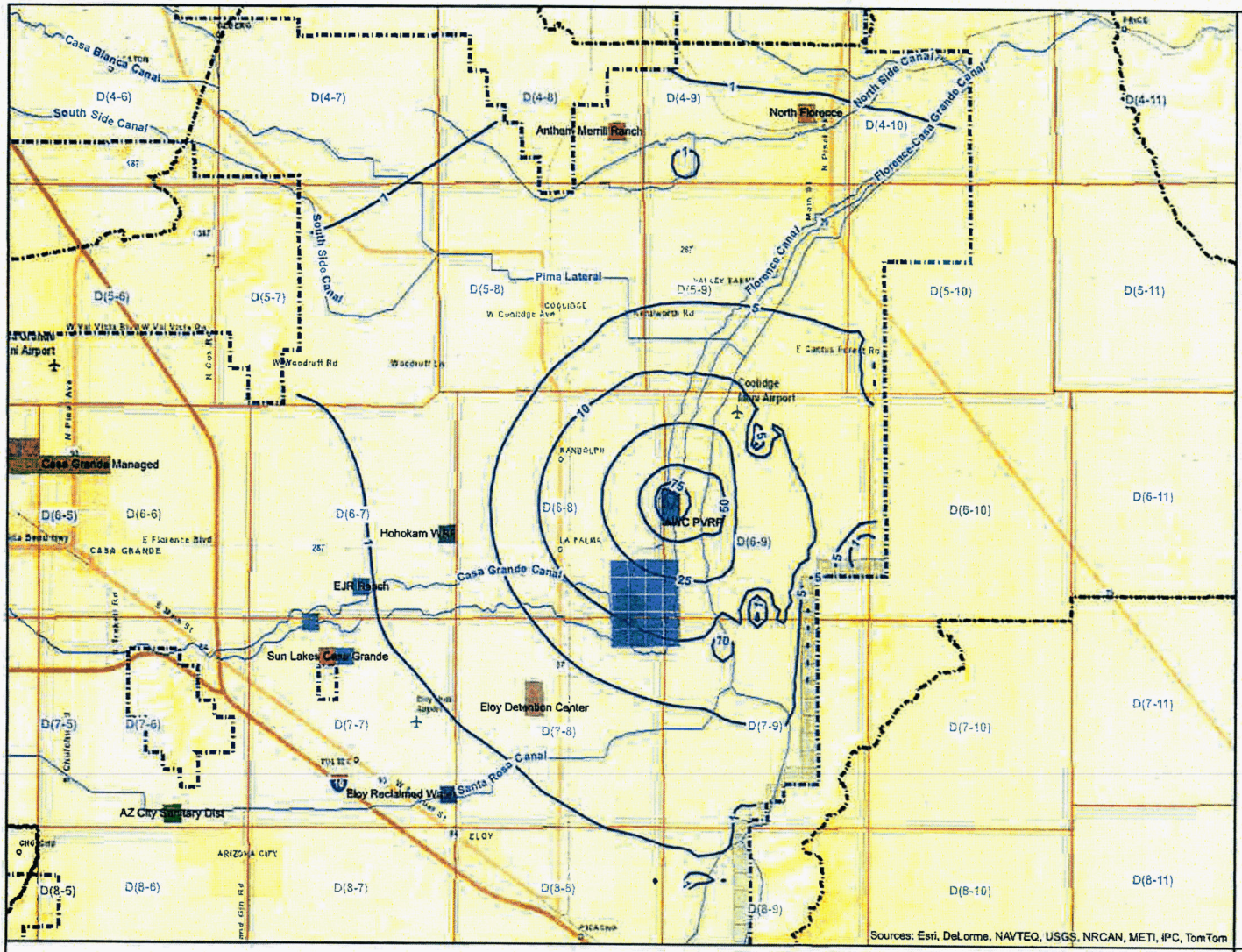
Figure 10



Legend

- AWC Pinal Valley Recharge Project AOHI

PVRP Model USF Recharge Locations

- AWC PVRP
- AZ City Sanitary Dist
- Anthem Merrill Ranch
- Casa Grande Constructed
- Casa Grande Managed
- EJR Ranch
- Eloy Detention Center
- Eloy Reclaimed Water
- Hohokam WRF
- North Florence
- SW Water Distr
- SW Water Reclamation
- Santa Rosa Util Co
- Sun Lakes Casa Grande
- PM_Grid_ActiveFootprint
- Picacho Reservoir Recharge Cells
- Mountain Front Recharge Cells
- ADWR Sub-basin Boundary
- Township
- Canals
- World Street Map

0 0.5 1 2 3 4 5 6 7 Miles

AWC PVRP AREA OF HYDROLOGIC IMPACT

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Figure 12

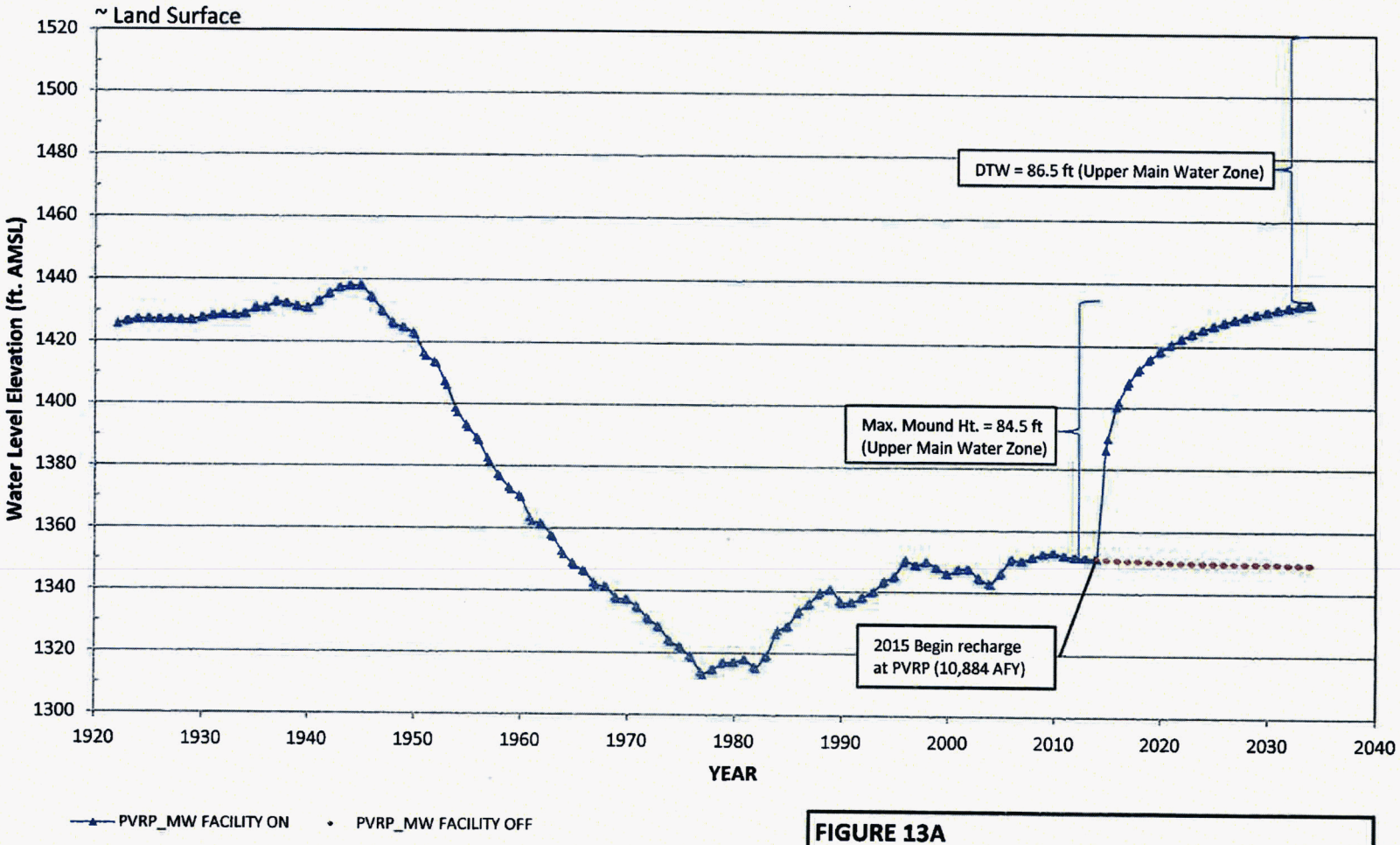
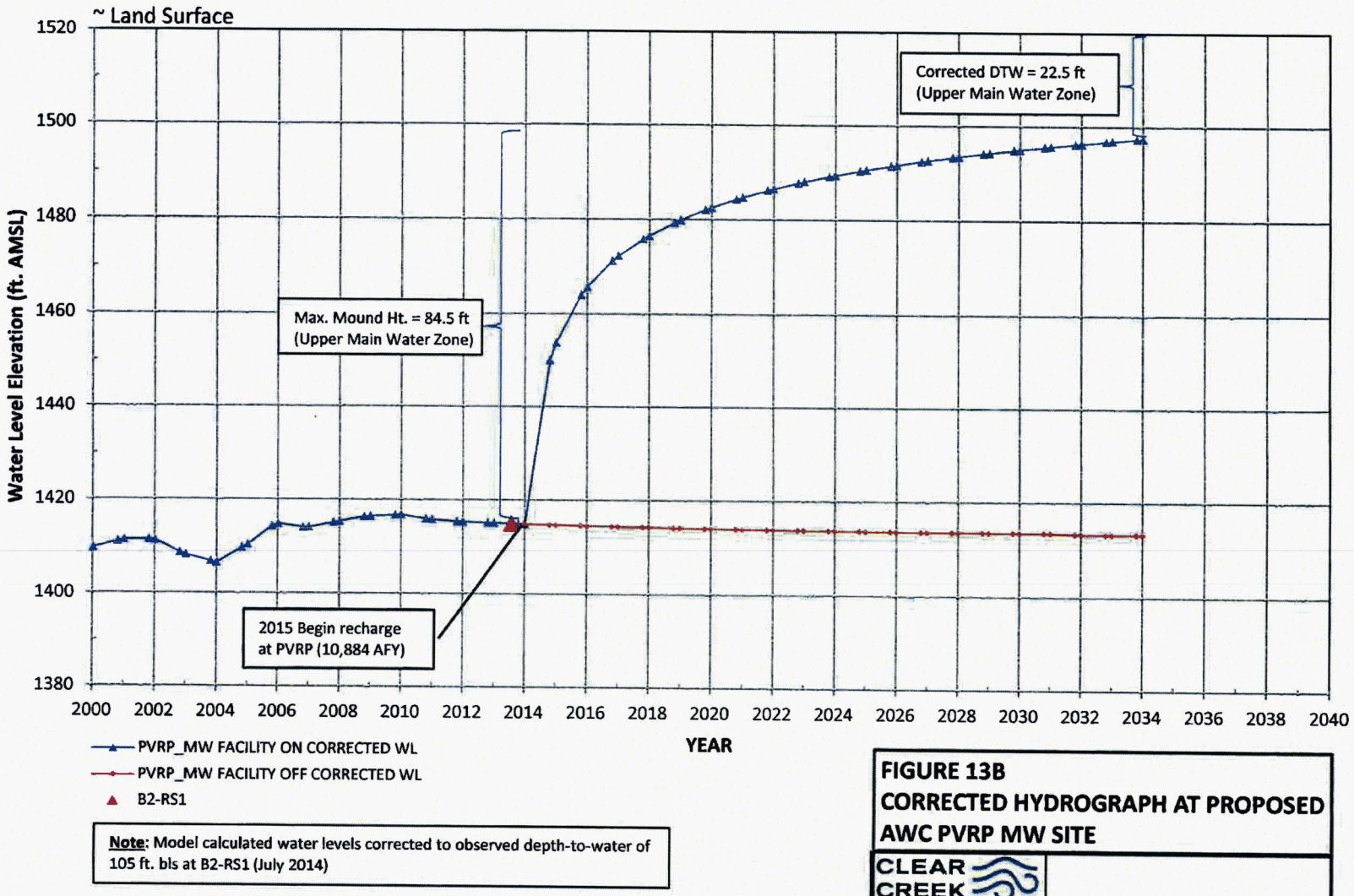


FIGURE 13A
HYDROGRAPH AT PROPOSED AWC PVRP MW SITE

CLEAR CREEK ASSOCIATES



Note: Model calculated water levels corrected to observed depth-to-water of 105 ft. bls at B2-RS1 (July 2014)

FIGURE 13B
CORRECTED HYDROGRAPH AT PROPOSED AWC PVRP MW SITE

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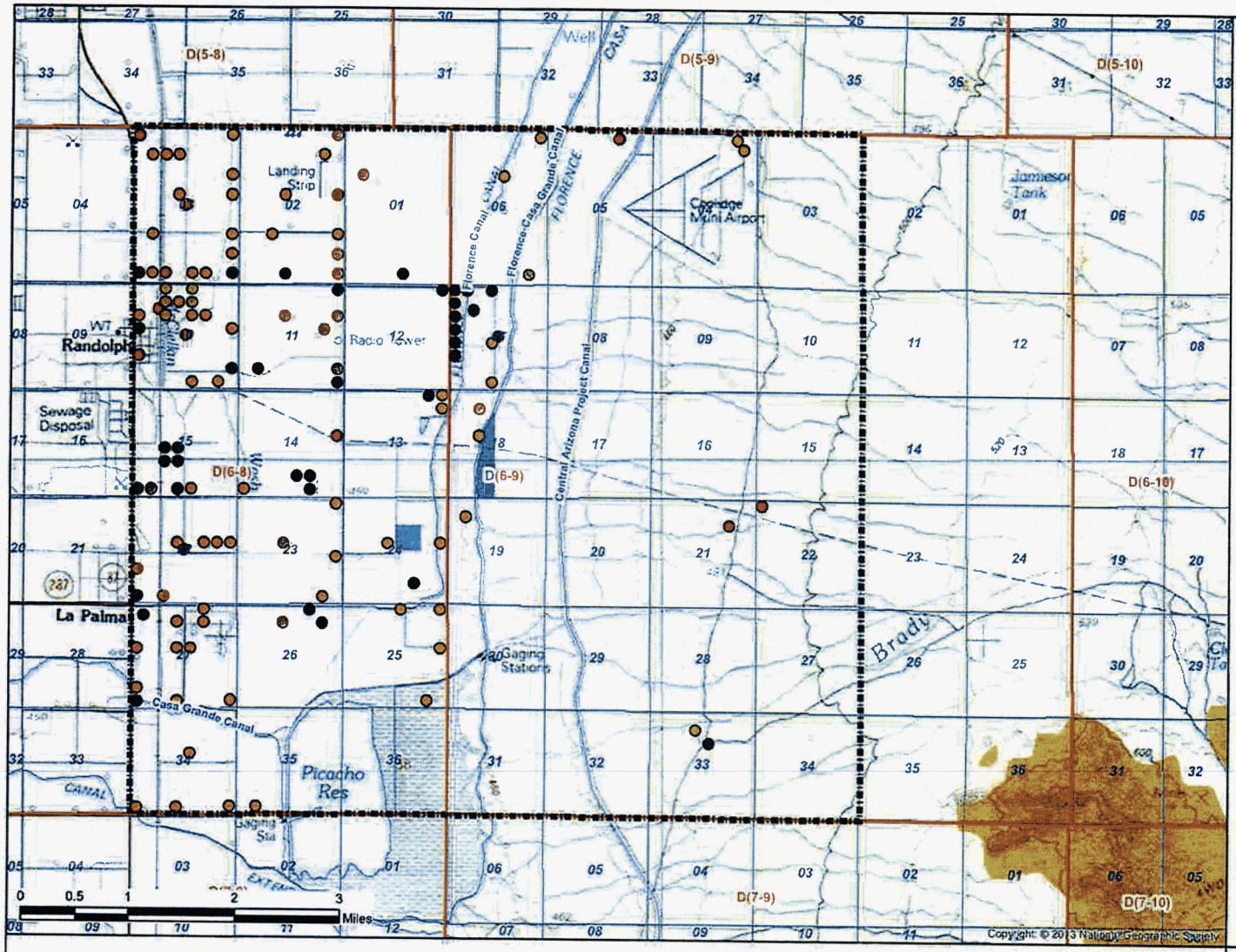

Legend

ADWR Wells-55 Inventory

- EXEMPT
- MONITOR
- NON-EXEMPT
- OTHER
- Pinal Valley Recharge Site
- Proposed CAP HIDD Recharge Site
- Bedrock
- PVRP_Study_Area
- Township
- Section
- Canals

ADWR 55-WELL REGISTRY WELL LOCATIONS
Arizona Water Company Pinal Valley Recharge Project

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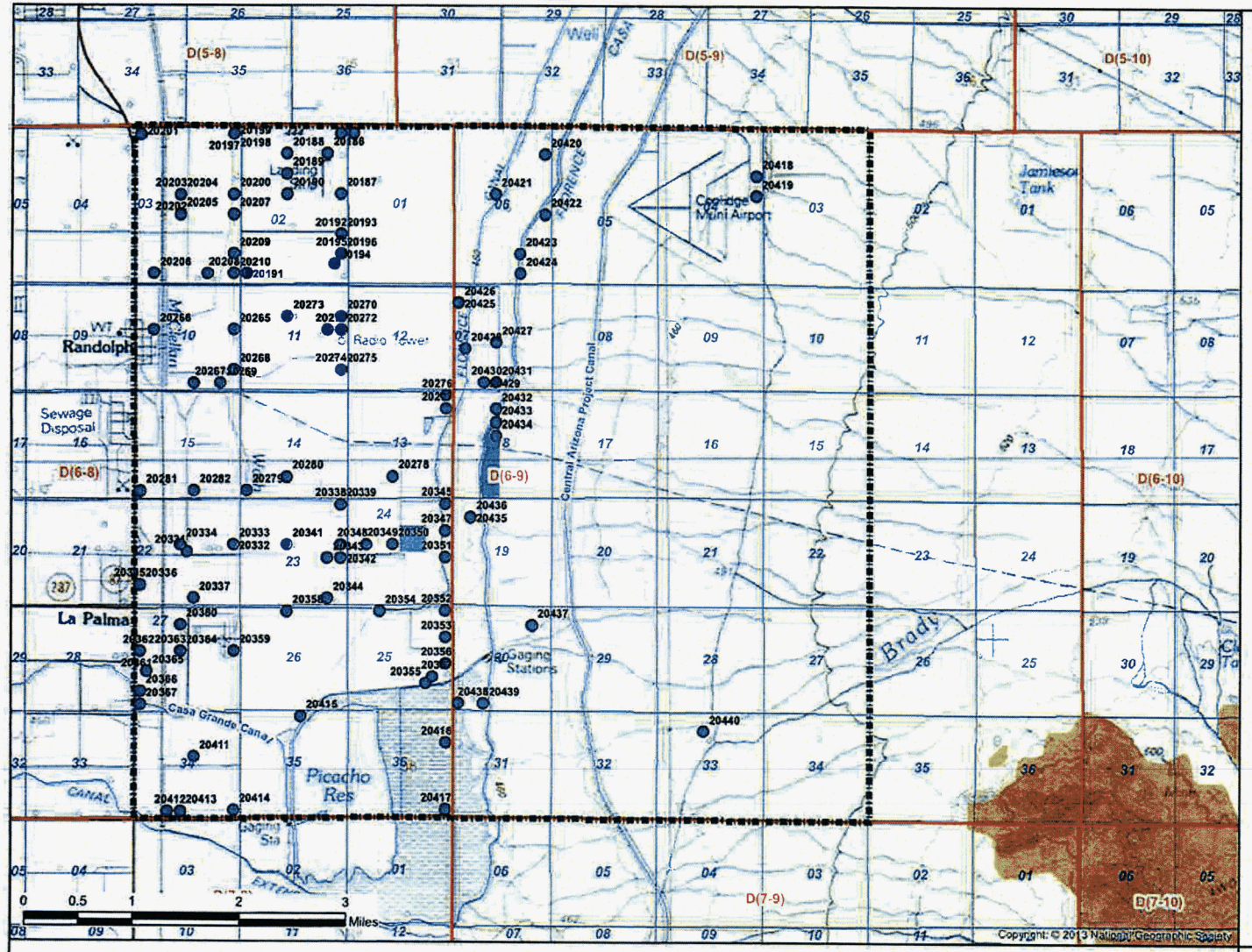
FIGURE 14



Legend

ADWR 35-Wells Registry Inventory

- ADWR Wells 35 ID No.
- Pinal Valley Recharge Site
- Proposed CAP HIDD Recharge Site
- Bedrock
- PVRP_Study_Area
- Township
- Section
- Canals

ADWR 35-WELL REGISTRY WELL LOCATIONS
Arizona Water Company Pinal Valley Recharge Project

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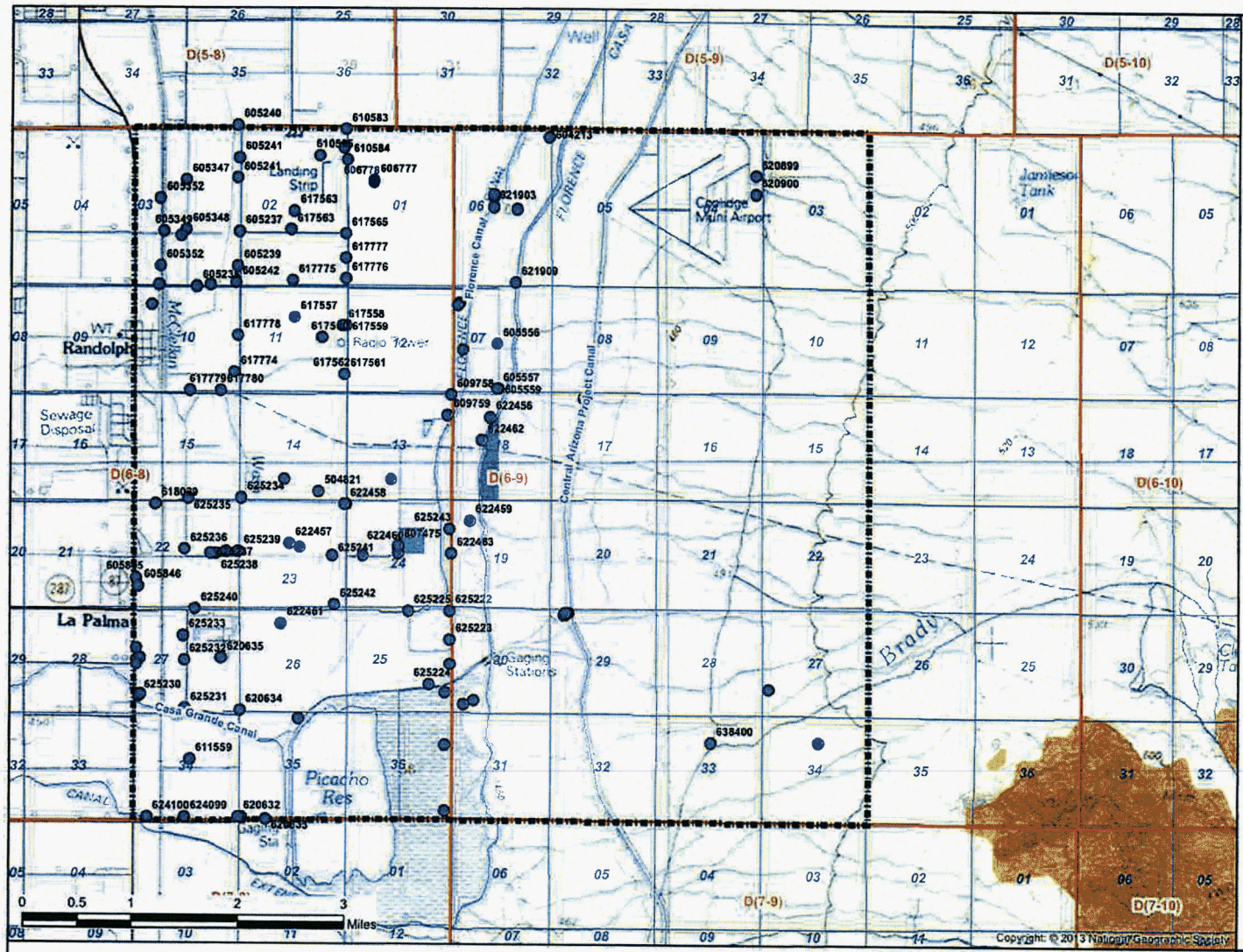
FIGURE 15



Legend

- ADWR GWSI Wells in Study Area
- Pinal Valley Recharge Site
- Proposed CAP HIDD Recharge Site
- Bedrock
- PVRP_Study_Area
- Township
- Section
- Canals

ADWR GWSI WELL LOCATIONS
Arizona Water Company Pinal Valley Recharge Project

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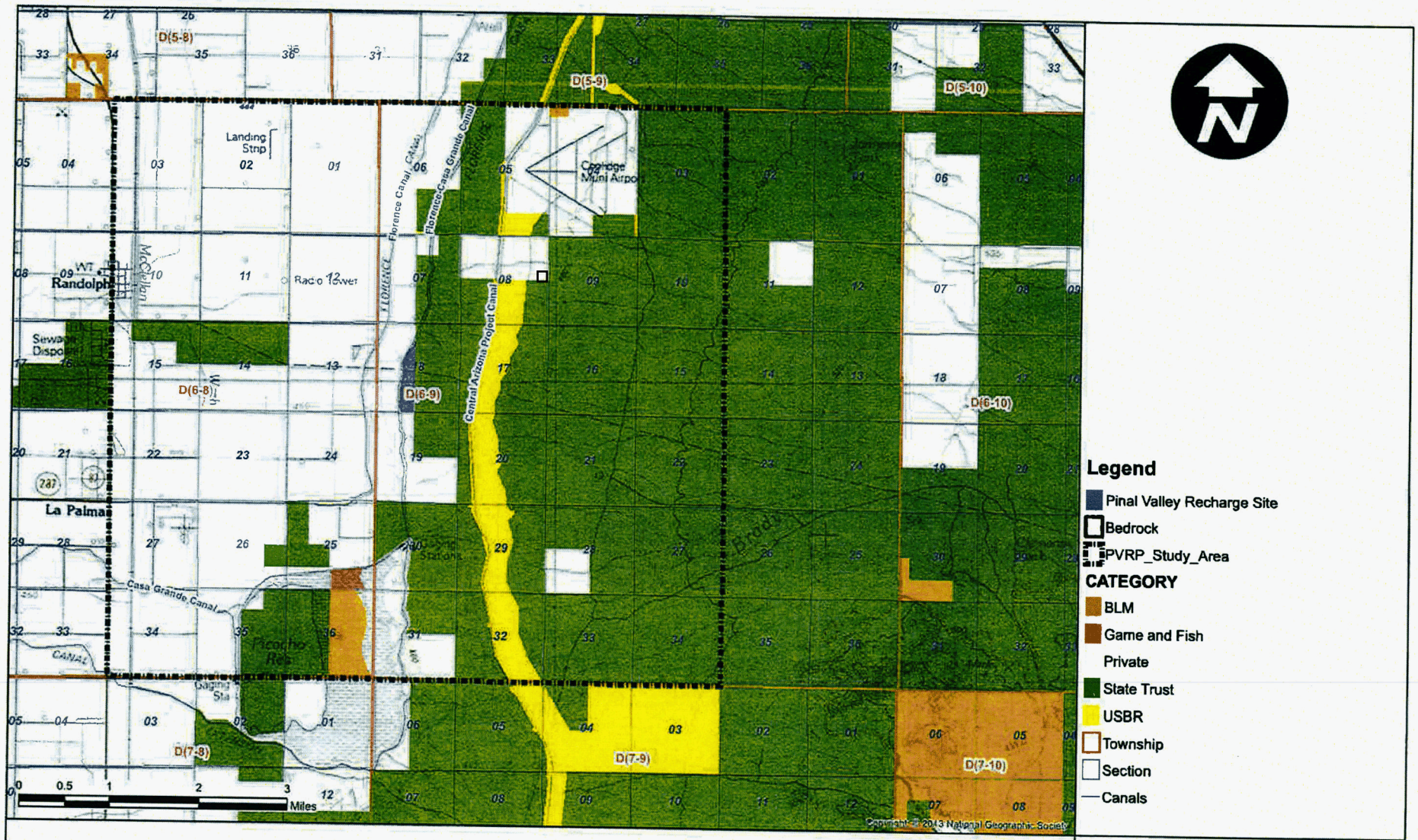
Revision: 1

FIGURE 16



GENERAL LAND OWNERSHIP
Arizona Water Company Pinal Valley Recharge Project

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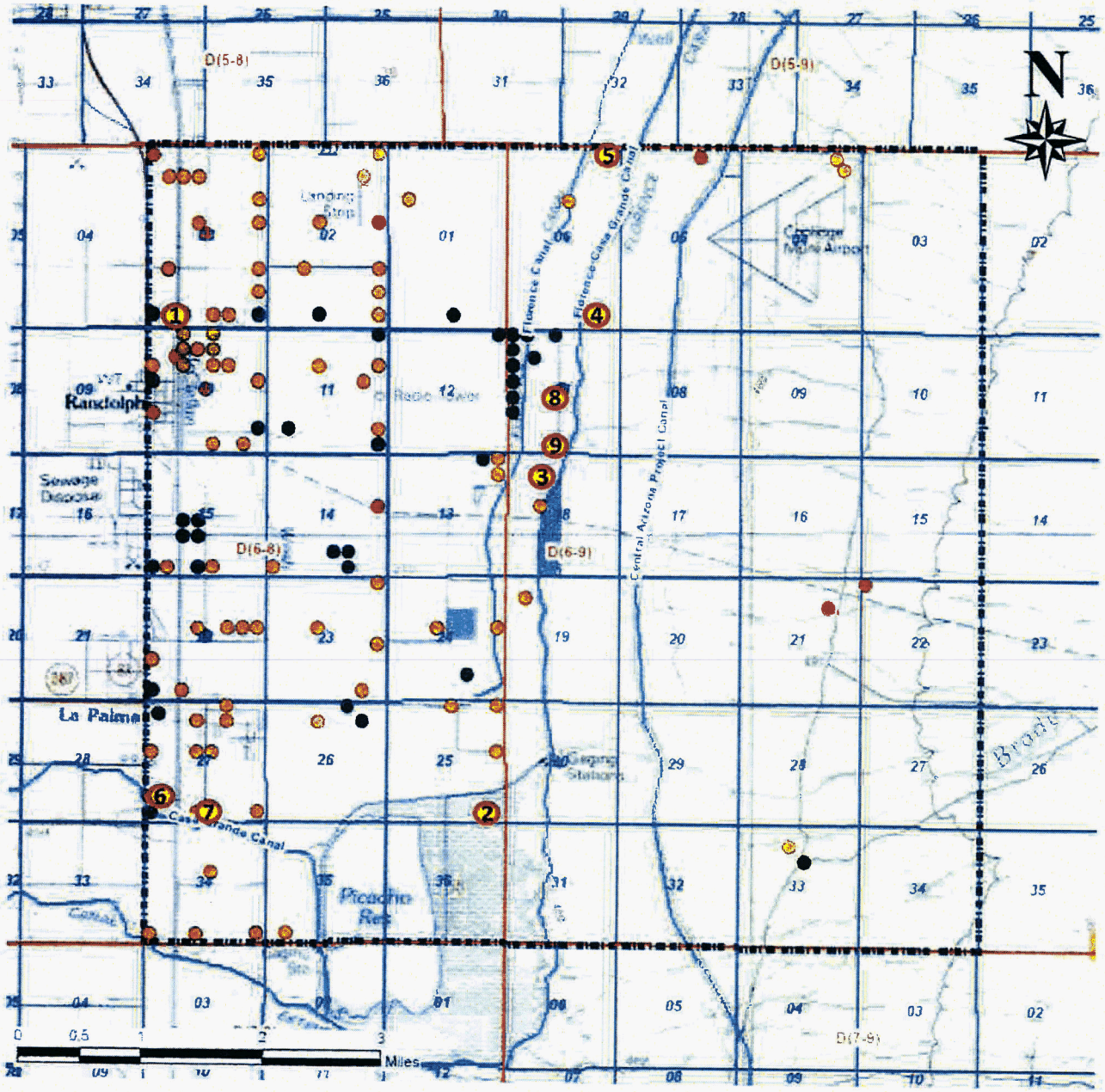
Drafted: swc
Revision: 1

FIGURE 17



Explanation:

- Groundwater Sample I.D. and Location
- Non-exempt Well
- Exempt Well
- Other Well

TABLE: Well Information

Sample ID	Well 55 ID #	Well Depth (feet)	Casing Diameter (in)	Pumping (GPM)
1	605353	500	20	600
2	625224	600	16	1000
3	622456	1420	20	1800
4	621909	1020	20	1200
5	222563	1000	16	2000
6	625230	500	16	600
7	625231	414	12	700
8	221958	1200	16	2500
9	605559	1600	20	2000

FIGURE 18
SAMPLED PRODUCTION WELLS
September 18, 2014
AWC Pinal Valley Recharge Project

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TABLES

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 10ADD	325458111295101	617778	11/8/84 0:00	102.20	1347.80		STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	6/18/85 0:00	127.30	1323.00	PUMPING	STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	11/1/88 0:00	93.60	1356.40		STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	11/2/93 0:00	83.00	1367.00		STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	7/23/97 0:00	96.10	1354.00	PUMPING	STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	11/4/98 0:00	59.30	1391.00		STANDARD	453418.084	3642104.015
D-06-08 10ADD	325458111295101	617778	11/20/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	453418.084	3642104.015
D-06-08 10BCA	325458111304001		11/6/84 0:00	144.00	1294.00		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		8/29/88 0:00	242.40	1196.00	PUMPING	STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		11/8/88 0:00	108.70	1329.30		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		11/12/93 0:00	83.70	1354.30		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		11/11/98 0:00	60.60	1377.00		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		11/19/03 0:00	70.90	1367.10		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		12/5/07 0:00	62.80	1375.20		STANDARD	452130.529	3642276.448
D-06-08 10BCA	325458111304001		12/18/13 0:00	54.30	1383.70		STANDARD	452130.529	3642276.448
D-06-08 10DCC	325429111301901	617779	11/12/93 0:00	84.80	1362.20		STANDARD	452697.146	3641269.873
D-06-08 10DCC	325429111301901	617779	11/11/98 0:00	75.40	1372.00		STANDARD	452697.146	3641269.873
D-06-08 10DCC	325429111301901	617779	12/3/03 0:00	95.50	1351.50		STANDARD	452697.146	3641269.873
D-06-08 10DCC	325429111301901	617779	12/5/07 0:00	95.00	1352.00		STANDARD	452697.146	3641269.873
D-06-08 10DCC	325429111301901	617779	12/18/13 0:00	89.30	1357.70		STANDARD	452697.146	3641269.873
D-06-08 10DDA	325440111295301	617774	2/16/54 0:00	107.10	1342.90		STANDARD	453363.478	3641549.965
D-06-08 10DDA	325440111295301	617774	1/17/55 0:00	106.79	1343.21		STANDARD	453363.478	3641549.965
D-06-08 10DDA	325440111295301	617774	1/19/56 0:00	93.70	1356.30		STANDARD	453363.478	3641549.965
D-06-08 10DDA	325440111295301	617774	1/15/57 0:00	109.44	1340.56		STANDARD	453363.478	3641549.965
D-06-08 10DDA	325440111295301	617774	1/13/58 0:00	121.50	1328.50		STANDARD	453363.478	3641549.965
D-06-08 10DDA	325440111295301	617774	1/10/94 0:00	74.70	1375.30		STANDARD	453363.478	3641549.965
D-06-08 10DDC	325431111300101	617780	7/28/97 0:00	173.30	1275.00	PUMPING	STANDARD	453162.217	3641270.657
D-06-08 10DDC	325431111300101	617780	11/4/98 0:00	75.80	1372.00		STANDARD	453162.217	3641270.657
D-06-08 10DDC	325431111300101	617780	11/11/98 0:00	73.10	1375.00		STANDARD	453162.217	3641270.657
D-06-08 10DDC	325431111300101	617780	12/3/03 0:00	67.60	1380.40		STANDARD	453162.217	3641270.657
D-06-08 10DDC	325431111300101	617780	12/18/13 0:00	0.00	0.00	WELL DESTROYED	STANDARD	453162.217	3641270.657
D-06-08 11ACB	325507111291801	617557	11/8/84 0:00	152.80	1306.20		STANDARD	454276.560	3642377.169
D-06-08 11ACB	325507111291801	617557	11/1/88 0:00	128.60	1330.40		STANDARD	454276.560	3642377.169
D-06-08 11ACB	325507111291801	617557	6/26/91 0:00	229.60	1229.00	PUMPING	STANDARD	454276.560	3642377.169
D-06-08 11ACB	325507111291801	617557	11/2/93 0:00	105.50	1353.50		STANDARD	454276.560	3642377.169
D-06-08 11ACB	325507111291801	617557	11/4/98 0:00	91.50	1368.00		STANDARD	454276.560	3642377.169
D-06-08 11ACB	325507111291801	617557	11/20/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	454276.560	3642377.169
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	12/18/85 0:00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
[illegible]	[illegible]	617559	6/10/88 0:00	109.00	1363.50	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/19/89 0:00	99.00	1373.50	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	6/16/87 0:00	102.30	1370.70	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/23/87 0:00	97.80	1375.20	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	6/7/88 0:00	102.80	1370.20	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/1/88 0:00	99.30	1373.70	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/4/89 0:00	96.10	1376.90	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	10/10/90 0:00	96.20	1376.80	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/16/91 0:00	95.80	1377.20	[illegible]	INDEX	[illegible]	3642235.077
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[illegible]	[illegible]	617559	11/2/93 0:00	87.50	1385.50	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	10/5/94 0:00	80.00	1393.00	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/1/95 0:00	76.20	1396.80	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	10/29/96 0:00	73.00	1400.00	[illegible]	INDEX	[illegible]	3642235.077
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[illegible]	[illegible]	617559	11/11/99 0:00	64.60	1408.40	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/8/00 0:00	68.30	1404.70	[illegible]	INDEX	[illegible]	3642235.077
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[illegible]	[illegible]	617559	12/3/07 0:00	70.50	1402.50	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/19/08 0:00	67.50	1405.50	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/18/09 0:00	64.20	1408.80	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/8/10 0:00	65.40	1407.60	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/2/11 0:00	63.90	1409.10	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	11/14/12 0:00	64.10	1408.90	[illegible]	INDEX	[illegible]	3642235.077
[illegible]	[illegible]	617559	12/3/13 0:00	61.90	1411.10	[illegible]	INDEX	[illegible]	3642235.077
D-06-08 11ADC	325500111285901	617560	11/8/84 0:00	169.50	1299.00		STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	11/1/88 0:00	143.30	1324.70		STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	6/26/91 0:00	245.90	1222.00	PUMPING	STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	11/2/93 0:00	117.50	1350.50		STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	7/24/97 0:00	268.00	1200.00	PUMPING	STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	11/4/98 0:00	105.60	1362.40	UNDETERMINED	STANDARD	454690.689	3642067.294
D-06-08 11ADC	325500111285901	617560	11/20/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	454690.689	3642067.294
D-06-08 11DDD	325439111284901	617562	7/21/75 0:00	361.00	1112.00	PUMPING	STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	6/26/91 0:00	448.00	1025.00	PUMPING	STANDARD	455025.506	3641440.624

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 11DDD	325439111284901	617562	11/2/93 0:00	172.80	1300.20		STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	7/24/97 0:00	459.40	1014.00	PUMPING	STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	11/4/98 0:00	197.20	1276.00		STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	12/1/03 0:00	217.00	1256.00		STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	12/3/07 0:00	224.60	1248.40	FOREIGN MATERIAL (OIL)	STANDARD	455025.506	3641440.624
D-06-08 11DDD	325439111284901	617562	12/4/13 0:00	233.60	1239.40		STANDARD	455025.506	3641440.624
D-06-08 13AAD	325419111274801	609759	3/1/51 0:00	80.00	1424.00		STANDARD	456641.188	3640863.713
D-06-08 13AAD	325419111274801	609759	11/3/98 0:00	79.60	1424.40		STANDARD	456641.188	3640863.713
D-06-08 13AAD	325419111274801	609759	12/1/03 0:00	80.00	1424.00		STANDARD	456641.188	3640863.713
D-06-08 13AAD	325419111274801	609759	12/3/07 0:00	73.80	1430.20		STANDARD	456641.188	3640863.713
D-06-08 13AAD	325419111274801	609759	12/4/13 0:00	78.20	1425.80		STANDARD	456641.188	3640863.713
D-06-08 13CDA	325348111282101		7/1/51 0:00	86.00	1401.00		STANDARD	455746.155	3639937.769
D-06-08 13CDA	325348111282101		2/19/53 0:00	86.79	1400.21		STANDARD	455746.155	3639937.769
D-06-08 13CDA	325348111282101		2/16/54 0:00	91.70	1395.30		STANDARD	455746.155	3639937.769
D-06-08 13CDA	325348111282101		1/18/55 0:00	108.05	1378.95		STANDARD	455746.155	3639937.769
D-06-08 13CDA	325348111282101		5/18/84 0:00	0.00	0.00	WELL DESTROYED	STANDARD	455746.155	3639937.769
D-06-08 14CCC	325342111294701	625234	1/18/77 0:00	190.30	1265.70		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	1/10/83 0:00	153.70	1302.30		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/8/84 0:00	223.00	1233.00	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/14/84 0:00	162.00	1294.00		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	2/28/85 0:00	218.00	1238.00	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/18/85 0:00	151.80	1324.20		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	6/10/86 0:00	176.20	1279.80		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/12/86 0:00	123.80	1332.20		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	6/18/87 0:00	143.90	1312.10		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/23/87 0:00	116.20	1339.80		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	6/7/88 0:00	152.40	1303.60		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	8/16/88 0:00	259.40	1196.60	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/1/88 0:00	129.00	1331.00		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/30/89 0:00	119.80	1340.20		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/10/90 0:00	107.70	1348.30		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/16/91 0:00	104.50	1351.50		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/20/92 0:00	100.80	1355.20		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/2/93 0:00	192.70	1263.30	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/9/94 0:00	173.00	1283.00	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/28/95 0:00	88.60	1367.40	CASCADING WATER	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	1/30/97 0:00	87.00	1369.00	CASCADING WATER	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	9/12/97 0:00	185.70	1270.30	PUMPING	INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	12/10/97 0:00	83.30	1372.70		INDEX	455471.490	3639661.713
D-06-08 14CCC	325342111294701	625234	11/3/98 0:00	86.70	1369.30	CASCADING WATER	INDEX	455471.490	3639661.713

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
[illegible]	[illegible]	625234	11/17/99 0:00	96.30	1359.70		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	12/5/00 0:00	84.00	1372.00		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/5/01 0:00	98.00	1360.00		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	10/29/02 0:00	104.80	1351.20		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/20/03 0:00	114.20	1341.80		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/24/04 0:00	101.90	1354.10		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/9/09 0:00	116.90	1339.10	CASCADING WATER	INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/21/06 0:00	106.00	1350.00	CASCADING WATER	INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	12/3/07 0:00	83.90	1372.10		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	12/18/08 0:00	102.80	1353.80		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/8/10 0:00	97.20	1358.80		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/8/11 0:00	107.20	1348.80		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	11/14/12 0:00	191.80	1264.20	PUMPING	INDEX	[illegible]	[illegible]
[illegible]	[illegible]	625234	12/3/13 0:00	115.10	1340.90		INDEX	[illegible]	[illegible]
D-06-08 14CDA	325348111292401		2/1/50 0:00	62.00	1400.00		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		2/19/53 0:00	85.78	1376.22		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		2/16/54 0:00	89.08	1372.92		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		1/18/55 0:00	107.23	1354.77		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		3/31/55 0:00	98.68	1363.32		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		6/29/55 0:00	101.42	1360.58		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		10/12/55 0:00	102.08	1359.92		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		1/19/56 0:00	100.21	1361.79		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		4/18/56 0:00	103.16	1358.84		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		7/11/56 0:00	111.70	1350.30		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		1/15/57 0:00	104.28	1357.72		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		1/13/58 0:00	109.49	1352.51		STANDARD	454109.396	3639945.206
D-06-08 14CDA	325348111292401		5/17/84 0:00	0.00	0.00	WELL DESTROYED	STANDARD	454109.396	3639945.206
D-06-08 14DCD1	325342111290401	504821	11/12/93 0:00	104.00	1364.00		STANDARD	454628.196	3639758.014
D-06-08 15DCC	325339111302001	625235	11/7/84 0:00	116.10	1336.90	PUMPING	STANDARD	452653.132	3639674.900
D-06-08 15DCC	325339111302001	625235	11/8/88 0:00	89.90	1363.10		STANDARD	452653.132	3639674.900
D-06-08 15DCC	325339111302001	625235	6/24/93 0:00	0.00	0.00	WELL DESTROYED	STANDARD	452653.132	3639674.900
D-06-08 22ACD	325311111300801	625237	11/8/84 0:00	103.70	1353.30		STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	2/26/85 0:00	120.30	1336.70	PUMPING	STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	11/8/88 0:00	92.80	1364.20		STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	11/12/93 0:00	79.70	1377.30		STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	11/12/98 0:00	60.10	1396.90	FOREIGN MATERIAL (OIL)	STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	11/20/03 0:00	66.90	1390.10		STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	12/18/07 0:00	69.40	1387.60		STANDARD	452984.456	3638854.170
D-06-08 22ACD	325311111300801	625237	12/18/13 0:00	70.10	1386.90		STANDARD	452984.456	3638854.170
D-06-08 22ADC	325311111300401	625238	11/8/84 0:00	99.60	1357.40		STANDARD	453062.375	3638853.801

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	SS-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 22ADC	325311111300401	625238	11/8/88 0:00	85.10	1371.90		STANDARD	453062.375	3638853.801
D-06-08 22ADC	325311111300401	625238	11/12/93 0:00	71.70	1385.30		STANDARD	453062.375	3638853.801
D-06-08 22ADC	325311111300401	625238	11/12/98 0:00	56.30	1401.00		STANDARD	453062.375	3638853.801
D-06-08 22ADC	325311111300401	625238	11/20/03 0:00	57.50	1399.50		STANDARD	453062.375	3638853.801
D-06-08 22ADC	325311111300401	625238	12/18/07 0:00	58.70	1398.30		STANDARD	453062.375	3638853.801
D-06-08 22ADD1	325313111295801		1/1/36 0:00	49.00	1411.00		STANDARD	453221.011	3638871.455
D-06-08 22ADD2	325313111295101	625239	11/14/84 0:00	151.30	1307.70		STANDARD	453402.851	3638870.599
D-06-08 22ADD2	325313111295101	625239	1/10/94 0:00	110.80	1348.20		STANDARD	453402.851	3638870.599
D-06-08 22BDD	325317111302801	625236	2/19/53 0:00	111.80	1346.20		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	2/16/54 0:00	122.20	1335.80		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	1/25/55 0:00	127.34	1330.66		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	1/19/56 0:00	136.71	1321.29		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	1/15/57 0:00	143.50	1314.50		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	1/13/58 0:00	152.20	1305.80		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	11/12/93 0:00	80.00	1378.00		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	11/12/98 0:00	62.90	1395.00		STANDARD	452597.563	3638911.443
D-06-08 22BDD	325317111302801	625236	11/20/03 0:00	61.70	1396.30		STANDARD	452597.563	3638911.443
D-06-08 22CCB1	325256111304801	605845	11/8/84 0:00	0.00	0.00	OBSTRUCTION	STANDARD	451870.435	3638462.189
D-06-08 22CCB1	325256111304801	605845	11/12/93 0:00	97.30	1365.70		STANDARD	451870.435	3638462.189
D-06-08 22CCB1	325256111304801	605845	11/13/98 0:00	81.80	1381.00		STANDARD	451870.435	3638462.189
D-06-08 22CCB1	325256111304801	605845	11/20/03 0:00	82.40	1380.60		STANDARD	451870.435	3638462.189
D-06-08 22CCB1	325256111304801	605845	3/14/06 0:00	85.00	1378.00		STANDARD	451870.435	3638462.189
D-06-08 22CCB1	325256111304801	605845	12/6/07 0:00	81.90	1381.10		STANDARD	451870.435	3638462.189
D-06-08 22CCB2	325256111304901	605846	11/8/84 0:00	174.30	1288.70		STANDARD	451893.297	3638354.321
D-06-08 22CCB2	325256111304901	605846	11/8/88 0:00	137.20	1325.80		STANDARD	451893.297	3638354.321
D-06-08 22CCB2	325256111304901	605846	11/12/93 0:00	108.50	1354.50		STANDARD	451893.297	3638354.321
D-06-08 22DCC	325249111300201	625240	11/8/84 0:00	105.00	1362.00		STANDARD	452749.199	3638011.526
D-06-08 23AAA1	325336111284801		9/12/51 0:00	80.00	1394.00		STANDARD	455043.007	3639571.321
D-06-08 23AAA2	325336111284901	622458	11/8/84 0:00	84.20	1389.80		STANDARD	455042.727	3639571.322
D-06-08 23AAA2	325336111284901	622458	11/1/88 0:00	90.60	1383.40		STANDARD	455042.727	3639571.322
D-06-08 23AAA2	325336111284901	622458	1/10/94 0:00	65.60	1408.40		STANDARD	455042.727	3639571.322
D-06-08 23AAA2	325336111284901	622458	11/3/98 0:00	52.80	1421.00		STANDARD	455042.727	3639571.322
D-06-08 23AAA2	325336111284901	622458	12/16/13 0:00	48.00	1426.00		STANDARD	455042.727	3639571.322
D-06-08 23DAB	325311111285601	625241	1/5/61 0:00	139.74	1332.26		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	1/16/62 0:00	169.00	1303.00	RECENTLY PUMPED	STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	1/28/63 0:00	182.12	1289.88		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	1/27/64 0:00	168.96	1303.04		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	12/23/64 0:00	168.45	1303.55		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	1/25/66 0:00	154.67	1317.33		STANDARD	454831.664	3638802.465

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 23DAB	325311111285601	625241	1/20/67 0:00	185.30	1286.70		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	11/14/84 0:00	181.40	1290.60		STANDARD	454831.664	3638802.465
D-06-08 23DAB	325311111285601	625241	11/20/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	454831.664	3638802.465
D-06-08 23DDD	325247111285501	625242	8/17/50 0:00	60.00	1413.00		STANDARD	454854.297	3638063.255
D-06-08 24ADA	325324111274701	625243	11/14/84 0:00	148.00	1359.00		STANDARD	456626.202	3639194.777
D-06-08 24ADA	325324111274701	625243	11/2/93 0:00	98.60	1408.40		STANDARD	456626.202	3639194.777
D-06-08 24ADA	325324111274701	625243	11/11/98 0:00	87.20	1419.80		STANDARD	456626.202	3639194.777
D-06-08 24ADA	325324111274701	625243	12/3/03 0:00	91.40	1415.60		STANDARD	456626.202	3639194.777
D-06-08 24ADA	325324111274701	625243	12/3/07 0:00	88.50	1418.50		STANDARD	456626.202	3639194.777
D-06-08 24ADA	325324111274701	625243	12/4/13 0:00	89.20	1417.80		STANDARD	456626.202	3639194.777
D-06-08 24BDD1	325316111281701	807475	3/10/42 0:00	50.00	1440.00		STANDARD	455845.668	3638951.887
D-06-08 24BDD1	325316111281701	807475	5/17/84 0:00	0.00	0.00	WELL DESTROYED	STANDARD	455845.668	3638951.887
D-06-08 24BDD2	325315111281701	622460	2/17/46 0:00	125.00	1365.00		STANDARD	455845.530	3638921.069
D-06-08 24BDD2	325315111281701	622460	5/17/84 0:00	0.00	0.00	WELL DESTROYED	STANDARD	455845.530	3638921.069
D-06-08 24BDD3	325315111281801		4/1/64 0:00	120.00	1370.00		STANDARD	455845.118	3638828.724
D-06-08 24BDD3	325315111281801		1/10/94 0:00	122.40	1367.60		STANDARD	455845.118	3638828.724
D-06-08 24CBA	325311111283801		11/14/84 0:00	111.00	1367.00		STANDARD	455299.363	3638800.347
D-06-08 24CBA	325311111283801		11/20/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	455299.363	3638800.347
D-06-08 25AAA	325243111275101	625222	3/4/85 0:00	248.70	1256.00	PUMPING	STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	7/7/87 0:00	258.70	1246.00	PUMPING	STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	11/2/93 0:00	113.20	1391.80		STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	9/17/97 0:00	190.00	1315.00	PUMPING	STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	11/3/98 0:00	93.30	1412.00		STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	11/20/03 0:00	102.20	1402.80		STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	12/3/07 0:00	0.00	0.00	PUMPING	STANDARD	456620.804	3637963.034
D-06-08 25AAA	325243111275101	625222	1/2/14 0:00	122.10	1382.90	CASCADING WATER	STANDARD	456620.804	3637963.034
D-06-08 25ABB	325245111281601	625225	1/17/77 0:00	193.70	1301.30		STANDARD	455997.215	3637965.778
D-06-08 25ADA	325030111275701	625223	3/10/42 0:00	42.81	1458.19		STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	11/2/88 0:00	136.00	1365.00		STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	11/9/93 0:00	125.40	1375.60		STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	9/17/97 0:00	190.00	1311.00	PUMPING	STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	11/12/98 0:00	99.60	1401.40		STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	11/29/07 0:00	130.80	1370.20		STANDARD	456613.405	3637448.787
D-06-08 25ADA	325030111275701	625223	12/4/13 0:00	119.30	1381.70		STANDARD	456613.405	3637448.787
D-06-08 25DAA	325218111274701		3/29/56 0:00	120.00	1383.00		STANDARD	456617.296	3637162.419
D-06-08 25DAC	325208111275801	625224	3/5/85 0:00	249.70	1255.30	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	7/7/87 0:00	248.70	1256.30	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	8/24/88 0:00	240.70	1264.30	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	11/2/88 0:00	155.00	1350.00		STANDARD	456304.117	3636855.712

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	SS-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 25DAC	325208111275801	625224	11/8/88 0:00	151.60	1353.40		STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	11/9/93 0:00	195.40	1309.60	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	9/18/97 0:00	190.20	1314.80	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	11/12/98 0:00	124.10	1380.90	CASCADING WATER	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	11/29/07 0:00	0.00	0.00	PUMPING	STANDARD	456304.117	3636855.712
D-06-08 25DAC	325208111275801	625224	1/1/14 0:00	0.00	0.00	OBSTRUCTION	STANDARD	456304.117	3636855.712
D-06-08 25DDA	325204111275001		9/11/41 0:00	44.95	1457.05		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		3/10/42 0:00	37.10	1464.90		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		1/1/48 0:00	40.00	1462.00		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		2/22/51 0:00	63.73	1438.27		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		2/5/52 0:00	71.18	1430.82		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		2/16/53 0:00	88.98	1413.02		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		2/16/54 0:00	99.53	1402.47		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		1/25/55 0:00	89.63	1412.37		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		1/16/56 0:00	90.64	1411.36		STANDARD	456537.472	3636731.634
D-06-08 25DDA	325204111275001		1/15/57 0:00	99.82	1402.18		STANDARD	456537.472	3636731.634
D-06-08 26BAD	325238111292601	622461	11/14/84 0:00	163.50	1303.50		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	11/1/88 0:00	136.40	1330.60		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	11/2/93 0:00	107.30	1359.70		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	7/24/97 0:00	171.90	1295.00	PUMPING	STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	11/3/98 0:00	96.90	1370.00		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	11/20/03 0:00	127.00	1340.00		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	12/3/07 0:00	121.00	1346.00		STANDARD	454047.385	3637789.806
D-06-08 26BAD	325238111292601	622461	12/16/13 0:00	116.20	1350.80		STANDARD	454047.385	3637789.806
D-06-08 27ADC	325221111295201	620635	1/10/94 0:00	116.40	1353.60		STANDARD	453156.336	3637242.660
D-06-08 27ADC	325221111295201	620635	11/5/98 0:00	100.10	1369.90		STANDARD	453156.336	3637242.660
D-06-08 27ADC	325221111295201	620635	12/17/13 0:00	0.00	0.00	OTHER	STANDARD	453156.336	3637242.660
D-06-08 27BCC1	325220111305001		5/8/44 0:00	70.00	1402.00		STANDARD	451861.901	3637245.862
D-06-08 27BCC2	325221111304801		12/1/51 0:00	130.00	1342.00		STANDARD	451914.067	3637276.429
D-06-08 27BCC3	325218111305001		11/13/84 0:00	147.30	1325.00		STANDARD	451861.602	3637184.336
D-06-08 27BCC3	325218111305001		10/31/88 0:00	124.20	1348.00		STANDARD	451861.602	3637184.336
D-06-08 27BCC3	325218111305001		11/1/93 0:00	104.10	1368.00		STANDARD	451861.602	3637184.336
D-06-08 27BDA	325232111302301	625233	11/14/84 0:00	105.70	1359.30		STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	11/8/88 0:00	93.90	1371.10		STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	7/29/97 0:00	91.20	1374.00	PUMPING	STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	11/13/98 0:00	67.00	1398.00		STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	11/19/99 0:00	72.10	1392.90		STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	12/7/00 0:00	69.30	1395.70		STANDARD	452565.331	3637612.085
D-06-08 27BDA	325232111302301	625233	11/6/01 0:00	0.00	0.00	WELL DESTROYED	STANDARD	452565.331	3637612.085

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 27BDD1	325226111305001		2/22/51 0:00	100.60	1371.40		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		2/5/52 0:00	112.90	1359.10		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		2/16/53 0:00	115.73	1356.27		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		2/17/54 0:00	128.24	1343.76		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		1/25/55 0:00	138.94	1333.06		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		1/19/56 0:00	141.12	1330.88		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		1/15/57 0:00	140.74	1331.26		STANDARD	451862.800	3637430.663
D-06-08 27BDD1	325226111305001		1/13/58 0:00	150.40	1321.60		STANDARD	451862.800	3637430.663
D-06-08 27BDD2	325226111302201	625232	11/13/84 0:00	179.70	1290.30		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	6/12/86 0:00	183.50	1286.50		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	6/16/87 0:00	154.30	1315.70		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/23/87 0:00	135.40	1334.60		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	6/2/88 0:00	166.20	1303.80		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	10/31/88 0:00	141.40	1328.60		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/30/89 0:00	135.40	1334.60		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/10/90 0:00	126.00	1344.00		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/15/91 0:00	122.30	1347.70		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/20/92 0:00	115.90	1354.10		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/1/93 0:00	149.20	1320.80	PUMPING	INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	1/10/94 0:00	114.60	1355.40		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/9/94 0:00	115.10	1354.90		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/2/95 0:00	129.10	1340.90		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	2/7/97 0:00	156.30	1313.70	PUMPING	INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	7/24/97 0:00	189.50	1280.50	PUMPING	INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/10/97 0:00	98.00	1372.00		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/5/98 0:00	97.00	1373.00		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/8/01 0:00	109.80	1360.20		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	10/29/02 0:00	111.40	1358.60		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/9/03 0:00	110.50	1359.50		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/24/04 0:00	112.80	1357.20		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/9/05 0:00	117.80	1352.20		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/20/06 0:00	0.00	0.00	PUMPING	INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/28/07 0:00	118.00	1352.00		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/20/08 0:00	124.30	1345.70		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/18/09 0:00	123.80	1346.20		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/8/10 0:00	113.60	1356.40	FOREIGN MATERIAL (OIL)	INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/7/11 0:00	124.70	1345.30		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	11/19/12 0:00	120.00	1349.90		INDEX	452597.378	3637251.634
D-06-08 27BDD2	325226111302201	625232	12/3/13 0:00	0.00	0.00	OTHER	INDEX	452597.378	3637251.634
D-06-08 27CCB1	325203111304801		3/10/42 0:00	56.31	1418.69		STANDARD	451911.375	3636722.137

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 27CCB1	325203111304801		6/18/42 0:00	61.80	1413.20		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		5/6/43 0:00	66.94	1408.06		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		8/2/44 0:00	76.99	1398.01		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		2/14/45 0:00	70.00	1405.00		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		7/31/45 0:00	81.29	1393.71		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		12/19/45 0:00	79.04	1395.96		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		6/6/46 0:00	86.87	1388.13		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		10/24/46 0:00	86.46	1388.54		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		12/19/46 0:00	72.53	1402.47		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		2/12/47 0:00	82.02	1392.98		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		6/5/47 0:00	96.54	1378.46		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		10/1/47 0:00	113.95	1361.05		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		11/4/47 0:00	104.84	1370.16		STANDARD	451911.375	3636722.137
D-06-08 27CCB1	325203111304801		2/3/48 0:00	96.88	1378.12		STANDARD	451911.375	3636722.137
D-06-08 27CCB2	325202111304901	625230	11/13/84 0:00	152.90	1322.10		STANDARD	451885.216	3636691.445
D-06-08 27CCB2	325202111304901	625230	10/31/88 0:00	122.30	1352.70		STANDARD	451885.216	3636691.445
D-06-08 27CCB2	325202111304901	625230	11/1/93 0:00	110.40	1364.60		STANDARD	451885.216	3636691.445
D-06-08 27CCB2	325202111304901	625230	7/24/97 0:00	150.10	1325.00	PUMPING	STANDARD	451885.216	3636691.445
D-06-08 27CDD	325156111302201	625231	12/1/75 0:00	189.00	1288.00	RECENTLY PUMPED	STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	1/17/77 0:00	172.70	1304.30		STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	11/13/84 0:00	152.60	1324.40		STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	10/31/88 0:00	126.70	1350.30		STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	11/1/93 0:00	108.70	1368.30		STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	7/24/97 0:00	157.00	1320.00	PUMPING	STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	11/5/98 0:00	94.30	1382.70		STANDARD	452583.032	3636463.482
D-06-08 27CDD	325156111302201	625231	1/1/14 0:00	0.00	0.00	PUMPING	STANDARD	452583.032	3636463.482
D-06-08 27DDD	325155111295001	620634	7/14/64 0:00	298.30	1177.70	PUMPING	STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	11/20/84 0:00	150.90	1325.10		STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	9/2/88 0:00	186.70	1289.30	PUMPING	STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	11/7/88 0:00	123.60	1352.40		STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	11/9/93 0:00	111.40	1364.60		STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	11/11/98 0:00	99.90	1376.10	RECENTLY PUMPED	STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	11/28/07 0:00	0.00	0.00	OBSTRUCTION	STANDARD	453417.410	3636437.915
D-06-08 27DDD	325155111295001	620634	12/11/13 0:00	0.00	0.00	OBSTRUCTION	STANDARD	453417.410	3636437.915
D-06-08 34ACC	325131111301901	611559	2/1/51 0:00	108.30	1375.70		STANDARD	452660.287	3635733.096
D-06-08 34ACC	325131111301901	611559	11/5/98 0:00	83.30	1401.00		STANDARD	452660.287	3635733.096
D-06-08 34ACC	325131111301901	611559	12/9/03 0:00	98.40	1385.60		STANDARD	452660.287	3635733.096
D-06-08 34ACC	325131111301901	611559	12/28/07 0:00	94.50	1389.50		STANDARD	452660.287	3635733.096
D-06-08 34ACC	325131111301901	611559	12/2/13 0:00	87.50	1396.50		STANDARD	452660.287	3635733.096
D-06-08 34CDD	325103111302501	624099	12/1/75 0:00	198.00	1291.00	RECENTLY PUMPED	STANDARD	452578.217	3634871.215

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 34CDD	325103111302501	624099	11/14/84 0:00	143.30	1345.70		STANDARD	452578.217	3634871.215
D-06-08 34DDD	325103111295101	620632	11/20/84 0:00	109.90	1380.10		STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	11/7/88 0:00	95.20	1394.80		STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	11/9/93 0:00	73.20	1416.80		STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	11/11/98 0:00	72.20	1418.00		STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	11/18/03 0:00	97.60	1392.40		STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	11/28/07 0:00	0.00	0.00	FOREIGN MATERIAL (OIL)	STANDARD	453384.009	3634867.401
D-06-08 34DDD	325103111295101	620632	12/11/13 0:00	92.00	1398.00		STANDARD	453384.009	3634867.401
D-06-08 35ABB	325151111291601		6/15/42 0:00	23.63	1460.37		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		10/29/42 0:00	25.49	1458.51		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		12/31/42 0:00	27.81	1456.19		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		5/5/43 0:00	30.90	1453.10		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		2/5/44 0:00	30.70	1453.30		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		8/2/44 0:00	35.18	1448.82		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		2/14/45 0:00	35.75	1448.25		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		7/31/45 0:00	40.70	1443.30		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		12/19/45 0:00	36.62	1447.38		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		6/6/46 0:00	34.62	1449.38		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		10/24/46 0:00	44.53	1439.47		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		12/19/46 0:00	43.38	1440.62		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		2/12/47 0:00	42.94	1441.06		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		6/5/47 0:00	48.10	1435.90		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		10/1/47 0:00	54.40	1429.60		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		2/3/48 0:00	57.07	1426.93		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		6/3/48 0:00	59.24	1424.76		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		7/26/48 0:00	64.71	1419.29		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		8/24/48 0:00	67.00	1417.00		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		9/22/48 0:00	66.92	1417.08		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		10/26/48 0:00	68.57	1415.43		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		11/23/48 0:00	67.45	1416.55		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		2/7/49 0:00	65.50	1418.50		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		4/13/49 0:00	65.92	1418.08		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		5/17/49 0:00	66.42	1417.58		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		7/27/49 0:00	67.61	1416.39		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		10/5/49 0:00	63.68	1420.32		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		12/7/49 0:00	60.90	1423.10		STANDARD	454300.586	3636341.355
D-06-08 35ABB	325151111291601		8/30/50 0:00	0.00	0.00	WELL DESTROYED	STANDARD	454300.586	3636341.355
D-06-08 35CCC	325103111294901		11/20/84 0:00	205.40	1283.60		STANDARD	453436.038	3634867.158
D-06-08 35CCD	325102111293501	620633	11/20/84 0:00	111.70	1377.30		STANDARD	453799.723	3634834.752
D-06-08 35CCD	325102111293501	620633	11/7/88 0:00	97.80	1391.20		STANDARD	453799.723	3634834.752

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08 35CCD	325102111293501	620633	11/9/93 0:00	76.60	1412.40		STANDARD	453799.723	3634834.752
D-06-08 35CCD	325102111293501	620633	11/11/98 0:00	0.00	0.00	WELL DESTROYED	STANDARD	453799.723	3634834.752
D-06-08 36ADA	325138111275001		9/17/51 0:00	110.00	1453.00		STANDARD	456533.959	3635931.020
D-06-08 36DDD	325106111275001		8/25/51 0:00	110.00	1390.00		STANDARD	456529.636	3634945.608
D-06-08N02DAA	325639111284801	610583	11/5/98 0:00	168.80	1301.20	CASCADING WATER	STANDARD	455068.478	3645234.322
D-06-08N02DAA	325639111284801	610583	12/16/13 0:00	171.90	1298.10		STANDARD	455068.478	3645234.322
D-06-08N02DCA	325605111285801	610585	11/8/84 0:00	154.00	1312.00		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	11/1/88 0:00	135.20	1330.80		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	11/4/93 0:00	120.00	1346.00	PUMPING	STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	1/10/94 0:00	113.60	1352.40		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	11/5/98 0:00	99.70	1366.00		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	11/21/03 0:00	117.70	1348.30		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	12/3/07 0:00	115.90	1350.10		STANDARD	454677.268	3644808.180
D-06-08N02DCA	325605111285801	610585	12/16/13 0:00	111.30	1354.70		STANDARD	454677.268	3644808.180
D-06-08N02DDA	325624111284701	610584	11/8/84 0:00	157.30	1312.70		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	6/13/85 0:00	183.60	1286.00	PUMPING	STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	11/1/88 0:00	140.30	1329.70		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	11/4/93 0:00	126.00	1344.00		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	11/5/98 0:00	111.80	1358.00		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	11/21/03 0:00	123.20	1346.80		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	12/3/07 0:00	122.20	1347.80		STANDARD	455069.344	3644787.657
D-06-08N02DDA	325624111284701	610584	12/4/13 0:00	120.10	1349.90		STANDARD	455069.344	3644787.657
D-06-08N03DAA	325641111295101	605240	11/4/98 0:00	77.20	1366.00		STANDARD	453453.729	3645223.162
D-06-08N03DAA	325641111295101	605240	11/21/03 0:00	96.90	1346.10	FOREIGN MATERIAL (OIL)	STANDARD	453453.729	3645223.162
D-06-08N03DAA	325641111295101	605240	12/3/07 0:00	91.70	1351.30	FOREIGN MATERIAL (OIL)	STANDARD	453453.729	3645223.162
D-06-08N03DAA	325641111295101	605240	12/4/13 0:00	0.00	0.00	OBSTRUCTION	STANDARD	453453.729	3645223.162
D-06-08N03DDA	325640111295001	605241	4/10/64 0:00	200.00	1242.00		STANDARD	453456.891	3644823.046
D-06-08N03DDA	325640111295001	605241	11/4/98 0:00	146.70	1295.00		STANDARD	453456.891	3644823.046
D-06-08N03DDA	325640111295001	605241	11/21/03 0:00	178.50	1263.50		STANDARD	453456.891	3644823.046
D-06-08N03DDA	325640111295001	605241	12/3/07 0:00	76.20	1365.80		STANDARD	453456.891	3644823.046
D-06-08N03DDA	325640111295001	605241	12/4/13 0:00	65.00	1377.00		STANDARD	453456.891	3644823.046
D-06-08N03DDD	325640111295101	605241	11/4/98 0:00	76.10	1368.00		STANDARD	453452.353	3644475.072
D-06-08N03DDD	325640111295101	605241	11/21/03 0:00	95.00	1349.00		STANDARD	453452.353	3644475.072
D-06-08N03DDD	325640111295101	605241	12/3/07 0:00	92.60	1351.40		STANDARD	453452.353	3644475.072
D-06-08N03DDD	325640111295101	605241	12/16/13 0:00	88.20	1355.80		STANDARD	453452.353	3644475.072
D-06-08S01BAB1	325614111282801	606777	11/13/84 0:00	160.80	1320.20		STANDARD	455540.685	3644453.166
D-06-08S01BAB1	325614111282801	606777	9/9/88 0:00	153.10	1327.90	PUMPING	STANDARD	455540.685	3644453.166
D-06-08S01BAB1	325614111282801	606777	11/1/88 0:00	145.10	1335.90		STANDARD	455540.685	3644453.166
D-06-08S01BAB1	325614111282801	606777	11/4/93 0:00	129.20	1351.80		STANDARD	455540.685	3644453.166

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08S01BAB1	325614111282801	606777	11/5/98 0:00	118.20	1362.80		STANDARD	455540.685	3644453.166
D-06-08S01BAB1	325614111282801	606777	12/16/13 0:00	125.20	1355.80		STANDARD	455540.685	3644453.166
D-06-08S018AB2	325613111283101	606778	11/8/84 0:00	385.90	1095.00	PUMPING	STANDARD	455537.745	3644443.867
D-06-08S01BAB2	325613111283101	606778	11/13/84 0:00	233.40	1247.60		STANDARD	455537.745	3644443.867
D-06-08S01BAB2	325613111283101	606778	11/1/88 0:00	205.80	1275.20		STANDARD	455537.745	3644443.867
D-06-08S01BAB2	325613111283101	606778	11/5/98 0:00	197.00	1284.00		STANDARD	455537.745	3644443.867
D-06-08S01BAB2	325613111283101	606778	12/16/13 0:00	234.30	1246.70		STANDARD	455537.745	3644443.867
D-06-08S02BDA	325559111292301	617563	11/8/84 0:00	145.50	1311.50		STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	6/19/85 0:00	160.00	1297.00	PUMPING	STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	11/9/88 0:00	123.90	1333.10		STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	11/2/93 0:00	104.50	1352.50		STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	11/4/98 0:00	86.00	1371.00		STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	11/21/03 0:00	102.70	1354.30	CASCADING WATER	STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	12/3/07 0:00	97.90	1359.10		STANDARD	454253.243	3644086.427
D-06-08S02BDA	325559111292301	617563	12/16/13 0:00	91.90	1365.10		STANDARD	454253.243	3644086.427
D-06-08S02BDD	325550111292001	617563	11/8/84 0:00	145.60	1311.40		STANDARD	454230.705	3643701.620
D-06-08S02BDD	325550111292001	617563	11/9/88 0:00	123.00	1334.00		STANDARD	454230.705	3643701.620
D-06-08S02BDD	325550111292001	617563	11/2/93 0:00	88.20	1368.80		STANDARD	454230.705	3643701.620
D-06-08S02CDD	325525111291901	617775	11/11/98 0:00	58.30	1400.00		STANDARD	454253.131	3642931.584
D-06-08S02CDD	325525111291901	617775	12/3/03 0:00	64.80	1393.20		STANDARD	454253.131	3642931.584
D-06-08S02CDD	325525111291901	617775	12/3/07 0:00	69.70	1388.30		STANDARD	454253.131	3642931.584
D-06-08S02CDD	325525111291901	617775	12/16/13 0:00	64.80	1393.20		STANDARD	454253.131	3642931.584
D-06-08S02DAA	325532111285201	617565	7/22/97 0:00	258.10	1213.90	PUMPING	STANDARD	455061.488	3643636.175
[illegible]	[illegible]	617777	2/21/51 0:00	107.85	1364.15		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	1/18/35 0:00	122.46	1349.54		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	1/19/56 0:00	141.42	1330.58		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	1/15/57 0:00	148.14	1323.86		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	1/7/77 0:00	184.40	1287.60		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	11/8/84 0:00	158.30	1313.70		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	6/18/85 0:00	306.60	1165.40	PUMPING	INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	12/18/85 0:00	141.80	1330.20		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	6/10/86 0:00	162.30	1309.70	NEARBY PUMPING	INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	12/12/86 0:00	156.40	1313.60		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	6/16/87 0:00	146.10	1323.90		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	12/23/87 0:00	131.40	1340.60		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	6/7/88 0:00	154.00	1318.00		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	11/9/88 0:00	186.70	1333.30		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	12/4/89 0:00	134.70	1337.30		INDEX	[illegible]	[illegible]
[illegible]	[illegible]	617777	12/10/90 0:00	133.00	1339.00		INDEX	[illegible]	[illegible]
D-06-08S02DAD	325531111285301	617777	12/16/91 0:00	131.40	1340.60		INDEX	455062.481	3643278.976

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08S02DAD	325531111285301	617777	11/19/92 0:00	125.90	1346.10		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/2/93 0:00	116.20	1355.80		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/9/94 0:00	111.70	1360.30		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/1/95 0:00	110.10	1361.90		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	10/29/96 0:00	108.90	1363.10		INDEX	[illegible]	3643278.976
D-06-08S02DAD	325531111285301	617777	7/22/97 0:00	148.80	1323.20	PUMPING	INDEX	[illegible]	3643278.976
D-06-08S02DAD	325531111285301	617777	12/10/97 0:00	96.90	1375.10		INDEX	[illegible]	3643278.976
D-06-08S02DAD	325531111285301	617777	11/5/98 0:00	98.50	1373.50		INDEX	[illegible]	3643278.976
D-06-08S02DAD	325531111285301	617777	11/18/99 0:00	106.50	1365.50		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	1/12/01 0:00	104.60	1367.40		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/5/01 0:00	108.10	1363.90		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	10/29/02 0:00	112.20	1359.80		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/21/03 0:00	121.10	1350.90		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/24/04 0:00	116.90	1355.10		INDEX	455062.481	3643278.976
D-06-08S02DAD	[illegible]	617777	4/12/05 0:00	118.20	1353.80		INDEX	455062.481	3643278.976
D-06-08S02DAD	[illegible]	617777	11/21/05 0:00	125.10	1346.90		INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	12/3/07 0:00	126.90	1345.10		INDEX	455062.481	3643278.976
D-06-08S02DAD	[illegible]	617777	11/18/09 0:00	109.70	1362.30		INDEX	455062.481	3643278.976
D-06-08S02DAD	[illegible]	617777	11/8/10 0:00	106.50	1365.50		INDEX	455062.481	3643278.976
D-06-08S02DAD	[illegible]	617777	11/8/11 0:00	0.00	0.00	OTHER	INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/14/12 0:00	0.00	0.00	WELL PLUGGED	INDEX	455062.481	3643278.976
D-06-08S02DAD	325531111285301	617777	11/14/13 0:00	0.00	0.00	WELL PLUGGED	INDEX	455062.481	3643278.976
D-06-08S02DDD	325526111284801	617776	11/8/84 0:00	161.00	1313.00		STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	6/18/85 0:00	268.20	1206.00	PUMPING	STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	11/9/88 0:00	139.80	1334.20		STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	11/2/93 0:00	120.50	1353.50		STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	7/22/97 0:00	97.60	1376.00	PUMPING	STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	11/5/98 0:00	100.80	1373.20	CASCADING WATER	STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	11/21/03 0:00	85.10	1388.90	CASCADING WATER	STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	12/3/07 0:00	83.50	1390.50		STANDARD	455058.407	3642958.717
D-06-08S02DDD	325526111284801	617776	12/16/13 0:00	82.60	1391.40		STANDARD	455058.407	3642958.717
D-06-08S03ADD	325547111295301	605237	11/8/84 0:00	139.40	1304.60		STANDARD	453428.020	3643696.162
D-06-08S03ADD	325547111295301	605237	11/9/88 0:00	113.20	1330.80		STANDARD	453428.020	3643696.162
D-06-08S03ADD	325547111295301	605237	11/2/93 0:00	90.80	1353.20		STANDARD	453428.020	3643696.162
D-06-08S03ADD	325547111295301	605237	9/24/97 0:00	90.20	1353.80	PUMPING	STANDARD	453428.020	3643696.162
D-06-08S03ADD	325547111295301	605237	11/4/98 0:00	68.70	1375.30		STANDARD	453428.020	3643696.162
D-06-08S03ADD	325547111295301	605237	12/16/13 0:00	74.70	1369.30		STANDARD	453428.020	3643696.162
D-06-08S03BAA	325614111302101	605347	11/5/84 0:00	136.90	1296.10		STANDARD	452650.095	3644448.060
D-06-08S03BAA	325614111302101	605347	4/4/85 0:00	149.30	1283.70	PUMPING	STANDARD	452650.095	3644448.060
D-06-08S03BAA	325614111302101	605347	11/7/88 0:00	107.40	1325.60		STANDARD	452650.095	3644448.060

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08S03BAA	325614111302101	605347	11/10/93 0:00	83.60	1349.40		STANDARD	452650.095	3644448.060
D-06-08S03BAA	325614111302101	605347	8/21/96 0:00	107.00	1326.00	PUMPING	STANDARD	452650.095	3644448.060
D-06-08S03BBD	325603111303601	605352	11/5/84 0:00	135.90	1291.10		STANDARD	452253.887	3644157.399
D-06-08S03BBD	325603111303601	605352	11/7/88 0:00	105.00	1322.00		STANDARD	452253.887	3644157.399
D-06-08S03BBD	325603111303601	605352	11/10/93 0:00	83.10	1343.90		STANDARD	452253.887	3644157.399
D-06-08S03BBD	325603111303601	605352	8/21/96 0:00	101.90	1325.00	PUMPING	STANDARD	452253.887	3644157.399
D-06-08S03BBD	325603111303601	605352	11/10/98 0:00	63.40	1364.00	FOREIGN MATERIAL (OIL)	STANDARD	452253.887	3644157.399
D-06-08S03BDC	325548111303401	605349	11/5/84 0:00	139.30	1290.70		STANDARD	452298.387	3643692.230
D-06-08S03BDC	325548111303401	605349	4/4/85 0:00	156.20	1274.00	PUMPING	STANDARD	452298.387	3643692.230
D-06-08S03BDC	325548111303401	605349	11/7/88 0:00	109.90	1320.10		STANDARD	452298.387	3643692.230
D-06-08S03BDC	325548111303401	605349	11/10/93 0:00	84.80	1345.20		STANDARD	452298.387	3643692.230
D-06-08S03BDC	325548111303401	605349	11/10/98 0:00	66.10	1364.00		STANDARD	452298.387	3643692.230
D-06-08S03BDD1	325550111302101		11/5/84 0:00	100.20	1331.80		STANDARD	452646.552	3643709.071
D-06-08S03BDD1	325550111302101		11/7/88 0:00	80.50	1351.50		STANDARD	452646.552	3643709.071
D-06-08S03BDD1	325550111302101		11/10/98 0:00	0.00	0.00	WELL DESTROYED	STANDARD	452646.552	3643709.071
D-06-08S03BDD2	325549111302101	605348	11/5/84 0:00	141.30	1291.70		STANDARD	452643.875	3643696.668
D-06-08S03BDD2	325549111302101	605348	11/10/93 0:00	87.10	1345.90		STANDARD	452643.875	3643696.668
D-06-08S03BDD2	325549111302101	605348	11/10/98 0:00	69.60	1363.00		STANDARD	452643.875	3643696.668
D-06-08S03BDD2	325549111302101	605348	12/3/03 0:00	86.40	1346.60		STANDARD	452643.875	3643696.668
D-06-08S03BDD2	325549111302101	605348	12/5/07 0:00	82.50	1350.50		STANDARD	452643.875	3643696.668
D-06-08S03BDD2	325549111302101	605348	12/19/13 0:00	0.00	0.00	WELL DESTROYED	STANDARD	452643.875	3643696.668
D-06-08S03CCA	325531111303601	605352	11/5/84 0:00	145.50	1289.50		STANDARD	452251.653	3643153.555
D-06-08S03CCA	325531111303601	605352	11/10/93 0:00	88.60	1346.40		STANDARD	452251.653	3643153.555
D-06-08S03CCA	325531111303601	605352	11/10/98 0:00	68.70	1366.00		STANDARD	452251.653	3643153.555
D-06-08S03CCA	325531111303601	605352	12/3/03 0:00	84.20	1350.80		STANDARD	452251.653	3643153.555
D-06-08S03CCA	325531111303601	605352	12/5/07 0:00	82.40	1352.60		STANDARD	452251.653	3643153.555
D-06-08S03CCD	325524111305601		11/5/84 0:00	141.90	1293.10		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		11/7/88 0:00	110.00	1325.00		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		11/10/93 0:00	86.60	1348.40		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		11/10/98 0:00	65.30	1369.70		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		12/3/03 0:00	85.85	1349.15		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		12/5/07 0:00	81.20	1353.80		STANDARD	452234.837	3642885.683
D-06-08S03CCD	325524111305601		12/19/13 0:00	73.70	1361.30		STANDARD	452234.837	3642885.683
D-06-08S03DCC	325522111301501	605238	11/5/84 0:00	137.10	1300.90		STANDARD	452798.192	3642846.064
D-06-08S03DCC	325522111301501	605238	11/7/88 0:00	111.60	1326.40		STANDARD	452798.192	3642846.064
D-06-08S03DCC	325522111301501	605238	6/10/91 0:00	229.80	1208.20	PUMPING	STANDARD	452798.192	3642846.064
D-06-08S03DCC	325522111301501	605238	11/10/93 0:00	87.70	1350.30		STANDARD	452798.192	3642846.064
D-06-08S03DCD	325524111300701		1/10/83 0:00	154.70	1284.30		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		11/5/84 0:00	142.30	1296.70		STANDARD	453013.982	3642881.954

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-08S03DCD	325524111300701		11/7/88 0:00	113.20	1325.80		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		11/10/93 0:00	88.50	1350.50		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		11/10/98 0:00	69.20	1370.00		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		12/3/03 0:00	88.80	1350.20		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		12/5/07 0:00	85.50	1353.50		STANDARD	453013.982	3642881.954
D-06-08S03DCD	325524111300701		12/19/13 0:00	0.00	0.00	WELL DESTROYED	STANDARD	453013.982	3642881.954
D-06-08S03DDA	325532111295101	605239	9/24/97 0:00	152.90	1292.10	PUMPING	STANDARD	453423.019	3643151.078
D-06-08S03DDD	325524111295201	605242	3/1/42 0:00	58.12	1388.88		STANDARD	453395.864	3642904.761
D-06-08S03DDD	325524111295201	605242	1/13/77 0:00	144.70	1302.30		STANDARD	453395.864	3642904.761
D-06-09 07BBC2	325514111274101		3/15/75 0:00	110.00	1397.00		STANDARD	456796.927	3642581.483
D-06-09 07CAA	325454111265101	605556	11/8/84 0:00	242.80	1275.20		STANDARD	457365.727	3641932.259
D-06-09 07CAA	325454111265101	605556	11/2/88 0:00	222.20	1295.80		STANDARD	457365.727	3641932.259
D-06-09 07CAA	325454111265101	605556	6/5/91 0:00	308.30	1209.70	PUMPING	STANDARD	457365.727	3641932.259
D-06-09 07CAA	325454111265101	605556	11/2/92 0:00	159.10	1358.90		STANDARD	457365.727	3641932.259
D-06-09 07CAA	325454111265101	605556	11/3/98 0:00	200.40	1317.60	CASCADING WATER	STANDARD	457365.727	3641932.259
D-06-09 07CAA	325454111265101	605556	1/2/14 0:00	252.00	1266.00		STANDARD	457365.727	3641932.259
D-06-09 07CB UNSURV	325451111273901		4/1/40 0:00	66.00	1446.00		STANDARD	456845.823	3641872.982
D-06-09 07CDD1	325432111272701	605557	3/6/52 0:00	112.20	1407.80		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	2/16/53 0:00	120.22	1399.78		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	2/17/54 0:00	136.62	1383.38		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	1/18/55 0:00	131.97	1388.03		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	1/16/56 0:00	125.04	1394.96		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	1/15/57 0:00	145.40	1374.60		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	1/13/58 0:00	153.27	1366.73		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	11/8/84 0:00	142.90	1377.10		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	11/2/88 0:00	129.90	1390.10		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	11/2/93 0:00	110.80	1409.20		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	11/3/98 0:00	101.10	1418.90		STANDARD	457362.751	3641285.623
D-06-09 07CDD1	325432111272701	605557	12/16/13 0:00	0.00	0.00	OTHER	STANDARD	457362.751	3641285.623
D-06-09 07CDD2	325432111271801	605559	11/8/84 0:00	256.40	1263.60		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	11/2/88 0:00	236.80	1283.20		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	6/5/91 0:00	355.20	1165.00	PUMPING	STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	11/2/93 0:00	209.20	1310.80		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	11/3/98 0:00	235.50	1285.00		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	11/20/03 0:00	253.40	1266.60		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	12/3/07 0:00	267.90	1252.10		STANDARD	457344.501	3641303.883
D-06-09 07CDD2	325432111271801	605559	12/4/13 0:00	264.20	1255.80	FOREIGN MATERIAL (OIL)	STANDARD	457344.501	3641303.883
D-06-09 17BAB PZ1	325427111262801		2/21/79 0:00	283.00	1262.00		STANDARD	458686.950	3641126.034
D-06-09 17BAB PZ2	325427111262802		2/21/79 0:00	204.70	1340.30		STANDARD	458686.950	3641126.034

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	SS-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-09 18BAD	325418111272301	622456	11/2/88 0:00	265.80	1254.20		STANDARD	457256.991	3640854.943
D-06-09 18BAD	325418111272301	622456	11/2/93 0:00	244.70	1275.30		STANDARD	457256.991	3640854.943
D-06-09 18BDC	325416111271801	622462	11/8/84 0:00	250.20	1266.80		STANDARD	457125.623	3640516.721
D-06-09 18BDC	325416111271801	622462	11/2/88 0:00	230.40	1286.60		STANDARD	457125.623	3640516.721
D-06-09 18BDC	325416111271801	622462	11/2/93 0:00	202.90	1314.10		STANDARD	457125.623	3640516.721
D-06-09 19BBD	325328111273501	622459	3/6/52 0:00	102.00	1415.00		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	2/11/53 0:00	103.54	1413.46		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	2/16/54 0:00	113.80	1403.20		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	1/18/55 0:00	111.69	1405.31		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	1/16/56 0:00	131.77	1385.23		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	1/15/57 0:00	139.38	1377.62		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	1/13/58 0:00	138.95	1378.05		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	1/17/77 0:00	191.40	1325.60		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/8/84 0:00	159.60	1357.40		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	12/18/85 0:00	135.30	1381.70		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	6/10/86 0:00	172.50	1344.50	NEARBY PUMPING	STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	12/12/86 0:00	134.20	1382.80		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	6/16/87 0:00	165.80	1351.20		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	12/23/87 0:00	127.80	1389.20		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	6/7/88 0:00	129.60	1387.40		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/2/88 0:00	128.00	1389.00		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/30/89 0:00	121.60	1395.40		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	12/10/90 0:00	119.90	1397.10		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	12/16/91 0:00	117.50	1399.50		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/20/92 0:00	111.30	1405.70		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/5/93 0:00	105.60	1411.40		STANDARD	456938.587	3639316.582
D-06-09 19BBD	325328111273501	622459	11/7/94 0:00	0.00	0.00	WELL DESTROYED	STANDARD	456938.587	3639316.582
D-06-09 27CBB	325205111244001		12/1/71 0:00	202.25	1412.75		STANDARD	461475.456	3636742.087
D-06-09 27CBB	325205111244001		1/25/72 0:00	202.45	1412.55		STANDARD	461475.456	3636742.087
D-06-09 27CBB	325205111244001		3/2/72 0:00	202.75	1412.25		STANDARD	461475.456	3636742.087
D-06-09 27CBB	325205111244001		3/29/72 0:00	202.80	1412.20		STANDARD	461475.456	3636742.087
D-06-09 27CBB	325205111244001		9/26/72 0:00	204.11	1410.89		STANDARD	461475.456	3636742.087
D-06-09 29BBA1 PZ1	325243111263701		2/28/79 0:00	268.60	1273.40		STANDARD	458439.707	3637924.437
D-06-09 29BBA1 PZ2	325243111263702		2/28/79 0:00	260.70	1281.30		STANDARD	458439.707	3637924.437
[illegible] PZ1	[illegible]		5/26/93 0:00	223.80	1318.20		INDEX	[illegible]	[illegible]
[illegible] PZ1	[illegible]		7/25/94 0:00	221.90	1320.10		INDEX	[illegible]	[illegible]
[illegible] PZ1	[illegible]		11/18/94 0:00	222.90	1319.10		INDEX	[illegible]	[illegible]
[illegible] PZ1	[illegible]		10/30/95 0:00	223.50	1318.50		INDEX	[illegible]	[illegible]
[illegible]	[illegible]		12/4/96 0:00	224.80	1317.70		INDEX	[illegible]	[illegible]
D-06-09 29BBA3 PZ1	325243111263901		12/16/97 0:00	221.90	1320.10		INDEX	458380.081	3637893.868

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-09 29BBA3 PZ1	325243111263901		11/19/98 0:00	220.90	1321.10		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/8/99 0:00	225.90	1316.10		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/7/00 0:00	231.70	1310.30		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/5/01 0:00	229.00	1313.00		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		10/30/02 0:00	234.90	1307.10		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		12/16/03 0:00	238.00	1304.00		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		3/30/05 0:00	233.70	1308.80		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		12/22/05 0:00	238.80	1303.20		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		1/2/07 0:00	239.30	1302.70		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		12/3/07 0:00	242.80	1299.20		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		12/10/08 0:00	243.40	1298.60		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/16/09 0:00	245.50	1296.50		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		12/7/10 0:00	242.70	1299.30		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		1/27/12 0:00	244.60	1297.40		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/15/12 0:00	250.60	1291.40		INDEX	458380.081	3637893.868
D-06-09 29BBA3 PZ1	325243111263901		11/14/13 0:00	251.30	1290.70		INDEX	458380.081	3637893.868
D-06-09 29BBA4	325243111264001		5/26/93 0:00	255.20	1286.80		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		7/25/94 0:00	245.80	1296.20		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/16/94 0:00	244.60	1297.40		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		10/30/95 0:00	250.70	1291.80		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/4/96 0:00	257.10	1284.90		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		12/16/97 0:00	250.20	1291.80		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/19/98 0:00	253.60	1288.40		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/8/99 0:00	270.20	1271.80		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/7/00 0:00	277.30	1264.70		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/5/01 0:00	261.45	1280.55		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		10/30/02 0:00	283.25	1258.75		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		12/16/03 0:00	282.90	1259.10		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		12/22/05 0:00	275.00	1267.00		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		1/2/07 0:00	276.40	1265.60		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/25/09 0:00	263.30	1278.70		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		12/7/10 0:00	279.50	1262.50		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		1/27/12 0:00	280.40	1261.60		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/15/12 0:00	296.60	1245.40		INDEX	458359.032	3637893.956
D-06-09 29BBA4	325243111264001		11/14/13 0:00	300.00	1242.00		INDEX	458359.032	3637893.956
D-06-09 30CCC	325158111273901		2/1/72 0:00	215.00	1290.00		STANDARD	456822.584	3636545.588
D-06-09 30CCD	325200111273301		1/13/58 0:00	119.60	1389.40		STANDARD	456978.724	3636606.548
D-06-09 30CCD	325200111273301		4/25/84 0:00	63.50	1445.50		STANDARD	456978.724	3636606.548
D-06-09 30CCD	325200111273301		11/8/88 0:00	47.60	1461.40		STANDARD	456978.724	3636606.548
D-06-09 30CCD	325200111273301		11/9/93 0:00	60.40	1448.60		STANDARD	456978.724	3636606.548

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-09 33ACB	325143111251901	638400	11/8/88 0:00	249.90	1338.10		STANDARD	460568.023	3635944.800
D-06-09 33ACB	325143111251901	638400	11/9/93 0:00	237.80	1350.20		STANDARD	460568.023	3635944.800
D-06-09 33ACB	325143111251901	638400	11/12/98 0:00	231.70	1356.00		STANDARD	460568.023	3635944.800
D-06-09 33ACB	325143111251901	638400	11/19/03 0:00	243.30	1344.70		STANDARD	460568.023	3635944.800
D-06-09 33ACB	325143111251901	638400	11/28/07 0:00	242.30	1345.70		STANDARD	460568.023	3635944.800
D-06-09 33ACB	325143111251901	638400	12/4/13 0:00	241.70	1346.30		STANDARD	460568.023	3635944.800
D-06-09 34ABC	325139111241101		9/10/48 0:00	172.37	1455.63		STANDARD	462226.018	3635938.477
D-06-09N04DDD	325617111244801	620899	9/28/49 0:00	199.00	1389.00		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	3/6/52 0:00	193.82	1394.18		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	2/16/53 0:00	204.51	1383.49		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	2/17/54 0:00	213.70	1374.30		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/26/55 0:00	209.94	1378.06		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/16/56 0:00	212.08	1375.92		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/16/57 0:00	217.80	1370.20		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/13/58 0:00	228.00	1360.00		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/12/59 0:00	222.40	1365.60		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/25/60 0:00	219.90	1368.10		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/6/61 0:00	229.47	1358.53		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/17/62 0:00	228.93	1359.07		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/31/63 0:00	241.82	1346.18		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/30/64 0:00	247.51	1340.49		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	12/23/64 0:00	251.67	1336.33		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/25/66 0:00	247.86	1340.14		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/20/67 0:00	261.90	1326.10		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	2/6/68 0:00	274.15	1313.85		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	2/6/69 0:00	268.80	1319.20		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/7/70 0:00	266.20	1321.80		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/8/71 0:00	278.10	1314.90		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/3/72 0:00	277.50	1310.50		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/16/73 0:00	285.20	1302.80		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/8/74 0:00	286.10	1301.90		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	3/7/75 0:00	312.00	1276.00		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	12/16/75 0:00	272.60	1315.40		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/14/77 0:00	284.90	1303.10		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/23/78 0:00	297.30	1290.70		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/11/80 0:00	295.60	1292.40		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/23/81 0:00	308.20	1281.80		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	1/21/82 0:00	301.50	1286.50		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	11/14/84 0:00	298.60	1289.40		INDEX	461821.239	3644484.330
D-06-09N04DDD	325617111244801	620899	6/20/85 0:00	323.20	1264.80	PUMPING	INDEX	461821.239	3644484.330

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-09N04DDD	325617111244801	620899	12/18/85 0:00	282.70	1305.30		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	6/10/86 0:00	329.20	1258.80	PUMPING	INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/12/86 0:00	277.90	1310.10		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	6/10/87 0:00	303.30	1284.70		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	6/7/88 0:00	294.00	1294.00		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/4/88 0:00	282.90	1305.10		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/4/89 0:00	283.00	1305.00		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/27/91 0:00	283.00	1305.00		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/19/92 0:00	275.10	1312.90		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/3/93 0:00	260.80	1327.20		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/9/94 0:00	258.40	1329.60		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/1/95 0:00	259.00	1329.00		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	10/29/96 0:00	257.20	1330.80		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/10/97 0:00	254.20	1333.80		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/6/00 0:00	269.10	1318.90		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/5/01 0:00	273.70	1314.30		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	12/3/03 0:00	282.20	1305.80		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/24/04 0:00	288.50	1299.50		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/9/05 0:00	292.80	1295.20		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/21/06 0:00	289.40	1298.60		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/19/08 0:00	302.70	1285.30	RECENTLY PUMPED	INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/18/09 0:00	289.80	1298.20		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	11/8/10 0:00	292.40	1295.60		INDEX	461321.239	3644484.930
D-06-09N04DDD	325617111244801	620899	1/6/14 0:00	308.20	1279.80		INDEX	461321.239	3644484.930
D-06-09N06DAA	325634111264801	604213	3/6/52 0:00	164.87	1357.13		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	2/16/53 0:00	163.60	1358.40		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	2/17/54 0:00	160.92	1361.08		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	1/26/55 0:00	174.58	1347.42		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	1/16/56 0:00	165.00	1357.00		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	1/13/58 0:00	170.10	1351.90		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/8/84 0:00	247.10	1274.90		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/18/85 0:00	213.40	1308.60		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/12/86 0:00	211.90	1310.10		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	6/16/87 0:00	261.30	1260.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/23/87 0:00	222.50	1299.50		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/2/88 0:00	216.80	1305.20		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/10/90 0:00	240.30	1281.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	4/15/91 0:00	353.50	1168.50	PUMPING	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/16/91 0:00	225.30	1296.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/20/92 0:00	208.80	1313.20		INDEX	458191.913	3645072.856

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	. UTM EAST	UTM NORTH
D-06-09N06DAA	325634111264801	604213	11/2/93 0:00	191.70	1330.30		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/9/94 0:00	183.20	1338.80	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/1/95 0:00	173.30	1348.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	10/29/96 0:00	171.40	1350.60		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/10/97 0:00	205.60	1316.40	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/5/98 0:00	246.30	1275.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	1/12/01 0:00	208.60	1313.40	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/5/01 0:00	203.70	1318.30	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	10/29/02 0:00	204.90	1317.10	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/24/04 0:00	232.30	1289.70		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/9/05 0:00	234.80	1287.20	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/21/06 0:00	228.70	1293.30	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/4/07 0:00	228.80	1293.20	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/19/08 0:00	223.30	1298.70	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/18/09 0:00	220.80	1301.20		INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/8/10 0:00	217.30	1304.70	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/8/11 0:00	0.00	0.00	OBSTRUCTION	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	11/14/12 0:00	246.20	1275.80	CASCADING WATER	INDEX	458191.913	3645072.856
D-06-09N06DAA	325634111264801	604213	12/3/13 0:00	0.00	0.00	OTHER	INDEX	458191.913	3645072.856
D-06-09S04AAD	325610111245101	620900	9/28/49 0:00	199.50	1388.50		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	3/6/52 0:00	195.83	1392.17		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	2/16/53 0:00	206.95	1381.05		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	2/17/54 0:00	236.36	1351.64		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	1/26/55 0:00	204.00	1384.00		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	1/16/56 0:00	211.64	1376.36		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	1/16/57 0:00	217.22	1370.78		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	1/13/58 0:00	229.00	1359.00		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	11/14/84 0:00	302.40	1285.60		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	11/4/88 0:00	282.70	1305.30		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	12/3/03 0:00	288.60	1299.40		STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	12/4/07 0:00	296.50	1291.50	CASCADING WATER	STANDARD	461322.629	3644194.647
D-06-09S04AAD	325610111245101	620900	12/4/13 0:00	309.50	1278.50		STANDARD	461322.629	3644194.647
D-06-09S06BAD	325601111272101	621903	11/8/84 0:00	318.30	1192.00	PUMPING	STANDARD	457322.686	3644026.491
D-06-09S06BAD	325601111272101	621903	11/13/84 0:00	246.70	1263.30		STANDARD	457322.686	3644026.491
D-06-09S06BAD	325601111272101	621903	11/2/88 0:00	205.90	1304.10		STANDARD	457322.686	3644026.491
D-06-09S06BAD	325601111272101	621903	11/2/93 0:00	177.50	1332.50		STANDARD	457322.686	3644026.491
D-06-09S06BAD	325601111272101	621903	11/5/98 0:00	173.10	1336.90	CASCADING WATER	STANDARD	457322.686	3644026.491
D-06-09S06BAD	325601111272101	621903	11/21/03 0:00	0.00	0.00	WELL DESTROYED	STANDARD	457322.686	3644026.491
D-06-09S06BDD1	325607111272101		3/6/52 0:00	148.00	1279.00		STANDARD	457323.484	3644211.293
D-06-09S06BDD1	325607111272101		2/17/54 0:00	0.00	0.00	WELL DESTROYED	STANDARD	457323.484	3644211.293

TABLE 2. ADWR GWSI GROUNDWATER LEVELS IN STUDY AREA

CADASTRAL LOCATION	GWSI NUMBER	55-WELL REGISTRY NUMBER	DATE MEASURED	DEPTH TO WATER (FT BLS)	WATER LEVEL ELEVATION (FT AMSL)	REMARKS	WELL TYPE	UTM EAST	UTM NORTH
D-06-09S06BDD2	325606111272101		3/1/47 0:00	80.00	1431.00		STANDARD	457323.351	3644180.474
D-06-09S06BDD2	325606111272101		5/2/57 0:00	0.00	0.00	DRY	STANDARD	457323.351	3644180.474
D-06-09S06DCA	325600111270701		5/1/47 0:00	75.00	1445.00		STANDARD	457686.136	3643994.112
D-06-09S06DCD	325534111270801	621909	1/17/77 0:00	151.70	1369.30		STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	11/8/84 0:00	307.70	1213.00	PUMPING	STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	11/14/84 0:00	250.40	1270.60		STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	11/2/88 0:00	215.10	1305.90		STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	11/2/93 0:00	179.20	1341.80		STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	11/9/98 0:00	182.40	1338.60	CASCADING WATER	STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	12/8/03 0:00	230.20	1290.80		STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	12/3/07 0:00	0.00	0.00	OTHER	STANDARD	457655.396	3642885.637
D-06-09S06DCD	325534111270801	621909	12/16/13 0:00	0.00	0.00	OTHER	STANDARD	457655.396	3642885.637

TABLE 3
PINAL AMA UNDERGROUND STORAGE FACILITIES
AWC PINAL VALLEY RECHARGE PROJECT USF/WS APPLICATION

Permit Number	Location	PAMA Model Row	PAMA Model Column	Facility Name	Permittee	Sub-basin	Water Type, Recharge Method	Issue Date	Termination Date	Permitted Storage Volume (AF/Y)	R2000	R2001	R2002	R2003	R2004	R2005	R2006	R2007	R2008	R2009	R2010	R2011	R2012	R2013
71-209000	D-07-06 35CBB	161	168	Az City San. Dist. Recharge Facility	Az City Sanitary District	Eloy	Effluent, 6 Infil Basins	7/25/2007	7/25/2028	2,240									31.4	8.5	137.1	122.5	106.2	137.8
71-211279	D-06-02 01BAA	137	124	Southwest Water Distribution	Global Water - PV Utilities Co.	Maricopa-Stanfield	Effluent, 3 Recharge Wells	7/25/2007	7/25/2027	1,120														
71-211285	D-05-03 26CB	134	132	Santa Rosa Utility Co.	Santa Rosa Utility Co.	Maricopa-Stanfield	Effluent, 4 Recharge Wells, 2 Infil. Basins	11/25/2011	11/25/2031	2,577														
71-211286	D-06-07 32DDD D-06-07 32DAD D-06-07 34BAA D-06-07 34BAD D-07-07 09ABB	158 159 148 148 153	177 177 180 180 179	EJR Ranch Recharge Facility	Picacho Sewer Co.	Eloy	Effluent, 5 ASR Wells	11/25/2011	11/25/2031	2,092											27.5	24.8	20.1	17.9
71-211290	D-04-06 25CBB	127	155	Anthem at Merrill Ranch	Johnson Utilities Co.	Eloy	Effluent, 4 Infil Basins, 7 Contingency VZ Wells	3/29/2010	3/29/2030	3,360											737.0	557.2	606.0	361.5
71-216374	D-05-03 17AAA	139	128	Southwest Water Reclamation	Global Water - PV Utilities Co.	Maricopa-Stanfield	Effluent	10/17/2008	10/17/2028	2,240														
71-220045	D-07-08 16C	154, 155	190	Eloy Detention Center	Corrections Corp of America	Eloy	Effluent, Infil Basins	11/17/2011	11/17/2031	2,726														
71-221491	D-06-05 12C, 12D	141	160, 161	Casa Grande Constructed USF	City of Casa Grande	Eloy	Effluent, 5 Infil Basins	4/18/2013	4/18/2033	2,100												87.6	1,063.2	828.5
71-221492	D-06-05 12CBD D-06-05 12ABB	141 140	160 161	Casa Grande Managed USF	City of Casa Grande	Eloy	Effluent	12/16/2013	12/16/2033	3,500														
71-519876	D-04-09 23DDA	121	206	North Florence Recharge Facility	Town of Florence	Eloy	Effluent		2012	135	73.0	130.0	77.0	89.0	40.0	79.0	95.0	95.0	76.0	60.0			63.4	
71-588559	D-06-07 24ACC	145	185	Hohokam WRF	Pinal Co. Water Augmentation Authority	Eloy	CAP		2004					740.8										
71-591932	D-07-07 36CBB	160	185	Eloy Reclaimed Water Recharge	City of Eloy	Eloy	Effluent, 6 Infil Basins	4/9/2012	2/3/2024	2,240					194.0	814.0	808.0	687.0	472.0	663.0	582.9	510.5	505.6	329.6
71-591938	D-07-07 09BB, 09BC	152	178	Sun Lakes at Casa Grande RF	Picacho Sewer Co.	Eloy	Effluent, 6 Infil Basins & VZ Wells	2/25/2008	12/31/2028	340								2.0	8.0	10.0	27.5	24.8	18.7	17.9

Data Source: ADWR Annual Underground Water Storage Reports.

NOTES:

71-209000 Az City San. Dist. Recharge Facility — SE cnr of Henness Rd. & Sommerfield Rd.
- Phase 1 1120 AFA
- Phase 2 2240 AFA
- Max. Storage Vol. 30000 AF
- 6 Infiltration basins

71-211279 Southwest Water Distribution
- 1120 AFA
- 3 Recharge wells (direct injection)

71-211285 Santa Rosa Utility Co. — SE cnr of Smith Rd. & Teel Rd.
- 2577 AFA
- 4 Recharge Wells, 2 Infiltration Basins

71-211286 EJR Ranch Recharge Facility
- Phase 1 272 AFA
- Phase 2 727 AFA
- Phase 3 1182 AFA
- Phase 4 1637 AFA
- Phase 5 2092 AFA
- Max. Storage Vol. 41840 AF

71-211290 Anthem at Merrill Ranch
- 3360 AFA
- 4 Infiltration Basins, 7 Contingency VZ Wells

71-216374 Southwest WRF (Campus 2) — SW cnr of Green Rd. & Peters and Nall Rd.
- Phase 1 1120 AFA
- Phase 2 2240 AFA
- 3 Recharge wells (direct injection)

71-220045 Eloy Detention Center USF — SE cnr of La Palma Rd. & Hanna Rd.
- 2726 AFA
- Infiltration Basins

71-221491 Casa Grande Constructed USF — NE cnr of Burris Rd. & Kortsen Rd.
- 2100 AFA
- 5 Infiltration Basins

71-221492 Casa Grande Managed USF — N. Branch S. Cruz Wash, discharge point is between Burris Rd. and Thornton Rd.
- 3500 AFA
- Headworks at D-06-05 12 CBA

71-591932 Eloy Reclaimed Water Recharge — 1/2 mi. south of Houser Rd. & 1/2 mi. west of Eleven Mile Corner Rd.
- 2240 AFA
- 6 Infiltration basins

71-591938 Sun Lakes at Casa Grande
- 340.4 AFA
- 6 Infiltration basins & VZ Wells

CLEAR CREEK ASSOCIATES

TABLE 4. MODEL WATER BALANCE (1923 - 2034)
AWC PINAL VALLEY RECHARGE PROJECT USF/WS APPLICATION

			INFLOW							OUTFLOW							
YEAR	stress	time step	STORAGE	CONST HEAD	WELLS	RECHARGE	STREAM LEAKAGE	INTERBED STORAGE	TOTAL INFLOW	STORAGE	CONST HEAD	WELLS	ET	STREAM LEAKAGE	INTERBED STORAGE	TOTAL OUTFLOW	PERCENT ERROR
1922	1	1	-	80	23	1	254	-	359	-	41	-	263	60	-	363	(0.30)
1923	2	10	98,128	30,751	8,401	87,370	3,081	8,985	234,715	12,495	13,706	94,208	84,107	30,436	862	235,814	(0.13)
1924	3	10	77,374	31,668	8,424	83,861	1,383	7,743	210,454	4,761	13,221	97,467	70,902	23,700	316	210,357	0.01
1925	4	10	80,705	32,124	8,424	67,788	1,047	8,017	198,102	1,807	12,847	99,468	61,189	22,514	106	197,932	0.02
1926	5	10	74,974	32,473	8,424	67,788	1,046	7,721	192,426	1,289	12,512	102,468	53,875	22,836	87	192,269	0.02
1927	6	10	60,487	32,747	8,424	80,043	1,046	8,544	189,292	1,789	12,205	104,467	48,871	21,699	104	189,115	0.02
1928	7	10	59,055	32,958	8,424	80,043	1,047	6,225	187,750	1,512	11,922	107,467	45,151	21,438	97	187,587	0.02
1929	8	10	47,370	33,109	8,424	93,650	1,047	5,320	188,920	3,520	11,756	109,468	42,587	21,233	223	188,787	0.02
1930	9	10	41,260	33,231	8,424	130,830	1,083	4,675	219,502	11,911	11,567	133,467	40,989	20,710	855	219,499	0.00
1931	10	10	39,742	33,345	8,424	160,234	1,144	4,446	247,333	15,094	11,440	158,466	40,714	20,185	1,256	247,306	0.00
1932	11	10	56,336	33,788	9,088	156,844	1,191	5,861	263,205	8,501	11,340	183,072	39,413	20,091	746	263,163	0.00
1933	12	10	85,681	33,804	9,088	143,523	1,232	8,813	282,141	6,862	11,243	208,070	35,431	19,889	540	282,036	0.01
1934	13	10	61,679	33,862	9,088	176,715	1,259	9,043	311,647	14,959	11,135	233,071	31,577	19,729	1,223	311,693	(0.00)
1935	14	10	82,317	33,526	9,088	292,014	1,367	7,630	425,941	92,113	11,363	257,455	37,064	18,490	8,235	425,718	0.01
1936	15	10	104,715	33,007	9,088	247,743	1,510	10,318	406,381	54,907	11,753	279,226	36,577	19,188	4,870	406,521	(0.01)
1937	16	10	98,156	32,414	9,088	279,530	1,601	9,832	430,621	56,398	12,129	300,878	36,197	18,946	5,693	430,241	0.02
1938	17	10	129,787	31,982	9,088	218,287	1,593	14,421	405,158	19,788	12,435	317,898	34,689	18,891	1,480	405,179	(0.00)
1939	18	10	152,691	31,575	9,088	217,858	1,570	15,400	428,182	18,470	12,649	347,952	31,811	18,879	1,057	428,819	(0.01)
1940	19	10	152,591	29,968	9,088	257,014	1,542	14,981	465,183	29,856	12,980	371,561	29,066	19,862	1,946	465,351	(0.01)
1941	20	10	135,945	29,913	9,088	358,005	1,741	14,753	549,445	71,304	13,114	411,414	29,124	18,748	5,673	549,376	0.00
1942	21	10	192,347	28,940	11,680	381,987	1,827	17,862	634,342	69,161	14,339	496,242	30,576	18,195	5,808	634,320	0.00
1943	22	10	173,571	28,628	11,680	397,150	1,853	17,295	630,178	57,143	16,244	500,539	32,835	18,425	4,875	630,062	0.00
1944	23	10	187,581	28,253	11,680	372,525	1,942	18,498	618,480	25,282	20,687	519,425	33,221	17,933	1,958	618,506	(0.00)
1945	24	10	266,143	25,590	11,680	355,458	1,919	25,829	686,619	14,931	25,607	596,402	30,163	18,477	957	686,536	0.00
1946	25	10	347,611	26,149	11,680	311,280	1,998	32,556	731,175	8,974	30,058	648,453	25,407	17,743	566	731,200	0.00
1947	26	10	390,188	26,849	11,680	307,613	1,854	34,800	772,985	9,254	33,393	691,027	20,826	18,045	514	773,059	(0.00)
1948	27	10	524,539	25,147	11,680	390,573	1,894	49,025	1,006,859	8,308	35,722	927,672	17,102	17,687	377	1,006,868	(0.00)
1949	28	10	583,605	22,767	11,680	491,299	1,957	51,469	1,162,778	23,710	29,021	1,079,254	15,354	17,180	1,542	1,162,842	(0.00)
1950	29	10	579,709	17,691	11,680	395,563	2,117	44,963	1,053,723	9,201	34,585	979,396	13,712	16,219	693	1,053,806	(0.00)
1951	30	10	604,508	20,285	11,680	380,251	2,390	52,789	1,071,903	9,526	37,602	997,331	11,626	15,410	492	1,071,986	(0.00)
1952	31	10	470,574	21,704	15,601	451,981	2,569	43,642	1,006,070	23,034	37,222	919,072	10,367	14,651	1,769	1,006,114	(0.00)
1953	32	10	835,004	22,667	15,601	454,960	2,686	94,751	1,425,671	14,704	38,435	1,347,791	9,618	15,011	442	1,425,601	(0.00)
1954	33	10	627,660	21,227	15,601	510,582	2,847	74,607	1,252,665	24,011	39,695	1,160,637	8,984	16,306	1,571	1,251,214	0.03
1955	34	10	590,092	18,363	15,601	537,107	2,834	82,263	1,246,260	15,379	39,888	1,163,637	8,942	17,455	889	1,246,188	0.00
1956	35	10	638,977	18,566	15,601	378,141	3,047	82,214	1,136,546	4,103	39,839	1,066,039	8,038	13,728	311	1,134,058	0.05
1957	36	10	628,599	19,451	15,601	378,182	2,072	88,981	1,132,886	4,609	39,962	1,069,095	7,119	11,834	239	1,132,878	0.00
1958	37	10	587,471	19,784	15,601	524,974	1,038	101,172	1,250,040	24,898	41,785	1,184,238	6,677	10,834	1,613	1,250,044	(0.00)
1959	38	10	691,632	19,404	15,601	485,277	784	101,452	1,236,130	4,384	43,741	1,171,659	6,287	9,808	263	1,236,142	(0.00)
1960	39	10	535,963	20,476	15,601	490,897	746	92,399	1,156,081	11,908	44,782	1,075,367	5,893	9,487	782	1,148,218	0.17
1961	40	10	677,805	21,910	15,601	384,567	898	96,862	1,197,443	7,155	46,488	1,128,839	5,453	8,985	499	1,197,420	0.00
1962	41	10	558,602	23,039	15,601	440,362	716	74,728	1,113,048	19,908	46,632	1,031,477	4,960	8,062	1,536	1,112,576	0.01
1963	42	10	546,736	21,962	16,388	401,943	783	80,242	1,068,053	20,989	47,206	984,848	4,514	6,357	876	1,064,791	0.08
1964	43	10	632,187	21,230	16,365	436,189	840	121,539	1,228,350	33,948	42,623	1,136,364	4,230	5,992	593	1,223,751	0.09
1965	44	10	391,187	23,222	16,365	546,216	582	65,159	1,044,712	79,643	34,058	891,021	4,938	19,141	4,687	1,035,498	0.22
1966	45	10	411,567	27,247	16,365	467,083	973	61,051	984,285	34,056	30,817	887,612	4,580	7,096	1,891	976,053	0.21
1967	46	10	463,685	33,605	16,365	596,743	289	85,937	1,196,625	49,633	27,893	1,095,041	4,393	9,919	1,505	1,188,384	0.17
1968	47	10	414,222	31,171	16,365	452,629	1,311	52,201	967,898	27,745	28,241	890,725	3,810	5,237	2,682	958,441	0.25
1969	48	10	488,148	30,582	16,385	471,826	1,840	72,320	1,081,081	23,185	27,529	1,016,988	3,118	4,022	793	1,073,636	0.17
1970	49	10	416,891	27,484	16,365	410,041	1,622	52,122	924,525	14,446	28,826	867,769	2,716	3,308	2,441	919,506	0.14
1971	50	10	445,727	27,840	16,365	317,787	939	49,396	858,094	12,576	32,853	796,602	2,446	2,492	2,109	849,078	0.26
1972	51	10	314,873	29,861	16,365	471,371	345	44,017	876,832	47,300	28,451	778,237	2,748	8,442	3,100	868,279	0.25
1973	52	10	414,453	27,774	16,365	513,823	1,347	64,298	1,038,061	37,857	27,591	959,596	2,517	3,660	1,160	1,032,380	0.14
1974	53	10	515,092	28,753	16,365	564,166	346	89,475	1,214,237	40,068	26,530	1,136,364	2,101	1,780	910	1,207,753	0.13
1975	54	10	426,965	34,129	16,365	511,047	41	64,888	1,053,435	30,147	24,786	982,553	1,798	1,308	1,720	1,042,312	0.27
1976	55	10	478,559	32,588	16,365	432,363	10	60,096	1,020,982	14,033	25,111	977,961	1,562	1,126	525	1,020,318	0.21
1977	56	10	516,693	31,304	16,365	426,962	15	75,749	1,067,087	30,345	22,154	1,005,510	1,440	1,091	979	1,061,519	0.13
1978	57	10	210,844	32,164	16,365	611,910	591	36,624	908,497	128,368	22,362	732,323	1,917	4,159	7,856	896,984	0.32
1979	58	10	244,586	32,244	16,365	505,549	328	32,937	832,008	76,550	21,505	718,549	1,858	1,946	5,219	825,627	0.18
1980	59	10	271,164	34,163	16,365	676,515	587	48,986	1,047,790	132,703	20,653	870,064	1,912	5,310	6,447	1,037,089	0.26
1981	60	10	327,474	32,843	16,385	631,333	300	60,817	1,069,132	63,686	21,139	968,779	1,635	1,699	2,689	1,060,027	0.21
1982	61	10	282,290	37,120	16,365	517,861	4	45,369	898,010	34,579	18,778	833,333	1,322	1,110	2,647	891,770	0.20
1983	62	10	120,814	39,778	17,365	942,323	432	14,352	1,135,064	570,428	19,421	475,207	2,929	29,908	33,440	1,131,332	0.08
1984	63	10	223,829	27,747	14,705	870,820	211	37,979	985,290	282,778	19,064	640,496	3,245	17,295	15,536	978,413	0.18
1985	64	10	154,194	39,024	14,705	775,941	607	35,761	1,020,231	287,515	19,129	663,453	3,306	20,952	16,614	1,010,969	0.21
1986	65	10	199,907	37,385	14,705	562,443	537	27,016	841,985	211,669	18,620	583,104	2,703	6,617	13,127	835,840	0.18
1987	66	10	188,461	36,553	14,705	544,077	1,139	27,459	812,394	164,594	18,262	610,652	2,094	2,993	10,017	808,611	0.12
1988	67	10	129,089	34,975	14,705	624,426	127	19,524	822,844	198,677	18,521	589,991	1,709	1,540	10,595	819,033	0.12
1989	68	10	127,077	34,192	14,705	658,861	20	18,213	853,067	218,245	18,851	599,178	1,419	1,186	12,187	850,861	0.06
1990	69	10	215,213	30,466	14,705	419,519	11	16,758	697,677	196,769	19,387	456,841	1,320	1,259	17,904	693,080	(0.01)
1991	70	10	112,083	36,531	14,705	495,868	3	10,643	669,832	128,194	17,507	509,642	1,358	1,890	10,509	669,100	0.03
1992	71	10	81,030	41,089	14,705	645,087	133	4,034	766,078	404,224	16,200	300,735	1,776	7,207	35,212	765,353	0.02
1993	72	10	32,743	42,081	15,705	1,278,696	14,954	2,543	1,386,703	920,071	18,068	275,482	12,781	91,313	67,431	1,386,145	0.01
1994	73	10	207,661	41,713	14,705	592,287	2,195	15,185	873,745	413,723	19,463	394,858	8,396	11,024	28,005	875,468	(0.05)
1995	74	10	38,168	40,643	14,705	725,438	597	4,278	823,827	333,907	19,040	433,884	5,207	5,630	23,453	821,122	0.08
1996	75	10	94,518	38,913	14,705	716,253	1,218	10,986	877,594	277,029	18,976	557,851	4,697	3,208	16,447	878,109	(0.03)
1997	76	10	128,555	38,708	14,705	596,878	258	9,943	789,046	263,887	18,484	482,094	3,504	1,775	19,701	789,445	(0.01)
1998	77	10	72,259	35,215	14,705	585,399	56	5,090	712,725	234,938	18,636	486,180	2,762	1,460	17,625	711,601	0.04
1999	78	10	139,745	32,830	14,705	491,276	41	10,614	689,210	193,121	18,935	458,137	2,213	1,437	14,265	688,118	0.00
2000	79	10	109,007	31,457	14,705	548,668	70	8,975	712,881	225,530	18,941	447,658	2,053	2,052	16,174	712,388	0.02
2001	80	10	100,655	32,236	14,705	532,599	47	6,100	686,341	217,321	18,226	429,293	1,804	1,494	17,710	685,848	0.02
2002	81	10	107,897	30,888	14,705	534,894	33	8,505	696,722	214,178	18,287	449,994	1,657	1,599	19,678	699,354	(0.09)
2003	82	10	130,854	29,643	14,705	523,416	80	14,236	712,914	157,406	18,400	523,416	1,662	1,779	9,340	712,005	0.03
2004	83	10	112,489	31,662	14,705	514,233	85	9,299	682,472	146,572	18,294	502,755	1,720	1,915	10,808	682,063	0.01
2005	84	10	50,505	34,172	14,705	589,991	100	3,336	692,809	234,294	17,766	415,519	1,770	1,720	21,557	692,626	0.01
2006	85	10	29,844	34,597	14,705	885,592	303	2,321	777,362	294,198	18,530	433,684	2,261	7,519	18,931	775,422	0.06

TABLE 4. MODEL WATER BALANCE (1923 - 2034)
AWC PINAL VALLEY RECHARGE PROJECT USF/WS APPLICATION

			INFLOW							OUTFLOW							
YEAR	stress	time step	STORAGE	CONST HEAD	WELLS	RECHARGE	STREAM LEAKAGE	INTERBED STORAGE	TOTAL INFLOW	STORAGE	CONST HEAD	WELLS	ET	STREAM LEAKAGE	INTERBED STORAGE	TOTAL OUTFLOW	PERCENT ERROR
2007	86	10	61,983	33,867	14,705	631,313	1,309	4,975	748,148	229,686	18,700	482,094	2,350	4,121	14,061	751,013	(0.10)
2008	87	10	68,871	33,120	14,705	670,340	1,163	6,858	795,056	204,740	18,844	548,669	2,202	3,046	13,679	791,180	0.12
2009	88	10	80,349	30,885	14,705	560,147	509	5,068	691,663	152,677	18,896	502,755	2,065	2,186	15,285	693,844	(0.08)
2010	89	10	68,871	29,594	14,705	560,147	131	3,852	677,299	139,098	18,836	502,755	1,979	1,682	12,580	678,930	0.01
2011	90	10	61,983	28,858	14,705	560,147	71	3,905	669,668	132,370	18,830	502,755	1,943	1,555	11,948	668,382	0.01
2012	91	10	57,392	28,309	14,705	560,147	63	4,174	664,789	128,804	18,802	502,755	1,939	1,508	11,596	665,404	(0.02)
2013	92	10	55,096	27,866	14,687	560,147	58	4,263	662,127	125,043	18,812	500,459	1,966	1,440	11,307	659,067	0.12
2014	93	10	48,209	27,491	14,669	569,330	56	3,894	663,648	126,594	18,837	502,755	2,018	1,466	11,538	663,308	0.01
2015	94	10	45,914	27,163	14,669	592,287	56	3,701	683,789	145,348	18,872	502,755	2,092	1,463	12,761	683,292	0.02
2016	95	10	41,322	26,869	14,669	592,287	58	3,337	678,540	140,988	18,916	500,459	2,191	1,469	11,091	677,115	0.05
2017	96	10	39,027	26,598	14,669	592,287	60	3,009	675,649	137,250	18,974	502,755	2,318	1,483	11,157	675,936	(0.01)
2018	97	10	36,731	26,343	14,669	592,287	64	2,756	672,850	133,932	19,043	500,459	2,466	1,503	11,122	670,526	0.09
2019	98	10	34,435	26,100	14,669	592,287	69	2,570	670,130	131,096	19,122	502,755	2,634	1,528	13,054	670,188	(0.00)
2020	99	10	32,140	25,886	14,669	592,287	75	2,423	667,458	128,424	19,209	500,459	2,823	1,558	12,984	665,437	0.08
2021	100	10	29,844	25,639	14,669	592,287	103	2,248	664,790	125,989	19,300	500,459	3,034	1,614	12,845	663,242	0.06
2022	101	10	27,548	25,418	14,669	592,287	216	2,147	662,283	123,641	19,396	502,755	3,278	1,758	12,717	663,546	(0.05)
2023	102	10	25,253	25,201	14,669	594,582	358	1,998	662,080	122,313	19,494	500,459	3,560	1,936	12,603	659,365	0.10
2024	103	10	25,253	24,988	14,669	589,991	551	1,850	657,301	118,782	19,592	500,459	3,869	2,167	13,460	657,328	(0.00)
2025	104	10	22,957	24,779	14,669	592,287	744	1,758	657,193	115,897	19,689	500,459	4,196	2,401	12,256	654,898	0.09
2026	105	10	20,661	24,575	14,669	592,287	910	1,606	654,708	113,686	19,787	500,459	4,537	2,612	12,083	653,165	0.06
2027	106	10	18,365	24,376	14,669	589,991	1,172	1,496	650,069	111,690	19,890	500,459	4,895	2,922	11,922	651,778	(0.07)
2028	107	10	18,365	24,185	14,669	589,991	1,459	1,361	650,029	109,254	20,004	500,459	5,258	3,265	11,750	649,990	0.00
2029	108	10	20,661	24,007	14,669	585,399	1,720	1,323	647,779	104,939	20,136	500,459	5,631	3,594	11,450	646,209	0.06
2030	109	10	16,070	23,844	14,669	585,399	1,740	1,190	642,912	101,917	20,281	498,163	6,013	3,836	11,217	641,427	0.06
2031	110	10	18,365	23,687	14,669	583,104	1,680	1,577	643,081	99,802	20,349	500,459	6,397	3,972	11,014	642,033	0.04
2032	111	10	20,661	23,535	14,669	573,921	1,626	1,767	636,178	92,956	20,483	500,459	6,791	4,093	10,448	636,230	(0.00)
2033	112	10	16,070	23,389	14,669	573,921	1,574	1,515	631,137	89,843	20,568	498,163	7,200	4,208	9,960	629,942	0.05
2034	113	10	20,661	23,246	14,669	569,330	1,525	1,716	631,148	86,960	20,644	500,459	7,623	4,319	9,631	629,636	0.06

Min.	(0.10)
Max.	0.32

TABLE 5
WELL SAMPLING WATER QUALITY RESULTS
PINAL VALLEY RECHARGE PROJECT

Sample ID	ADWR 55-	Analytes												
		Nitrate (N)	Calcium	Chromium	Magnesium	Potassium	Sodium	Arsenic	Chloride	Sulfate	Bicarbonate Alkalinity	Total Alkalinity as CaCO3	Total Dissolved Solids	Fluoride
Sample #1	605353	15.4	395	0.008	53	14	379	<0.005	738	738	165	165	2500	0.79
Sample #2	625224	3.46	84	0.011	12	5	193	0.0116	170	213	212	212	972	1.60
Sample #3	622456	2.31	9	0.044	<1	1	178	0.0185	116	142	59.1	67	506	5.99
Sample #4	621909	6.33	32	0.012	5	3	179	0.0183	173	118	86.0	86	600	5.88
Sample #5	222563	6.41	55	0.008	11	7	250	0.0097	176	231	204	204	920	4.21
Sample #6	625230	8.15	212	<0.005	38	8	225	<0.002	337	408	253	253	1490	0.40
Sample #7	625231	4.05	165	<0.005	30	6	179	0.0017	261	280	272	272	1110	0.48
Sample #8	221958	3.78	28	0.013	3	2	199	0.0289	167	146	104	104	748	6.16
Sample #9	605559	2.28	4	0.039	<1	1	144	0.0169	91.9	87.4	73.1	97	426	4.58

Wells sampled September 18, 2014. See figure for well locations.
15.4 Highlight indicates elevated concentration.

Table 6.
Roto-sonic Boring Water Quality Results
AWC Pinal Valley Recharge Project

Sample ID	Date / Time	Arsenic mg/L	Bicarbonate Alkalinity mg/L	Calcium mg/L	Chloride mg/L	Chromium mg/L	Fluoride mg/L	Magnesium mg/L	Nitrate + Nitrite as N mg/L	Nitrate as N mg/L	Nitrite as N mg/L	Potassium mg/L	Sodium mg/L	Sulfate mg/L	Total Alkalinity as CaCO3 mg/L	Total Dissolved Solids mg/L
B2-RS1-110 (Pinal Recharge Site)	7/16/14 2:55:00 PM	0.0059	160	36.8	109	<	4.32	5	0.92	0.92	<	3	152	78.7	160	588
B2-RS1-120 (Pinal Recharge Site)	7/16/14 3:30:00 PM	0.0029	182	57.7	150	<	3.10	8	1.14	1.14	<	4	168	107	182	688
B2-RS1-130 (Pinal Recharge Site)	7/16/14 4:25:00 PM	0.0015	177	52.4	154	<	3.56	7	0.88	0.88	<	5	178	107	177	736
B2-RS1-140 (Pinal Recharge Site)	7/16/14 5:45:00 PM	0.0016	179	60.8	169	<	3.44	9	0.86	0.86	<	5	197	134	179	532
B2-RS1-150 (Pinal Recharge Site)	7/17/14 7:45:00 AM	0.0012	155	50.7	173	<	3.71	7	1.21	1.11	0.10	5	173	132	155	716
B4-RS2-114 (Pinal Recharge Site)	7/15/14 3:50:00 PM	0.0040	265	79.5	179	0.018	3.57	14	0.43	0.43	<	5	242	138	265	636
B4-RS2-125 (Pinal Recharge Site)	7/15/14 4:45:00 PM	0.0037	201	75.6	180	0.026	3.54	13	0.48	0.48	<	5	206	120	201	584
B4-RS2-135 (Pinal Recharge Site)	7/15/14 5:40:00 PM	0.0014	203	72.1	176	<	3.60	11	0.40	0.40	<	4	192	122	203	620
B4-RS2-150 (Pinal Recharge Site)	7/16/14 8:00:00 AM	0.0011	186	60.9	180	<	3.52	9	0.48	0.48	<	6	197	125	186	732
	MCL	0.01	None	None	250(S)		4	None	10	10	1	None	None	250(S)	None	500(S)

Notes:
mg/L = milligrams per liter
MCL= Maximum comtamination limit of primary drinking water standard
(S) = Secondary Drinking Water Standard

TABLE 7
MONITORING LOCATIONS
AWC PINAL VALLEY RECHARGE PROJECT

Source Water				
Monitor Point ID	**Description**	**Cadastral Location**		
SW-1	Intake Structure	D(6-8) 18DDD		
Groundwater				
Monitor Point ID	**ADWR Registration Number**	**Cadastral Location**	**Depth (feet bls)**	**Screened Interval (feet bls)**
MW-1 (proposed)	tbd	D(6-8) 18BDA	120	70

Notes:
1 - MW-1 is proposed

TABLE 8
WATER LEVEL MONITORING
AWC PINAL VALLEY RECHARGE PROJECT

Monitor Point	ADWR Reg. No.	Cadastral Location	Well Depth (ft bls)	Screen Interval (ft. bls)	Measuring Device	Monitoring Frequency	Reporting Frequency	Alert Level (ft bls)	Operational Prohibition Limit (ft bls)
MW -I (proposed)	tbd	D(6-8) 18BDA	120	50-120	Electric Sounder	Monthly	Annually	20	15

TABLE 9
WATER QUALITY MONITORING
AWC PINAL VALLEY RECHARGE PROJECT

Analyte	Method	Groundwater		Source Water[2]	Monitoring Frequency		Reporting Frequency
		Alert Level (mg/L)	OPL (mg/L)	OPL (mg/L)	First 12 Months	After 12 Months	
Field							
pH	Field	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Specific Conductance	Field	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Temperature	Field	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Inorganic Analytes							
Alkalinity (Total)	310.1	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Alkalinity, Bicarbonate	2320B	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Alkalinity, Carbonate	2320B	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Calcium	200.9	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Chloride	300	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Fluoride	300	Reserved[1]	Reserved[1]	4.0	Every 3 Months	Every 6 Months	Annually
Nitrate (as N)	300	Reserved[1]	Reserved[1]	10	Every 3 Months	Every 6 Months	Annually
Potassium	6010A	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Sodium	273.1	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Sulfate	300	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Total Dissolved Solids	2540C	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Trace Metals							
Aluminum	6010A	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Antimony	200.9	0.0048	0.006	0.006	Every 3 Months	Every 6 Months	Annually
Arsenic	200.9	0.04	0.05	0.05	Every 3 Months	Every 6 Months	Annually
Barium	200.7	1.6	2	2	Every 3 Months	Every 6 Months	Annually
Beryllium	200.7	0.0032	0.004	0.004	Every 3 Months	Every 6 Months	Annually
Cadmium	200.7	0.004	0.005	0.005	Every 3 Months	Every 6 Months	Annually
Chromium	200.7	0.08	0.1	0.1	Every 3 Months	Every 6 Months	Annually
Copper	200.7	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Iron	200.7	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Lead	200.9	0.04	0.05	0.05	Every 3 Months	Every 6 Months	Annually
Magnesium	200.7	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Manganese	200.7	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Mercury	245.1	0.0016	0.002	0.002	Every 3 Months	Every 6 Months	Annually
Nickel	200.9	0.08	0.1	0.1	Every 3 Months	Every 6 Months	Annually
Selenium	200.9	0.04	0.05	0.05	Every 3 Months	Every 6 Months	Annually
Silver	6010A	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Thallium	200.9	0.0016	0.002	0.002	Every 3 Months	Every 6 Months	Annually
Zinc	200.7	NA	NA	NA	Every 3 Months	Every 6 Months	Annually
Microbiological							
Total Coliform	9221A	NA	Repeat Positive	Repeat Positive	Every 3 Months	Every 6 Months	Annually

Notes:
1 - The Alert Levels and OPLs for fluoride and nitrate in groundwater will be calculated after the first 4 sampling events and submitted to ADWR for approval.
2 - there is no Alert Level for the source water.

TABLE 10
WATER QUANTITY MONITORING
AWC PINAL VALLEY RECHARGE PROJECT

Monitor Point ID	Location	Latitude	Longitude	Monitoring Frequency	Reporting Frequency
Meter A				Weekly	Annually

Appendix A

DRILLERS LOG SUMMARY FOR SECTION A-A' AND B-B' ON FIGURE 5 AND FIELD INVESTIGATION BORING LOGS

CADASTRAL	INTERVAL	DESCRIPTION
(D-06-08) 24ada	0 - 10	top soil
	10 - 180	silty sand
	180 - 490	sandy clay
	490 - 1,390	silty clay
	1,390 - 1,570	silty to sandy clay
	1,570 - 1,760	clayey silt
	1,760 - 1,850	brownish silty sand & gravel
(D-06-09) 06dcd	0 - 10	decomposed granite
	10 - 20	top soil
	20 - 70	caliche, sand & some clay
	70 - 90	sand, some gravel & clay
	90 - 120	sandy clay & some gravel
	120 - 135	sandy clay, sand stone with hard streaks (water @ 130')
	135 - 140	decomposed granite quartz
	140 - 150	sandy clay
	150 - 155	dark fine sand
	155 - 187	sandy clay with hard sandstone streaks
	187 - 203	red clay & some sand
	203 - 222	fine sandy clay
	222 - 255	red clay & gravel
	255 - 259	broken quartz & hard caliche
	259 - 292	red clay & some sand
	292 - 295	red, hard shale
	295 - 324	red clay
	324 - 329	red shale
	329 - 356	red clay
	356 - 360	red shale & sandstone
	360 - 435	red clay & hard streaks of clay shale
	435 - 490	red clay shale & sandstone
	490 - 518	red clay
	518 - 575	red clay shale & sandstone
	575 - 720	silty clay
	720 - 726	silty clay & sandstone
	726 - 778	silty clay
	778 - 796	brown clay shale
	796 - 874	silty clay
	874 - 910	silt, fine sand & clay
	910 - 944	fine sand clay sandstone & broken quartz
	944 - 995	clay
	995 - 1,050	sandy clay, hard streaks with some gravel & sandstone
(D-06-09) 07caa	0 - 30	clay
	30 - 50	sand
	50 - 155	clay
	155 - 160	sand
	160 - 165	clay
	165 - 175	sand & water
	175 - 295	clay
	295 - 305	hard sand
	305 - 325	clay
	325 - 335	hard sand
	335 - 789	clay
	789 - 792	sand
	792 - 925	clay
	925 - 1,045	clay & sand in streaks of about 5' each
	1,045 - 1,055	hard abasive sand
	1,055 - 1,060	hard clay
	1,060 - 1,077	hard abrasive cemented sand

CADASTRAL	INTERVAL	DESCRIPTION
(D-06-09) 07cdd	0 - 20	sand, clay & caliche
	20 - 45	clay
	45 - 55	sand
	55 - 65	cement
	65 - 445	light clay
	445 - 460	cement sand
	460 - 770	clay
	770 - 1,045	clay, fine sand & silt
	1,045 - 1,140	clay, clay shale & sand
	1,140 - 1,210	gravel
	1,210 - 1,600	gravel with strata of clay
(D-06-09) 18bad	0 - 10	top soil
	10 - 50	sandy clay
	50 - 60	sand & gravel
	60 - 220	clay
	220 - 240	sand & gravel
	240 - 450	clay
	450 - 470	sandstone
	470 - 1,150	clay
	1,150 - 1,160	sand & gravel
	1,160 - 1,170	clay
	1,170 - 1,260	sand & gravel
	1,260 - 1,275	clay
	1,275 - 1,440	sand & gravel
(D-06-09) 18bda	0 - 47	sandy clay
	47 - 63	coarse sand
	63 - 105	sandy clay
	105 - 115	coarse sand
	115 - 133	sandy clay with small strata of sand
	133 - 144	gravel & boulders
	144 - 170	cemented shell and jointed clay
	170 - 255	clay
	255 - 263	sand & gravel
	263 - 1,095	silty clay
	1,095 - 1,402	conglomerate of clay, sand & gravel
(D-06-09) 30aac	0 - 22	silt & dry clay
	22 - 115	dry clay
	115 - 210	silty clay
	210 - 390	clay with some gravel & silt
	390 - 450	sticky clay
	450 - 460	clay, some grave & coarse sand
	460 - 473	clay
	473 - 495	sticky clay
	495 - 505	dry clay
	505 - 517	clay shale
	517 - 531	brown sticky clayq
	531 - 537	clay & fine sandq
	537 - 550	sticky clay
	550 - 580	dry clay
	580 - 582	sand

CADASTRAL	INTERVAL	DESCRIPTION
	582 - 586	red sticky clay
	586 - 595	silty clay
	595 - 600	clay & sand
	600 - 615	brown clay
	615 - 621	light brown sticky clay
	621 - 630	sticky clay
	630 - 640	clay & silt
	640 - 695	dry, hard clay
	695 - 710	sticky clay
	710 - 715	dry hard clay
	715 - 736	sticky clay
	736 - 812	dry, hard clay
	812 - 821	clay & some sand
	821 - 841	sticky clay
	841 - 885	dry, hard clay
	885 - 893	dry, hard clay
	893 - 906	hard clay shale
	906 - 919	silty clay
	919 - 925	sticky clay
	925 - 940	red clay
	940 - 978	silty clay
	978 - 1,005	sticky clay
(D-06-09) 33bad	0 - 50	silt & sand
	50 - 176	sand & gravel
	176 - 267	clay with sand streaks
	267 - 300	boulders
	300 - 427	sand with clay streaks
	427 - 500	sand & gravel
	500 - 575	clay
	575 - 650	sand & gravelq
	650 - 758	sand & gravel with clay streaks
	758 - 770	clay
	770 - 950	sand & gravel with clay streaks
	950 - 1,085	sand & gravel
	1,085 - 1,100	clay
(D-07-08) 25ccc	0 - 100	sand
	100 - 180	gravel
	180 - 200	clay
	200 - 260	gravel
	260 - 380	sand
	380 - 400	gravel
	400 - 440	sand
	440 - 470	silt
	470 - 500	sand
	500 - 520	silt
	520 - 580	sand
	580 - 620	clay
	620 - 680	sand
	680 - 710	clay
	710 - 770	sand
	770 - 860	silt
	860 - 930	sand
	930 - 960	clay
	960 - 1,020	sand
	1,020 - 1,400	silt and clay
	1,400 - 1,944	clay

Data Source:

Montgomery & Associates, Inc. Feb. 2009. Report. Recovery Wellfield Siting Study Phase 1 Pinal County, Arizona. Prepared for Central Arizona Project.

ADWR Wells-35 Registry Database.

Project No. 011010
Project Name: Pinal Recharge Site.

Well/Boring: B4-RS2
Page 1 of 2

Project No.: 011010	Well/Boring Name: B4-RS2		* Percentages of fines, sand, & gravels based on visual estimates of volume
Project Name: Pinal Recharge Project	Date/ Time Started: 7/15/14		■ Relative % fines (F < 0.075 mm; No. 200 sieve)
ADWR Number:	Date/Time Completed: 7/16/14		
Location Cadastral:	Drilling Equipment:		
Location NAD 83:	Drilling Method: Rotosonic		□ Relative % sand (S > 0.075 < 4.75 mm)
Drill Company: Cascade	Bit Size/Type:		
Driller(s): Brighm	Conductor Casing (type; diameter; depth):		▨ Relative % gravel (G > 4.75 mm; No. 4 sieve)
Logged By: TL	Total Borehole Depth:		

Depth (feet)	* Est. % F	S	G	* Est. % F S G	Drill Rate (ft/hr)	PID	~~Blows per foot~~ NCL	Munsell Color / Recovery	Sample Description	Remarks
10	65	30	5		20		Lite	7.5YR 4/6 Strong Brown	Sandy Silt w/Trace Gravel: Loose, Dry, Silt no stickyness, no plasticity. Sand fine to course, SA to SR, mod sorted, composed of qtz, (felsic), Gravel up to 1.2cm, Angular, (felsic) composed of qtz and metamorphics.	
20	80	15	5		40		mod	7.5YR 5/4 Brown	Silt w/Sand and Gravel: Loose, Dry, Silt no stickyness, no plasticity, Sand fine to course SA to SR, poorly sorted, composed of qtz, (felsic), Gravel up to 1cm, SA, Same lithology as Sand.	
30	85	15	Ø		40		mod	7.5YR 5/4 Brown	SAME AS ABOVE: Low amount of clay present decrease In gravel.	
40	80	20	Ø		40		mod	7.5YR 4/4 Brown	Sandy Silty/Clay: Loose, dry, Fines predom silt, Low stickyness no plasticity. Sand fine to coarse, SA to SR, mod sorted, Composed of qtz, (felsic).	~30 - 32 Sandy lense
50	90	10	Ø		40		mod	7.5YR 4/4 Brown	SAME AS ABOVE:	
60	95	5	Ø		45		mod	7.5YR 4/4 Brown	Silt/Clay with Sand: Loose to hard clumps, dry, Fines form hard clumps, mostly silt, Low stickyness no plasticity. Sand fine to coarse, SA to SR, Poorly sorted, composed of qtz, (felsic).	
70	90	5	5		40		mod	7.5YR 4/4 Brown	SAME AS ABOVE! Gravel present, up to 0.6cm SA to SR, Composed of qtz,	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Final Recharge Project.

Well/Boring: B4-RS2
Page 2 of 2

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Drill Rate (ft/hr)	PID	~~Blows per foot~~ HCL	Munsell Recovery Color	Sample Description	Remarks
80	90	5	5		30		mod	7.5YR 4/4 Brown	Silt/Clay w/ sand and Gravel: Loose to hard clumps Fines predom silt, Low stickyness, No plasticity. Sand fine to Coarse, SA to SR, Poorly sorted Composed of qtz, (Felsic), Gravel up to 1cm, SA to SR, Composed of qtz.	
90	85	10	5		30		mod	7.5YR 4/4 Brown	SAME AS ABOVE: Increase In Sand	
100	95	5	Ø		30		Lite	7.5YR 4/6 Strong Brown	SAME AS ABOVE: Decrease In Gravel	
110	99	T	Ø		40		none	7.5YR 4/6 Strong Brown	Silt with Trace Sand and Clay: Loose to blocky clumps, wet, fines predom silt, No stickyness Low plasticity, Sand Is fine to ~~coarse~~ medium, mod sorted, SA to SR, composed of qtz.	Hit water @ 104'
120	99	T	Ø		40		none	7.5YR 4/6 Strong Brown	SAME AS ABOVE:	
130	90	10	Ø		40		none	7.5YR 5/4 Brown	SAME AS ABOVE: Increase In Sand	~ 128-131 Sandy Layer
140	95	5	Ø		40		vlite	7.5YR 5/4 Brown	SAME AS ABOVE: Decrease In Sand.	
150	95	5	Ø		40		vlite	7.5YR 5/4 Brown	Same AS ABOVE:	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Site

Well/Boring: B2-RS1
Page 1 of 2

Project No.: 011010		Well/Boring Name: B2-RS1	* Percentages of fines, sand, & gravels based on visual estimates of volume
Project Name: Pinal Recharge Project		Date/ Time Started: 7/16/14	■ Relative % fines (F < 0.075 mm; No. 200 sieve)
ADWR Number:		Date/Time Completed: 7/17/14	
Location Cadastral:		Drilling Equipment:	
Location NAD 83:		Drilling Method: Roto Sonic	□ Relative % sand (S > 0.075 < 4.75 mm)
Drill Company: Cascade		Bit Size/Type:	
Driller(s): Bringham		Conductor Casing (type; diameter; depth):	▨ Relative % gravel (G > 4.75 mm; No. 4 sieve)
Logged By: TL		Total Borehole Depth: 150'	

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Drill Rate (ft/hr)	PID	~~HCL Blows per foot~~	Munsell Recovery Color	Sample Description	Remarks
10	80	20	T		40		mod	7.5YR 4/6 Strong Brown	Sandy Silt/Clay w/ Trace Gravel: Loose, dry. Fines predom silt, Low stickyness, low plasticity. Sand Is fine to Coarse, SA to SR, Poorly sorted, composed of qtz and mafic volcanics (felsic). Gravel up to 1cm, SA, composed of qtz, (felsic). Clumps of Caliche present	
20	80	20	T		40		mod	7.5YR 5/4 Brown	Same As Above: Color change.	
30	80	15	5		30		mod	7.5YR 5/4 Brown	Same As Above: Gravel present up to 1.5 cm, Angular to SA, composed of qtz and basalt, (felsic)	
40	40	50	10		25		mod	7.5YR 6/4 Light Brown	Silty Sand w/Gravel: Loose, dry, Sand fine to coarse, poorly sorted, SA to SR, Composed of qtz and metamorphics, (felsic) mostly qtz, Gravel up to 1.7cm, SA, composed of qtz mod sorted.	B2-38' ~ Alternating layers of sand/gravel and silt.
50	85	10	5		30		mod	7.5YR 5/4 Brown	Sandy Silt/clay w/gravel: Loose, dry, Fines are predom silt, Low stickyness, Low plasticity. Sand fine to Coarse, SA to SR, Predom qtz with metamorphics. Gravel up to 1cm, SA to SR mod sorted,	
60	55	40	5		30		mod	7.5YR 5/4 Brown	Sandy and Silty/Clay w/gravel: Loose, dry, Fines are predom silt, Low stickyness, Low plasticity. Sand fine to Coarse, SA to SR, poorly sorted, composed of qtz, metamorphics, Jasper, (felsic). Gravel up to 1cm, SA to SR, mod sorted Same lithology as Sand.	~ 52-53 - Sandy lense
70	80	15	5		40		mod	7.5YR 5/4 Brown	Sandy Silt/Clay w/Gravel: Fines predom silt, Low stickyness, Low plasticity. Sand fine to Coarse SA to SR, Poorly sorted, composed of qtz, metamorphics granite, mostly qtz, felsic. Gravel up to 1.6cm, SA to SR, mod sorted, Same lithology as Sand.	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project

Well/Boring: B2-RS1
Page 2 of 2

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Drill Rate (ft/hr)	PID	~~Blows per foot~~ HCL	~~Munsell Recovery Color~~	Sample Description	Remarks
80	80	15	5		40		mod	7.5YR 5/6 Strong Brown	Sandy Silt/Clay w/ Gravel: Loose to hard Clumps, moist, Fines predom silt, Low stickyness Low plasticity. Sand fine to Coarse, SA to SR mod sorted, composed of qtz, metamorphics and Jasper, Felsic, Gravel up to 0.8cm, SA to SR, Same lithology as sand.	
90	80	15	5		40		mod	7.5YR 5/6 Strong Brown	SAME AS ABOVE;	
100	95	5	Ø		40		Ulite	7.5YR 5/6 Strong Brown	Silt/Clay with Sand: Loose to hard clumps, Fines predom silt, Low stickyness, Low plasticity. Sand is fine to Coarse, SA to SR, poorly sorted composed of qtz.	
110	95	5	Ø		25		none	7.5YR 5/6 Strong Brown	SAME AS ABOVE: Increase In clay content, mod plasticity, low stickyness.	~ Hit water @ 104'
120	99	T	Ø		25		none	7.5YR 5/6 Strong Brown	SAME AS ABOVE: Decrease In sand	
130	25	65	10		20		none	7.5YR 6/4 Light Brown	Silty/Clayey Sand with Gravel: Loose, wet, Sand fine to Coarse, SA to SR, poorly sorted, Composed of qtz, qtzite, volanics, granite, (Intermediate) Gravel up to 3cm, SA to SR, poorly sorted, Same lithology as sand.	~126-129' Sandy lense visable
140	30	50	20		20		slight	7.5YR 6/6 Reddish Yellow	SAME AS ABOVE: Increase In clay and Gravel	
150	[illegible]	Ø	Ø		20		slight	7.5YR 5/6 Strong Brown	Silt/Clay: Soft to hard clumps; wet, Silt clay mixture, Low stickyness, Low plasticity.	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project

Well/Boring: Basin 1
Page 1 of 1

Project No.: 011010	Well/Boring Name: Basin 1
Project Name: Pinal Recharge Project	Date/ Time Started: 7/9/14 1605
ADWR Number:	Date/Time Completed: 7/9/14 1640
Location Cadastral:	Drilling Equipment:
Location NAD 83:	Drilling Method: Auger
Drill Company: GSI	Bit Size/Type: 3"
Driller(s): Tim	Conductor Casing (type; diameter; depth):
Logged By: TC	Total Borehole Depth: 30'

* Percentages of fines, sand, & gravels based on visual estimates of volume
■ Relative % fines (F < 0.075 mm; No. 200 sieve)
□ Relative % sand (S > 0.075 < 4.75 mm)
▨ Relative % gravel (G > 4.75 mm; No. 4 sieve)

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Drill Rate (ft/hr)	PID	Blows per foot	~~Hole Recovery~~	Sample Description	Remarks
5	95	5	Ø		7.5YR 4/6 strong Brown		5 36 28	mod	Silt w/sand: Loose, dry; No plasticity slight stickyness. Sand, fine to coarse, poorly sorted, SA to SR, predom felsic (qtz), Caliche stringers (veins) and chips.	
10	95	5	Ø		7.5YR 5/4 Brown		15 16 19	high	Same As Above: Color change	
15	99	T	Ø		7.5YR 5/4 Brown		21 35 50 for 3"	high	Same As Above: Increase In caliche Chips, Decrease In sand.	
20	99	T	Ø		7.5YR 5/4 Brown		19 50 for 6"	high	Same As Above: Slight clay present ↓ (Red brown)	
25	99	T	Ø		7.5YR 5/4 Brown		23 42 50 for 4"	high	Same As Above:	
30	99	T	Ø		7.5YR 5/4 Brown		16 21 26	high	Same As Above	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project

Well/Boring: Basin 3
Page 1 of 1

Project No.: 011010 Pinal Recharge Project		Well/Boring Name: Basin 3	
Project Name:		Date/ Time Started:	
ADWR Number:		Date/Time Completed:	
Location Cadastral:		Drilling Equipment:	
Location NAD 83:		Drilling Method: Auger	
Drill Company: GSI		Bit Size/Type:	
Driller(s): Tim		Conductor Casing (type; diameter; depth):	
Logged By: TL		Total Borehole Depth: 30'	

* Percentages of fines, sand, & gravels based on visual estimates of volume
- Relative % fines (F < 0.075 mm; No. 200 sieve)
- Relative % sand (S > 0.075 < 4.75 mm)
- Relative % gravel (G > 4.75 mm; No. 4 sieve)

Depth (feet)	*Est. % F	S	G	*Est. % F S G	Drill Rate (ft/hr)	PID	Blows per foot	Recovery	Sample Description	Remarks
5	90	10	Ø	[redacted]	7.5YR 4/6 Strong Brown		6 9 14	mod	Silt w/sand: Loose, dry, Silt no stickyness, no plasticity. Sands SA to SR, fine to med, Poorly sorted predom felsic (qtz), Caliche clumps present	
10	95	5	Ø	[redacted]	7.5YR 5/4 Brown		10 13 18	mod	Same As Above: Decrease In Sand, Clay present predom Silt still.	
15	95	5	Ø	[redacted]	7.5YR 5/4		24 42 28	mod	Same As Above: Color change.	
20	65	35	Ø	[redacted]	7.5YR 4/6 Strong Brown		10 17 21	mod	Sandy Silt: loose, moist, Silt has no stickyness and no plasticity. Sand, fine to coarse SA to SR, poorly sorted, predom felsic (qtz, granite volcanics)	
25	95	5	Ø	[redacted]	7.5YR 5/4 Brown		16 23 29	high	Silt/ w/sand: loose to wind clumps, moist, Silt has no stickyness, no plasticity. Sand SA to SR, poorly sorted, fine to medium, felsic dominated (qtz). Caliche clumps present	
30	95	5	Ø	[redacted]	7.5YR 5/4 Brown		16 28 38	high	Same As Above: Small amount of clay present, Still predom silt.	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project.

Well/Boring: _____
Page 1 of 1

Project No.: 011010	Well/Boring Name: Basin 5	* Percentages of fines, sand, & gravels based on visual estimates of volume	
Project Name: Pinal Recharge Project.	Date/ Time Started:		
ADWR Number:	Date/Time Completed: 0910	■ Relative % fines (F < 0.075 mm; No. 200 sieve)	
Location Cadastral:	Drilling Equipment:		
Location NAD 83:	Drilling Method:	□ Relative % sand (S > 0.075 < 4.75 mm)	
Drill Company: GSI	Bit Size/Type:		
Driller(s): Tim	Conductor Casing (type; diameter; depth):	▨ Relative % gravel (G > 4.75 mm; No. 4 sieve)	
Logged By: TC	Total Borehole Depth: 30'		

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Munsell Color / Drill Rate (ft/hr)	PID	Blows per foot	HCL ~~Recovery~~	Sample Description	Remarks
5	95	5	Ø	[redacted]	7.5YR 4/6 Strong brown		27 28 24	mod	Silt/Clay mixture w/sand: loose, dry Fines are slightly plastic w/ slight stickyness Sand fine to coarse, sub angular to sub round, Poorly sorted, prelom felsic (ctz/grains)	
10	90	10	Ø	[redacted]	7.5YR 4/6		21 26 24	mod	Same As Above: Increase In Sand	
15	90	10	Ø	[redacted]	7.5YR 5/4 Brown		27 30 24	mod	Same As Above: Slight change In color, Small white clumps of clay	
20	70	30	Ø	[redacted]	7.5YR 5/4		5 6 5	mod	Sandy Silt/Clay: loose, ~~moist~~, to slightly hard clumps moist, Fines. slightly plasticity with slight stickiness. Sand. fine to coarse Angular to sRounded, Poorly sorted, prelom felsic (ctz, granite fragments, biotite fragments)	
25	95	5	Ø	[redacted]	7.5YR 5/4		30 50 for 5"	mod	Silt/Clay mixture w/sand: loose, moist, slightly hard. Fines have slight plasticity slight stickiness, Sand fine to coarse poorly sorted. SA to SR, prelom felsic	
30	95	5	Ø	[redacted]	7.5YR 5/4		32 50 for 6"	mod.	SAME AS ABOVE:	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project

Well/Boring: PZ-Basin 2
Page 1 of 1

Project No.: 011010	Well/Boring Name: PZ-Basin 2, Basin 2
Project Name: Pinal Recharge Project	Date/ Time Started:
ADWR Number:	Date/Time Completed:
Location Cadastral:	Drilling Equipment:
Location NAD 83:	Drilling Method: Auger
Drill Company: CSI	Bit Size/Type:
Driller(s): Tim	Conductor Casing (type; diameter; depth):
Logged By: TZ	Total Borehole Depth: 30'

* Percentages of fines, sand, & gravels based on visual estimates of volume
- Relative % fines (F < 0.075 mm; No. 200 sieve)
- Relative % sand (S > 0.075 < 4.75 mm)
- Relative % gravel (G > 4.75 mm; No. 4 sieve)

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	Drill Rate (ft/hr)	PID	Blows per foot	Recovery	Sample Description	Remarks
5	99	T	Ø		7.5YR 4/6 Strong Brown		13 21 23	mod	Silt w/ Trace Sand: Loose, dry, slight stickiness, no plasticity, Sand fine to medium. SA to SR, Rel size (light)	
10	99	T	Ø		7.5YR 5/4 Brown		9 29 42	mod	Same As Above: Caliche clumps present.	
15	99	T	Ø		7.5YR 5/4 Brown		14 38 40	high	Same As Above:	
20	99	T	Ø		7.5YR 4/6 Strong Brown		25 50 for 6"	high	Same As Above: Slight amount of Red-brown Clay balls.	- Clay Present ↓
25	95	5	Ø		7.5YR 4/6 Strong Brown		23 50 for 4"	mod	Same As Above: Increase sand Clay Increase, slight plasticity and stickiness.	
30	95	5	Ø		7.5YR 5/4 Brown		20 21 22	mod.	Same As Above:	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Project No. 011010
Project Name: Pinal Recharge Project

Well/Boring: PZ-Basin 4
Page 1 of 1

Project No.: 011010	Well/Boring Name: Basin 4, PZ-Basin 4		* Percentages of fines, sand, & gravels based on visual estimates of volume
Project Name: Pinal Recharge Project	Date/ Time Started:		■ Relative % fines (F < 0.075 mm; No. 200 sieve)
ADWR Number:	Date/Time Completed: 1040		☐ Relative % sand (S > 0.075 < 4.75 mm)
Location Cadastral:	Drilling Equipment:		▨ Relative % gravel (G > 4.75 mm; No. 4 sieve)
Location NAD 83:	Drilling Method: Auger		
Drill Company: GSI	Bit Size/Type:		
Driller(s): Tim	Conductor Casing (type; diameter; depth):		
Logged By: TZ	Total Borehole Depth: 30'		

Depth (feet)	* Est. % F	* Est. % S	* Est. % G	* Est. % F S G	~~Drill Rate (ft/hr)~~ Moisture Color	PID	Blows per foot	Recovery	Sample Description	Remarks
5	90	7	0		7.5YR 4/6 Strong Brown		6 9 14	med	Silt/Clay mixture fine to med loose Sandy, Fines predom silt, low plasticity, slight stickiness. Sand fine to med, SA to SR, mod sorted. Predom felsic	
10	80	15	5		7.5YR 4/6		10 10 16	med	Sandy Silt w/ gravel: loose, dry to moist, Fines w/ low plasticity, slight stickiness, Sand fine to coarse, SA to SR, Poorly sorted, predom felsic (qtz, granite, basalt). Gravel, Angular up to 5mm.	
15	80	20	0		7.5YR 4/6 Brown		16 25 25	med	Same As Above: Decrease gravel to 0	
20	80	20	0		7.5YR 5/4 Brown		17 30 42	Low	Same As Above:	
25	75	25	0		7.5YR 5/4 Brown		9 22 26	Low	Sandy Silt/Clay: loose moist, Fines low plasticity, slight stickiness, Sand fine to coarse, SA to SR, Poorly sorted, comprised of felsic, basalt, granite). predom felsic.	
30					7.5YR 4/6 Strong Brown		14 19 30	med.	Same As Above:	

Notes: Classification System: Unified Soil Classification System (USCS)

CLEAR CREEK ASSOCIATES

Appendix B

GEOTECHNICAL ANALYSES

SPEEDIE AND ASSOCIATES
Geotechnical ▪ Environmental ▪ Materials Engineers
3331 EAST WOOD STREET • PHOENIX, ARIZONA 85040

LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422346
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Lean Clay — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 5' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	100	
#10 / 2.00	100	
#16 / 1.18	99	
#30 / .600	98	
#40 / .425	97	
#50 / .300	96	
#100 / .150	93	
#200 / .075	87.0	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	24	
Plastic Limit	14	
Plasticity Index	10	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

Reviewed by Brandon Wong
Laboratory Manager

Copies to: Addressee (1)

SPEEDIE AND ASSOCIATES
Geotechnical ▪ Environmental ▪ Materials Engineers
3331 EAST WOOD STREET • PHOENIX, ARIZONA 85040

LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422347
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Sandy Lean Clay — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 10' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	99	
#10 / 2.00	99	
#16 / 1.18	98	
#30 / .600	95	
#40 / .425	94	
#50 / .300	91	
#100 / .150	83	
#200 / .075	69.3	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	24	
Plastic Limit	15	
Plasticity Index	9	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

Reviewed by
Laboratory Manager

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Geotechnical ▪ Environmental ▪ Materials Engineers
3331 EAST WOOD STREET • PHOENIX, ARIZONA 85040

LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422348
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Sandy Lean Clay — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 15' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	99	
#10 / 2.00	99	
#16 / 1.18	97	
#30 / .600	93	
#40 / .425	90	
#50 / .300	86	
#100 / .150	76	
#200 / .075	65.2	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	28	
Plastic Limit	14	
Plasticity Index	14	

Comments: NT denotes material not tested for this property.

• denotes material out of specification.

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

Reviewed by Brenda Wong
Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422349
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Clayey Sand — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 20' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	99	
#8 / 2.36	98	
#10 / 2.00	97	
#16 / 1.18	93	
#30 / .600	87	
#40 / .425	83	
#50 / .300	78	
#100 / .150	64	
#200 / .075	49.7	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	27	
Plastic Limit	14	
Plasticity Index	13	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422350
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Sandy Lean Clay — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 25' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	99	
#8 / 2.36	97	
#10 / 2.00	96	
#16 / 1.18	92	
#30 / .600	86	
#40 / .425	83	
#50 / .300	78	
#100 / .150	68	
#200 / .075	56.5	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	30	
Plastic Limit	14	
Plasticity Index	16	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

Reviewed by Brandon Wong
Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422351
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Sandy Lean Clay — Sampled By: Client — Date: 07-09-14
Source/ID: Boring No. 2 @ 30' — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	99	
#10 / 2.00	98	
#16 / 1.18	95	
#30 / .600	89	
#40 / .425	87	
#50 / .300	82	
#100 / .150	72	
#200 / .075	60.6	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	31	
Plastic Limit	16	
Plasticity Index	15	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422352
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Clayey Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S1A — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	99	
#10 / 2.00	98	
#16 / 1.18	94	
#30 / .600	86	
#40 / .425	80	
#50 / .300	74	
#100 / .150	58	
#200 / .075	43.9	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422353
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Sandy Silty Clay — Sampled By: Client — Date: 07-09-14
Source/ID: S1B — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	99	
#10 / 2.00	98	
#16 / 1.18	95	
#30 / .600	89	
#40 / .425	84	
#50 / .300	77	
#100 / .150	64	
#200 / .075	52.3	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	20	
Plastic Limit	13	
Plasticity Index	7	

Comments: NT denotes material not tested for this property.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422354
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S2A — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	99	
#8 / 2.36	96	
#10 / 2.00	94	
#16 / 1.18	89	
#30 / .600	81	
#40 / .425	76	
#50 / .300	71	
#100 / .150	57	
#200 / .075	42.2	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	16	
Plastic Limit	14	
Plasticity Index	2	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Reviewed by Brandon Wong
Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422355
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S2B — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	99	
#8 / 2.36	95	
#10 / 2.00	91	
#16 / 1.18	78	
#30 / .600	63	
#40 / .425	56	
#50 / .300	48	
#100 / .150	33	
#200 / .075	22.9	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Reviewed by Brandon Vong
Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422356
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S3A — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	99	
⅜ / 9.5	98	
¼ / 6.3	98	
#4 / 4.75	97	
#8 / 2.36	93	
#10 / 2.00	91	
#16 / 1.18	84	
#30 / .600	75	
#40 / .425	70	
#50 / .300	63	
#100 / .150	50	
#200 / .075	37.7	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422357
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S3B — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	99	
#4 / 4.75	98	
#8 / 2.36	93	
#10 / 2.00	90	
#16 / 1.18	82	
#30 / .600	73	
#40 / .425	68	
#50 / .300	62	
#100 / .150	51	
#200 / .075	39.2	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	16	
Plastic Limit	13	
Plasticity Index	3	

Comments: NT denotes material not tested for this property.

* *denotes material out of specification.*

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422358
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S4A — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	99	
#4 / 4.75	99	
#8 / 2.36	94	
#10 / 2.00	92	
#16 / 1.18	86	
#30 / .600	78	
#40 / .425	74	
#50 / .300	69	
#100 / .150	57	
#200 / .075	43.5	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Laboratory Manager

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LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422359
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S4B — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	100	
#8 / 2.36	98	
#10 / 2.00	96	
#16 / 1.18	90	
#30 / .600	81	
#40 / .425	76	
#50 / .300	70	
#100 / .150	57	
#200 / .075	44.5	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	17	
Plastic Limit	14	
Plasticity Index	3	

Comments: NT denotes material not tested for this property.

• denotes material out of specification.

Laboratory test results reported herein apply only to the specific sample on which the test was run. The above services and report were performed pursuant to the terms and conditions of the agreement or proposal, if any, between SA and client. SA warrants that this work was performed under the appropriate standard of care, including the skill and judgement that is reasonably expected from similarly situated professionals. No other warranty, guaranty, or representation, either express or implied is included or intended.

Reviewed by Brandon Wong
Laboratory Manager

Copies to: Addressee (1)

SPEEDIE AND ASSOCIATES
Geotechnical ▪ Environmental ▪ Materials Engineers
3331 EAST WOOD STREET • PHOENIX, ARIZONA 85040

LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422361
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S5A — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	99	
¼ / 6.3	97	
#4 / 4.75	96	
#8 / 2.36	89	
#10 / 2.00	87	
#16 / 1.18	79	
#30 / .600	68	
#40 / .425	62	
#50 / .300	55	
#100 / .150	42	
#200 / .075	29.4	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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Reviewed by Brandon Wovey
Laboratory Manager

Copies to: Addressee (1)

SPEEDIE AND ASSOCIATES
Geotechnical ■ Environmental ■ Materials Engineers
3331 EAST WOOD STREET • PHOENIX, ARIZONA 85040

LABORATORY REPORT

Physical Properties of Soil and Aggregate

Client: Clear Creek Associates, PLC
ATTN: Tyler Levos
6155 E. Indian School, Suite 200
Scottsdale, AZ, 85251

Project No. 141101LA
Lab No. 422362
Field No. N/A
Report Date: 7/25/2014

Project: Pinal County Recharge Site
Location: Pinal County Recharge Site
Material: Silty, Clayey Sand — Sampled By: Client — Date: 07-09-14
Source/ID: S5B — Submitted By: Client — Date: 07-11-14
Supplier: Unknown — Authorized By: Client — Date: 07-11-14
Sample Location: Not Available

SIEVE ANALYSIS - ASTM C 136 & D 1140

SIEVE SIZE in/mm	CUMULATIVE % PASSING	PROJECT SPECIFICATION
6 / 150.0	100	
3 / 75.0	100	
2½ / 62.5	100	
2 / 50.0	100	
1½ / 37.5	100	
1 / 25.0	100	
¾ / 19.0	100	
½ / 12.5	100	
⅜ / 9.5	100	
¼ / 6.3	100	
#4 / 4.75	99	
#8 / 2.36	96	
#10 / 2.00	94	
#16 / 1.18	86	
#30 / .600	78	
#40 / .425	75	
#50 / .300	71	
#100 / .150	61	
#200 / .075	49.1	

ADDITIONAL TESTING

PHYSICAL PROPERTIES	RESULTS	TARGET/ SPECIFICATION
LIQUID & PLASTIC PROPERTIES, ASTM D 4318		
Liquid Limit	22	
Plastic Limit	17	
Plasticity Index	5	

Comments: NT denotes material not tested for this property.

* denotes material out of specification.

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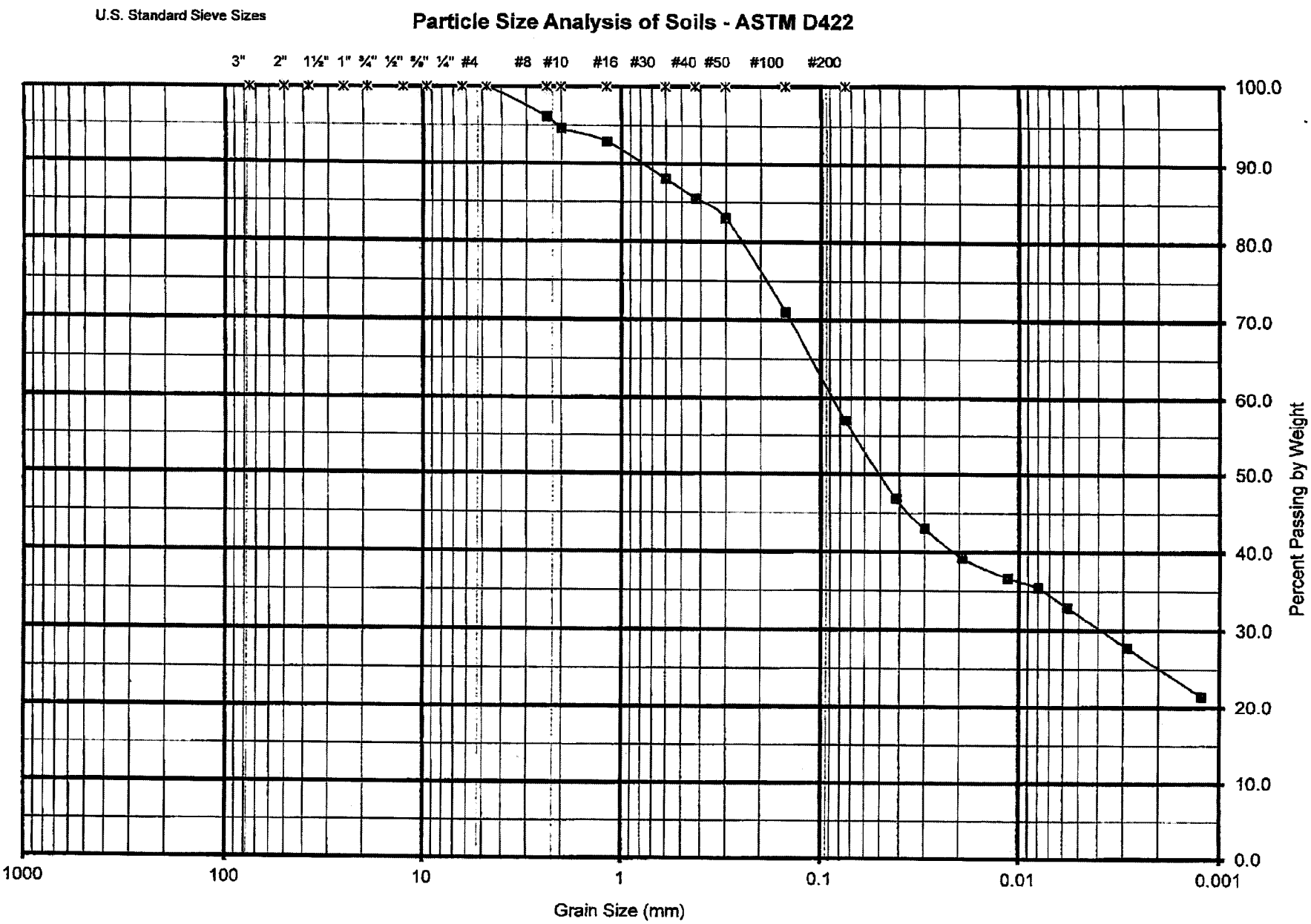
Reviewed by Brandon Wong
Laboratory Manager

Copies to: Addressee (1)



422363- Hydrometer.xls

Appendix D

ADWR 55-WELL REGISTRY FOR WELLS IN PVRP STUDY AREA

APPENDIX D ADWR 55-WELL REGISTRY FOR WELLS WITHIN STUDY AREA

LOCATION	REGISTRY_ID	INSTALLED	WELL_DEPTH	CSG_DEPTH	DIAMETER	WATER_LEVEL	PUMPRATE	WELL_TYPE	DRILL_LOG	UTM_E	UTM_N	OWNER
D06008001BCA	606778	1/1/1964	1752	1752	16	337	2200	NON-EXEMPT		455384.00	3644505.00	CHARLES L. & PENNY LYNN CARDINAL, TRS
D06008001BCA	606777	1/1/1946	602	602	20	210	1200	NON-EXEMPT		455384.00	3644505.00	CHARLES L. & PENNY LYNN CARDINAL, TRS
D06008001DCC	605561	6/1/1964	401	341	10	215	15	EXEMPT		455983.60	3643005.00	HOLLAND,H
D06008002AAA	610583	1/1/1963	1440	1297	13	153	1950	NON-EXEMPT	X	454982.10	3645107.00	MESA, CITY OF,
D06008002AAC	610585	1/1/1950	490	490	20	350	800	NON-EXEMPT		454779.70	3644808.00	MESA, CITY OF,
D06008002ADD	610584	1/1/1952	402	400	20	350	450	NON-EXEMPT		454980.50	3644208.00	PEN, JOHN & LOIS,
D06008002ADD	533191	10/22/1991	230	0	0	0	0	OTHER	X	454980.50	3644208.00	SW GAS CORP,
D06008002BDD	617563		0	0	0	0	0	NON-EXEMPT		454170.80	3644211.00	MESA, CITY OF,
D06008002BDD	617563		0	0	0	0	0	NON-EXEMPT		454170.80	3844211.00	MESA, CITY OF,
D06008002CAC	617564		0	0	0	0	0	NON-EXEMPT		453965.20	3643614.00	MESA, CITY OF,
D06008002CDD	617775		0	0	0	0	0	EXEMPT		454185.50	3643014.00	MCFARLAND,B C
D06008002DAD	617565		0	0	0	0	0	NON-EXEMPT		454979.40	3643609.00	MESA, CITY OF,
D06008002DDA	617777		0	0	0	0	0	NON-EXEMPT		454978.90	3643309.00	MESA, CITY OF,
D06008002DDD	617776		0	0	0	0	0	NON-EXEMPT		454978.30	3643010.00	MESA, CITY OF,
D06008003000	907688	8/29/2007	60	60	8	59		OTHER	X	452659.00	3644064.00	EL PASO NATURAL GAS, ATTN: WILLIAM BALTZ
D06008003AAA	605240	1/1/1953	300	300	20	160	800	NON-EXEMPT		453367.80	3645110.00	MFC ARIZONA I LLC
D06008003ADA	605236	1/1/1947	300	300	20	160	700	NON-EXEMPT		453363.10	3644513.00	MFC ARIZONA I LLC
D06008003ADD	605241	1/1/1965	2305	2305	20	200	1000	NON-EXEMPT		453360.80	3644214.00	MFC ARIZONA I LLC
D06008003ADD	605241	1/1/1965	2305	2305	20	200	1000	NON-EXEMPT		453360.80	3644214.00	MFC ARIZONA I LLC
D06008003BAC	605349	1/1/1950	600	600	20	300	800	NON-EXEMPT		452362.50	3644808.00	BARTLETT FARMS INC,
D06008003BAD	605348	1/1/1960	2500	1800	20	300	1600	NON-EXEMPT		452563.10	3644808.00	BARTLETT FARMS INC,
D06008003BAD	605350	1/1/1940	200	200	20	300	0	NON-EXEMPT		452563.10	3644808.00	BARTLETT FARMS INC,
D06008003BBB	527351	5/6/1990	228	0	0	0	0	OTHER	X	451963.50	3645103.00	SOUTHWEST GAS CORP,
D06008003BBD	605351	1/1/1950	700	700	20	300	800	NON-EXEMPT		452161.80	3644807.00	BARTLETT FARMS INC,
D06008003BDD	605347	1/1/1946	500	500	20	300	800	NON-EXEMPT		452558.80	3644213.00	BARTLETT FARMS INC,
D06008003CBD	605352	1/1/1975	600	600	16	300	600	NON-EXEMPT		452153.70	3643618.00	BARTLETT FARMS INC,
D06008003CBD	605352	1/1/1975	600	600	16	300	600	NON-EXEMPT		452153.70	3643618.00	BARTLETT FARMS INC,
D06008003CCC	620627	1/1/1974	400	400	12	170	35	NON-EXEMPT		451949.30	3643024.00	HANNAH,E
D06008003CCC	620628	1/1/1950	230	230	6	170	20	EXEMPT		451949.30	3643024.00	HANNAH,E
D06008003CCD	605353	1/1/1935	500	500	20	300	600	NON-EXEMPT		452149.50	3643023.00	BARTLETT FARMS INC,
D06008003CDC	908684	4/1/2008	410	410	6	125	30	NON-EXEMPT	X	452349.80	3643022.00	EL PASO NATURAL GAS COMPANY
D06008003CDC	201338		250	80	6	0		OTHER	X	452349.80	3643022.00	SALT RIVER PROJECT
D06008003DAD	605237	1/1/1941	360	360	20	160	700	NON-EXEMPT		453356.30	3643616.00	A. WAYNE & HELEN L. FREEMAN
D06008003DCC	605238	1/1/1956	800	800	20	160	700	NON-EXEMPT		452750.50	3643021.00	A. WAYNE & HELEN L. FREEMAN
D06008003DCD	809361	4/1/1963	570	570	16	230		NON-EXEMPT	I	452950.80	3643020.00	KELLY FREEMAN
D06008003DDA	605239	1/1/1940	300	300	20	160	700	NON-EXEMPT		453354.00	3643317.00	A. WAYNE & HELEN L. FREEMAN
D06008003DDD	605242	1/1/1940	300	300	20	160	10	EXEMPT		453351.70	3643018.00	PETERSON,G E
D06008003DDD	805408	12/31/1955	350	240	20	0	35	EXEMPT		453351.70	3643018.00	N.S.K. & B. PRTSHP,
D06008010000	910661	4/23/2009	30		8	23		OTHER	X	452643.30	3642057.00	WESTERN EMULSIONS, INC.
D06008010ABB	525240		0	0	0	0	0	MONITOR		452748.80	3642771.00	SUNBELT REFINING CO,
D06008010ABC	524748	6/13/1989	35	0	10	0	0	MONITOR	X	452747.30	3642569.00	SUNBELT REFINING CO,
D06008010ACA	218940							NON-EXEMPT		452945.80	3642367.00	COOLIDGE POWER LLC
D06008010ACB	218941							NON-EXEMPT		452745.80	3642368.00	COOLIDGE POWER LLC
D06008010ADD	617778	5/31/2010	395	400	16	50	1180	NON-EXEMPT	X	453344.50	3642165.00	COOLIDGE POWER LLC
D06008010ADD	218257	5/4/2010	640	620	18	154		NON-EXEMPT	X	453344.50	3642165.00	COOLIDGE POWER LLC
D06008010ADD	218942							NON-EXEMPT		453344.50	3642165.00	COOLIDGE POWER LLC
D06008010ADD	218256	5/12/2009	620	658	18	154		NON-EXEMPT	X	453344.50	3642165.00	COOLIDGE POWER LLC
D06008010B00	910128							OTHER		452246.10	3642471.00	COOLIDGE POWER, LLC ATTN: JOHN CASSADY
D06008010BAB	524747	6/13/1989	36	7	6	30	0	MONITOR	X	452348.30	3642773.00	SUNBELT REFINING CO,
D06008010BAC	522760		0	0	0	0	0	NON-EXEMPT		452347.00	3642571.00	COOLIDGE LAND ACQUISITION COMPANY, LLC
D06008010BAC	524749	6/12/1989	30	7	6	20	0	MONITOR	X	452347.00	3642571.00	SUNBELT REFINING CO,

APPENDIX D ADWR 55-WELL REGISTRY FOR WELLS WITHIN STUDY AREA

LOCATION	REGISTRY_ID	INSTALLED	WELL_DEPTH	CSG_DEPTH	DIAMETER	WATER_LEVEL	PUMPRATE	WELL_TYPE	DRILL_LOG	UTM_E	UTM_N	OWNER
D06008010BAD	525241	8/7/1989	30	30	2	18	0	MONITOR	X	452547.10	3642570.00	SUNBELT REFINING CO,
D06008010BAD	522759	1/29/1989	493	493	12	180	137	NON-EXEMPT	X	452547.10	3642570.00	COOLIDGE LAND ACQUISITION COMPANY, LLC
D06008010BCB	624101	1/1/1945	600	600	20	250	600	NON-EXEMPT		451945.30	3642370.00	JOHN P/YVETTE K MCCLEVE
D06008010BCC	202727	3/25/2004	59	59	4	40		MONITOR	X	451944.10	3642169.00	ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
D06008010BCC	640485		0	0	0	0	0	EXEMPT		451944.10	3642169.00	MOORE,M
D06008010BDB	217827							OTHER		452345.50	3642369.00	COOLIDGE POWER CORPORATION
D06008010BDB	217828							MONITOR		452345.50	3642369.00	COOLIDGE POWER CORPORATION
D06008010CBC	536634	10/6/1992	230	0	0	50	0	OTHER	X	451941.70	3641765.00	SW GAS CORP,
D06008010CCC	617779		0	0	0	0	0	NON-EXEMPT		452738.00	3641361.00	MESA, CITY OF,
D06008010DDA	617774		0	0	0	0	0	EXEMPT		453339.30	3641561.00	MCFARLAND,B C
D06008010DDC	617780		610	176	16	176	0	NON-EXEMPT	X	453137.50	3641360.00	MESA, CITY OF,
D06008011AAA	805285	12/31/1929	0	0	0	10	0	EXEMPT		454976.20	3642759.00	MCFARLAND, BONNYE,C
D06008011ADA	617559		0	0	0	0	0	NON-EXEMPT		454972.70	3642356.00	MESA, CITY OF,
D06008011ADA	617558		0	0	0	0	0	NON-EXEMPT		454972.70	3642356.00	MESA, CITY OF,
D06008011ADC	617560		0	0	0	0	0	NON-EXEMPT		454767.50	3642155.00	MESA, CITY OF,
D06008011BDA	617557		0	0	0	0	0	NON-EXEMPT		454158.70	3642361.00	MESA, CITY OF,
D06008011CCA	530066	11/30/1990	300	300	10	80	0	EXEMPT	X	453744.80	3641559.00	VAIL 160 LLC
D06008011DDA	617561		0	0	0	0	0	NON-EXEMPT		454965.70	3641549.00	MESA, CITY OF,
D06008011DDD	617562		0	0	0	0	0	NON-EXEMPT		454964.00	3641347.00	MESA, CITY OF,
D06008011DDD	523310		0	0	0	0	0	EXEMPT		454964.00	3641347.00	CONNOLLY INVEST CORP,
D06008011DDD	518655		0	0	0	0	0	EXEMPT		454964.00	3641347.00	CONNOLLY INVEST CORP,
D06008012AAA	634731		0	0	0	0	0	EXEMPT		456586.40	3642752.00	VALLEY NATIONAL BANK,
D06008013AAA	609758	12/1/1962	1200	1200	20	0	1000	NON-EXEMPT		456576.80	3641153.00	ALL STATE ASSOCIATES OF PINAL XI LLC
D06008013AAB	609762		141	0	6	0	20	EXEMPT		456375.00	3641152.00	GOREE,R L
D06008013AAD	609759	1/1/1945	500	450	20	0	600	NON-EXEMPT		456574.00	3640952.00	ALL STATE ASSOCIATES OF PINAL XI LLC
D06008014ADD	550668	9/17/1995	500	114	8	0	0	OTHER	X	454955.90	3640543.00	EL PASO NATURAL GAS,
D06008014CCC	625234	5/1/1953	450	450	20	300	600	NON-EXEMPT		453525.20	3639752.00	MESA, CITY OF,
D06008014DCA	507832	4/30/1984	440	260	6	160	15	EXEMPT	X	454543.20	3639944.00	COOPER, THEODORE,J
D06008014DCB	507871	4/27/1984	350	350	6	180	10	EXEMPT	X	454340.00	3639946.00	JEFFREY SCOTT MARTIN
D06008014DCD	504821	12/4/1983	360	360	6	150	20	EXEMPT	X	454541.20	3639743.00	COOPER,T J
D06008015CAA	202084							EXEMPT		452530.00	3640356.00	AARON ZOBRIST
D06008015CAB	203457							EXEMPT		452330.10	3640356.00	SUNCRAFT CONSTRUCTION LLC
D06008015CAC	596799	5/31/2003	355	355	7	104	20	EXEMPT	X	452328.30	3640155.00	STEVE & KATHY BOWERS
D06008015CAD	203740							EXEMPT		452528.10	3640155.00	SUNCRAFT CONSTRUCTION LLC
D06008015CCC	909949	10/26/2008	390	390	6	132	20	EXEMPT	X	451924.90	3639754.00	SCOTT E. & CINDY L. CASLER
D06008015CCD	618029	11/20/1976	520	520	20	320	500	NON-EXEMPT		452124.80	3639753.00	PROLER INTERNTL CORP,
D06008015CDD	596744	3/10/2003	385	385	7	105		EXEMPT	X	452524.50	3639753.00	JOHN & ROSE LAKAMANA
D06008015CDD	915090	12/13/2013	408	408	5	95	20	EXEMPT	X	452524.50	3639753.00	DUSTIN HINTZ
D06008015DCC	625235	1/1/1940	400	400	12	250	500	NON-EXEMPT		452724.40	3639753.00	MESA, CITY OF,
D06008022000	638418	2/11/1947	400	400	8	220	35	EXEMPT		452617.70	3638847.00	DICKERSON,M
D06008022ACD	625237	1/1/1952	600	600	16	350	600	NON-EXEMPT		452918.70	3638948.00	MESA, CITY OF,
D06008022ADC	625238	1/1/1950	600	600	16	350	500	NON-EXEMPT		453118.90	3638947.00	MESA, CITY OF,
D06008022ADD	625239	3/1/1945	500	500	16	350	500	NON-EXEMPT		453318.90	3638947.00	MESA, CITY OF,
D06008022BDD	625236	1/1/1945	500	500	16	300	200	NON-EXEMPT		452518.30	3638949.00	MESA, CITY OF,
D06008022CBC	605845	1/1/1936	535	535	16	110	600	NON-EXEMPT		451914.00	3638548.00	CONSOLIDATED,
D06008022CBC	605846	1/1/1936	535	535	16	110	0	NON-EXEMPT		451914.00	3638548.00	CONSOLIDATED,
D06008022CCC	638433	1/1/1950	430	400	6	0	35	EXEMPT		451910.40	3638146.00	WINGLER,T W
D06008022CCC	625245	1/1/1965	500	500	12	200	30	EXEMPT		451910.40	3638146.00	WUERTZ,W
D06008022CCC	625244	1/1/1950	400	0	64	200	20	EXEMPT		451910.40	3638146.00	WUERTZ,W
D06008022CDC	625240	1/1/1940	300	300	16	250	900	NON-EXEMPT		452311.90	3638144.00	MESA, CITY OF,
D06008023AAA	622458	1/1/1958	600	600	20	250	300	NON-EXEMPT		454946.00	3639539.00	MESA, CITY OF,

APPENDIX D ADWR 55-WELL REGISTRY FOR WELLS WITHIN STUDY AREA

LOCATION	REGISTRY_ID	INSTALLED	WELL_DEPTH	CSG_DEPTH	DIAMETER	WATER_LEVEL	PUMPRATE	WELL_TYPE	DRILL_LOG	UTM_E	UTM_N	OWNER
D06008023BDD	622457	1/1/1945	1000	1000	20	250	600	NON-EXEMPT		454129.10	3638941.00	MESA, CITY OF,
D06008023DAA	625241	1/1/1959	500	500	16	350	900	NON-EXEMPT		454939.60	3638734.00	MESA, CITY OF,
D06008023DDC	625242	1/1/1950	500	500	12	350	500	NON-EXEMPT		454731.80	3638132.00	MESA, CITY OF,
D06008024ADD	622463		0	0	20	250	20	EXEMPT		456550.40	3638938.00	BROWN LAND CATTLE CO.
D06008024ADD	625243	1/1/1962	1900	1900	20	350	1500	NON-EXEMPT		456550.40	3638938.00	MESA, CITY OF,
D06008024BDD	622460	1/1/1949	800	800	20	300	500	NON-EXEMPT		455746.40	3638936.00	MESA, CITY OF,
D06008024BDD	807475	3/1/1997	300	300	20	0	0	NON-EXEMPT		455746.40	3638936.00	MESA, CITY OF,
D06008024DCA	526158	2/28/1989	500	500	6	150	25	EXEMPT	X	456143.20	3638335.00	BREBETON, MARGARET,
D06008025AAA	625222	1/1/1946	600	600	20	380	900	NON-EXEMPT		456542.30	3637935.00	INLAND FARMS INC,
D06008025ABB	625225	1/1/1960	500	500	20	380	500	NON-EXEMPT		455939.60	3637933.00	INLAND FARMS INC,
D06008025ADD	625223	1/1/1940	1600	1600	16	380	900	NON-EXEMPT		456540.50	3637333.00	INLAND FARMS INC,
D06008025DDC	625224	1/1/1960	600	600	16	400	1000	NON-EXEMPT		456337.10	3636532.00	INLAND FARMS INC,
D06008026AAC	212344							EXEMPT		454731.10	3637733.00	GREG A CLARK
D06008026ABA	904706		400	400	6	130	18	EXEMPT	X	454528.60	3637933.00	CEDAR CREEK/KAY DAVIS
D06008026BAD	622461	1/1/1953	800	800	16	300	200	NON-EXEMPT		454122.90	3637737.00	PAUL E. & LAURA SHEPLEY
D06008027ABA	512225	6/28/1986	650	650	12	230	300	NON-EXEMPT	X	452911.90	3637942.00	GOLDMAN DAIRY INC,
D06008027ABD	508445		0	0	0	0	0	NON-EXEMPT		452911.50	3637742.00	GOLDMAN LAND CO,
D06008027ACC	620635		400	400	20	325	600	NON-EXEMPT		452709.70	3637343.00	GOLDMAN DAIRY INC,
D06008027BAD	625233	9/1/1995	380	380	20	80	600	NON-EXEMPT		452510.00	3637743.00	MESA, CITY OF,
D06008027BBD	640760	1/1/1950	306	306	0	0	34	EXEMPT		452008.50	3637844.00	SNELSON,V
D06008027BCC	625229	1/1/1940	500	500	16	350	600	NON-EXEMPT		451905.50	3637342.00	MESA, CITY OF,
D06008027BDD	625232	1/1/1960	500	500	16	300	600	NON-EXEMPT		452508.70	3637343.00	MESA, CITY OF,
D06008027CCB	625230	1/1/1975	500	500	16	350	600	NON-EXEMPT		451902.50	3636740.00	SHEPLEY, LAURA E TR ETAL
D06008027CCC	550463	8/31/1995	300	0	4	120	18	EXEMPT	X	451901.70	3636538.00	BARGER, MARY,
D06008027CDD	625231	8/19/2001	414	414	12	107	700	NON-EXEMPT	X	452506.50	3636538.00	MESA, CITY OF,
D06008027DDD	620634		400	400	20	325	1200	NON-EXEMPT		453311.60	3636549.00	OCHOA BROTHERS,
D06008034ACC	611559	1/1/1940	500	500	20	250	800	NON-EXEMPT		452700.60	3635740.00	MESA, CITY OF,
D06008034CCC	624100	1/1/1962	800	800	20	300	800	NON-EXEMPT		451891.00	3634927.00	SELMA AND 87 FARMS, L.L.C.
D06008034CDD	624099	1/1/1946	800	800	20	300	1000	NON-EXEMPT		452493.30	3634927.00	HWY 287 FLORENCE BLVD INC
D06008034DDD	620632		400	400	20	325	800	NON-EXEMPT		453296.90	3634940.00	MESA, CITY OF,
D06008034DDD	620631		200	200	20	300	600	NON-EXEMPT		453296.90	3634940.00	MESA, CITY OF,
D06008035CCD	620633		400	400	20	325	1000	NON-EXEMPT		453699.90	3634940.00	MESA, CITY OF,
D06009004AAD	620900	1/1/1942	545	435	16	300	1000	NON-EXEMPT		461226.70	3644874.00	ARIZONA WATER COMPANY
D06009004AAB	620899	1/1/1942	475	410	16	289	333	NON-EXEMPT	X	461126.80	3645023.00	ARIZONA WATER COMPANY
D06009005ABA	220183							OTHER		459913.40	3645048.00	SOUTHWEST GAS CORPORATION
D06009006AAA	604213	1/1/1946	1000	1000	20	240	2200	NON-EXEMPT		458107.20	3645067.00	ARLENE F NEELY INVESTMENTS LP
D06009006AAA	222563							NON-EXEMPT		458107.20	3645067.00	ARLENE F NEELY INVESTMENTS LP
D06009006ACB	621903	10/27/1961	982	982	16	225	1300	NON-EXEMPT		457541.20	3644482.00	SAN CARLOS IRRIG,
D06009006DDC	621909	9/25/1959	1020	1020	20	211	1200	NON-EXEMPT		457913.70	3642993.00	SAN CARLOS IRRIG,
D06009007DDD	638443	1/1/1946	200	200	4	120	22	EXEMPT		457440.10	3642045.00	MITCHELL,H A
D06009007DDD	639047		0	0	0	0	0	EXEMPT		457440.10	3642045.00	LEWIS,L C
D06009007BDD	634025		0	0	6	120	27	EXEMPT		457063.20	3642449.00	MITCHELLET AL,R
D06009007BAA	219509		305	305	7	50	25	EXEMPT	X	457347.10	3642748.00	ANDERSON IRIE TR AGREEMENT
D06009007BBA	594042	10/7/2003	300	300	6	85	0	EXEMPT	X	456969.90	3642750.00	JOHNNY C SKILES SR
D06009007BBB	525629	10/20/1989	228	0	0	0	0	OTHER	X	456781.30	3642751.00	SOUTHWEST GAS CORP.
D06009007BBB	639685	1/1/1940	200	200	6	125	25	EXEMPT		456781.30	3642751.00	HARRIS,I C
D06009007BBC	610635	1/1/1960	350	350	6	0	30	EXEMPT		456780.30	3642552.00	ROTZ,J L
D06009007BCB	581230	8/6/2000	500	500	5	300		EXEMPT	X	456779.40	3642352.00	RODRIGO J CANTU
D06009007BCB	220207	11/10/2010	370	370	6	196	25	EXEMPT	X	456779.40	3642352.00	HARRIS BURTON
D06009007BCB	597046							EXEMPT		456779.40	3642352.00	RODRIGO J CANTU
D06009007BCC	522489		0	0	0	0	0	EXEMPT		456778.40	3642152.00	CARTER, TONY & BETTY,

APPENDIX D ADWR 55-WELL REGISTRY FOR WELLS WITHIN STUDY AREA

LOCATION	REGISTRY_ID	INSTALLED	WELL_DEPTH	CSG_DEPTH	DIAMETER	WATER_LEVEL	PUMPRATE	WELL_TYPE	DRILL_LOG	UTM_E	UTM_N	OWNER
D06009007BCC	514011		0	0	0	0	0	EXEMPT		456778.40	3642152.00	CARTER, TONY,L
D06009007CAA	605556	2/5/1958	1077	1077	20	228	2500	NON-EXEMPT		457344.70	3641946.00	THE SHELHOW LIMITED PARTNERSHIP
D06009007CAA	221958	8/30/2013	1200	1200	16	218	2500	NON-EXEMPT	X	457344.70	3641946.00	SHELHOW LIMITED PARTNERSHIP, LLP
D06009007CAA	503714		0	0	0	310	1800	NON-EXEMPT	X	457344.70	3641946.00	THE SHELTHOW LIMITED PARTNERSHIP, LLP
D06009007CBB	638440	1/1/1968	220	220	6	118	25	EXEMPT		456777.50	3641952.00	CARTER,C
D06009007CBC	220756	7/17/2012	405	405	5		13	EXEMPT	X	456776.50	3641753.00	FRED PEREA
D06009007CDD	605559	5/1/1972	1600	1600	20	274	2000	NON-EXEMPT		457343.00	3641345.00	THE SHELHOW LIMITED PARTNERSHIP
D06009007CDD	605557	1/1/1946	500	500	20	196	800	NON-EXEMPT		457343.00	3641345.00	THE SHELHOW LIMITED PARTNERSHIP
D060090188AC	622456	1/1/1979	1420	1420	20	250	1800	NON-EXEMPT		457148.40	3640945.00	MESA, CITY OF,
D060090188DC	622462	1/1/1958	1500	1500	20	250	1800	NON-EXEMPT		457143.20	3640943.00	MESA, CITY OF,
D060090198BD	622459	1/1/1954	800	800	20	300	200	NON-EXEMPT		456938.30	3639337.00	MESA, CITY OF,
D06009021A00	515452	8/18/1986	300	20	8	0	0	OTHER	X	460985.60	3639192.00	ALL AM. PIPELINE,
D060090228BB	546748	5/26/1995	400	0	0	0	0	OTHER	X	461492.10	3639489.00	ALL AMERICAN PIPELNE,
D060090333ACB	638400		1200	1200	20	0	4	EXEMPT		460662.50	3635872.00	SHEPLEY RANCH LLC
D060090338AD	615435	1/1/1948	1200	1090	20	0	500	NON-EXEMPT		460462.40	3636076.00	AZ STATE LAND DEPT,

Appendix E

ADWR 35-WELL REGISTRY FOR WELLS IN PVRP STUDY AREA

APPENDIX E. ADWR 35-WELL REGISTRY FOR WELLS IN PVRP STUDY AREA

WELL35_ID	REGNO_35	CADASTRAL	OWNER	WATER_USE	WELL_USE	LOG_DATA	WELL DEPTH	COMPLETED	WELL TEST	WELL YIELD	HORSE POWER	DTW	YIELD METHOD	DRAW-DOWN	UTM_E	UTM_N
20183		D-06008001BBB	x	OTHER-EXPLOR	ABANDONED	DRILLERS LOG	300	1/1/1946		0	0	108	x	0	455246.3	3644908.0
20184		D-06008001BBB	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1754	5/21/1964		2400	0	260	x	100	455246.3	3644908.0
20185		D-06008002AAA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1500	1/1/1963		1950	0	0	5	0	455044.4	3644908.8
20186		D-06008002AAC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	490	2/7/1950		1800	220	115	x	30	454842.0	3644609.6
20187		D-06008002ADD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	402	2/10/1952		2100	125	130	5	30	455042.8	3644009.8
20188	XX076	D-06008002BAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	350	1/1/1940	7/15/1976	2800	125	100	4	100	454235.7	3644611.3
20189		D-06008002BDA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	365	1/27/1947	11/8/1947	2500	100	66	9	0	454234.4	3644312.1
20190		D-06008002BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	x	250	1/1/1929		1430	0	0	9	0	454233.1	3644012.8
20191	23952	D-06008002CCC	x	STOCK	WATER PRODUCTION	DRILLERS LOG	384	5/25/1973		0	0	298	x	0	453616.8	3642818.9
20192		D-06008002DAD	PRIVATE	IRRIGATION	WATER PRODUCTION	x	300			1710	0	0	9	0	455041.7	3643410.5
20193		D-06008002DAD	x	x	WATER PRODUCTION	DRILLERS LOG	700	10/23/1948		0	0	96	x	0	455041.7	3643410.5
20194		D-06008002DD0	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	1/1/1935		970	0	50	5	70	454939.3	3642961.5
20195		D-06008002DDA	PRIVATE	IRRIGATION	WATER PRODUCTION	x	250	1/1/1929		0	0	0	x	0	455041.2	3643110.9
20196		D-06008002DDA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	700			0	0	108	x	0	455041.2	3643110.9
20197		D-06008003AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	400	2/23/1940		2500	165	60	x	160	453430.1	3644911.9
20198		D-06008003AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG, LITH LOG	2305	4/10/1964		0	0	200	x	0	453430.1	3644911.9
20199		D-06008003AAA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	352	7/18/1951		1750	125	0	0	200	453430.1	3644911.9
20200		D-06008003ADD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	388	1/12/1949		2000	180	87	x	160	453423.2	3644015.4
20201		D-06008003BBB	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	700	9/1/1957	10/5/1957	1300	0	110	4	110	452025.8	3644905.0
20202		D-06008003BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	0			0	0	0	x	0	452621.1	3644014.5
20203		D-06008003BDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1750	1/1/1956		1600	0	110	x	150	452621.1	3644014.5
20204		D-06008003BDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	625	1/1/1961		600	0	0	4	300	452621.1	3644014.5
20205		D-06008003CAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	388			3820	0	0	9	0	452618.9	3643716.7
20206		D-06008003CCD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	516	3/13/1950		0	75	82	x	0	452211.8	3642824.8
20207		D-06008003DAA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	380	11/18/1950		700	0	85	x	265	453420.8	3643716.5
20208		D-06008003DCD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	570	1/1/1963	6/1/1963	350	75	0	0	120	453013.2	3642821.6
20209		D-06008003DDA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	474	4/1/1948		1500	100	82	x	150	453416.3	3643118.9
20210		D-06008003DDD	PRIVATE	IRRIGATION	WATER PRODUCTION	x	310	1/1/1918		650	0	100	9	153	453414.0	3642820.0
20265		D-06008010ADD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	806	8/6/1956		0	0	126	x	0	453406.8	3641966.4
20266		D-06008010BCD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	2/1/1947	2/7/1955	1000	75	73	0	0	452206.4	3641969.6
20267		D-06008010DCC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1330	4/22/1961		0	0	200	x	0	452800.3	3641162.3
20268		D-06008010DDA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	450	1/1/1940		3000	200	90	9	55	453401.6	3641362.8
20269		D-06008010DDC	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	800	6/9/1954		1800	0	0	x	90	453199.8	3641161.7
20270		D-06008011ADA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	365	6/15/1951	8/15/1954	450	13	100	x	0	455035.0	3642157.2
20271		D-06008011ADC	PRIVATE	IRRIGATION	WATER PRODUCTION	MISCELLANEOUS	1216	5/4/1959		0	0	165	x	0	454829.8	3641956.9
20272		D-06008011ADD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	365	1/1/1951		0	0	100	x	0	455033.3	3641955.4
20273		D-06008011BDA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	600	3/14/1961		0	0	200	x	0	454221.0	3642162.5
20274		D-06008011DDA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	1/1/1951		0	0	70	x	0	455028.0	3641350.3
20275		D-06008011DDA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	7/1/1950	2/1/1963	850	75	80	0	250	455028.0	3641350.3
20276		D-06008013AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1200	11/24/1962	12/21/1962	1700	150	0	5	99	456639.1	3640954.9
20277		D-06008013AAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	3/1/1951	9/24/1952	1200	110	80	x	220	456636.3	3640753.3
20278		D-06008013CDA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	7/1/1951		350	110	86	0	130	455817.5	3639743.0

APPENDIX E. ADWR 35-WELL REGISTRY FOR WELLS IN PVRP STUDY AREA

WELL35_ID	REGNO_35	CADASTRAL	OWNER	WATER_USE	WELL_USE	LOG_DATA	WELL DEPTH	COMPLETED	WELL TEST	WELL YIELD	HORSE POWER	DTW	YIELD METHOD	DRAW-DOWN	UTM_E	UTM_N
20279		D-06008014CCC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	450	5/1/1953		0	0	55	x	0	453587.5	3639553.6
20280		D-06008014CDA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	200	2/1/1950		0	0	62	x	0	454199.0	3639749.2
20281		D-06008015CCC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	186	4/1/1944		1600	0	63	x	0	451987.2	3639555.2
20282		D-06008015DCC	PRIVATE	IRRIGATION	WATER PRODUCTION	x	186	1/1/1944		0	0	0	x	0	452786.7	3639554.7
20331		D-06008022000	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	190	1/1/1943		800	0	91	x	12	452680.0	3638648.7
20332		D-06008022ADD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	200	1/1/1917		1200	0	49	x	0	453381.2	3638748.7
20333		D-06008022ADD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	400	12/10/1952	1/1/1952	700	75	95	5	250	453381.2	3638748.7
20334		D-06008022BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	200	1/1/1945		800	0	50	x	0	452580.6	3638750.2
20335		D-06008022CCB	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	227	5/1/1946		600	30	73	x	0	451974.5	3638148.2
20336		D-06008022CCB	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	501	1/1/1959		0	0	190	x	0	451974.5	3638148.2
20337		D-06008022DCC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	315	5/1/1951	7/1/1952	1600	100	90	5	25	452775.3	3637944.5
20338		D-06008023AAA	PRIVATE	x	x	DRILLERS LOG	320	1/1/1951		0	0	80	x	0	455008.3	3639340.2
20339		D-06008023AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	650	5/25/1958	3/1/1959	600	125	130	4	0	455008.3	3639340.2
20340		D-06008023ADD	PRIVATE	IRRIGATION	WATER PRODUCTION	x	0	1/1/1948		0	0	0	x	0	455003.5	3638736.6
20341		D-06008023BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	815	5/31/1955		0	0	95	x	0	454191.4	3638742.9
20342	26273	D-06008023DAA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	12/9/1973		0	0	215	x	0	455001.9	3638535.4
20343		D-06008023DAB	PRIVATE	IRRIGATION	WATER PRODUCTION	x	0			0	0	185	x	0	454798.8	3638536.9
20344		D-06008023DDC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	409	12/12/1950		0	0	60	x	0	454794.1	3637933.2
20345		D-06008024AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1850	1/1/1964		2000	0	212	0	180	456617.9	3639342.5
20346		D-06008024ADA	CORPORATION	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	1/1/1947		2000	0	0	5	0	456614.5	3638940.8
20347		D-06008024ADA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1850	1/1/1964	1/1/1969	2000	200	212	0	180	456614.5	3638940.8
20348		D-06008024BCD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	400	1/1/1930		3300	150	70	x	0	455406.6	3638736.6
20349		D-06008024BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	800	1/1/1956		1400	0	125	5	150	455808.7	3638737.8
20350		D-06008024BDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	2460	1/1/1964		0	0	120	x	0	455808.7	3638737.8
20351		D-06008024DAA	CORPORATION	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	300	4/1/1947		2000	0	0	5	0	456611.0	3638539.4
20352		D-06008025AAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	510	2/1/1948		1600	125	60	5	0	456604.6	3637736.7
20353		D-06008025ADA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	210			1800	0	43	x	0	456603.4	3637335.4
20354		D-06008025BAB	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	464	1/10/1968	5/28/1968	900	150	155	0	200	455600.1	3637732.9
20355		D-06008025D00	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	150	1/1/1928		0	0	40	x	0	456300.5	3636634.7
20356		D-06008025DAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	502	3/29/1956	1/1/1957	1100	150	120	0	140	456602.1	3636934.3
20357		D-06008025DAC	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	522	10/1/1958		0	0	60	x	0	456400.7	3636734.4
20358		D-06008026BAA	x	DOMESTIC	WATER PRODUCTION	DRILLERS LOG	500	7/28/1962		0	0	125	x	0	454185.4	3637737.4
20359		D-06008027ADD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	600	1/5/1964	2/1/1964	1000	125	136	5	80	453374.9	3637145.9
20360		D-06008027BAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	341	1/1/1957	1/1/1958	1000	125	0	4	50	452572.3	3637544.7
20361		D-06008027BCC	PRIVATE	IRRIGATION	WATER PRODUCTION	x	200	1/1/1943		900	0	85	9	20	451967.8	3637143.9
20362		D-06008027BCC	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	400	12/10/1951	11/15/1952	1000	50	130	5	0	451967.8	3637143.9
20363		D-06008027BDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	1/1/1945		900	0	0	x	50	452571.0	3637144.8
20364		D-06008027BDD	x	IRRIGATION	WATER PRODUCTION	x	554	4/14/1972	4/18/1972	500	100	211	0	100	452571.0	3637144.8
20365		D-06008027CBO	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	196	1/1/1952		400	0	90	5	110	452066.8	3636843.0
20366		D-06008027CCB	PRIVATE	IRRIGATION	WATER PRODUCTION	x	216	1/1/1920		800	0	56	x	0	451964.8	3636541.5
20367	33529	D-06008027CCC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	1/1/1975	1/13/1976	600	100	257	7	103	451964.0	3636339.8
20411		D-06008034ACC	PRIVATE	IRRIGATION	WATER PRODUCTION	x	500	1/1/1948		0	0	108	x	0	452762.9	3635541.9

APPENDIX E. ADWR 35-WELL REGISTRY FOR WELLS IN PVRP STUDY AREA

WELL35_ID	REGNO_35	CADASTRAL	OWNER	WATER_USE	WELL_USE	LOG_DATA	WELL DEPTH	COMPLETED	WELL TEST	WELL YIELD	HORSE POWER	DTW	YIELD METHOD	DRAW-DOWN	UTM_E	UTM_N
20412		D-06008034CDC	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	760	8/25/1962		0	0	0	x	0	452354.8	3634729.2
20413		D-06008034CDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	460	3/1/1946	9/1/1955	3000	200	118	5	70	452555.6	3634729.2
20414		D-06008034DDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	560	11/1/1947	1/1/1957	1600	200	126	4	97	453359.2	3634741.8
20415		D-06008035ABB	FEDERAL	OTHER-EXPLOR	DESTROYED	DRILLERS LOG	290	1/1/1934		0	0	61	x	0	454385.0	3636146.2
20416		D-06008036ADA	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	400	9/17/1951	1/1/1952	2000	100	110	0	100	456595.3	3635732.5
20417		D-06008036DDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	8/25/1951	8/1/1952	2000	100	110	0	100	456585.9	3634732.7
20418		D-06009004ADA	COUNTY	DOMESTIC	WATER PRODUCTION	DRILLERS LOG	600	1/1/1943		700	0	199	x	25	461387.4	3644233.6
20419		D-06009004ADD	COUNTY	x	x	DRILLERS LOG	556	1/1/1943		600	0	199	x	24	461385.9	3643939.8
20420		D-06009006AAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	608	1/1/1940		1800	0	128	x	32	458168.8	3644571.5
20421		D-06009006BDD	FEDERAL	OTHER-EXPLOR	ABANDONED	DRILLERS LOG	584	1/1/1947		0	0	148	x	0	457414.4	3643988.5
20422		D-06009006DAA	PRIVATE	IRRIGATION	WATER PRODUCTION	x	606	1/1/1940		1800	0	128	x	32	458166.5	3643682.7
20423		D-06009006DCA	FEDERAL	x	x	DRILLERS LOG	550	1/1/1947		0	0	75	x	0	457788.4	3643093.2
20424		D-06009006DCD	FEDERAL	IRRIGATION	WATER PRODUCTION	DRILLERS LOG, LITH LOG	1050	1/1/1959		2550	0	130	x	156	457787.6	3642796.3
20425		D-06009007BBC	PRIVATE	DOMESTIC	WATER PRODUCTION	x	249	1/1/1936		0	0	0	x	0	456842.6	3642353.3
20426	26954	D-06009007BBC	x	DOMESTIC	WATER PRODUCTION	DRILLERS LOG	370	1/1/1974		7	0	110	x	117	456842.6	3642353.3
20427		D-06009007CAA	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1077	1/1/1958		2200	0	100	0	60	457407.0	3641747.9
20428		D-06009007CB0	PRIVATE	DOMESTIC	WATER PRODUCTION	x	275	1/1/1940		0	0	66	x	0	456933.9	3641653.0
20429		D-06009007CDC	PRIVATE	IRRIGATION	WATER PRODUCTION	x	500	1/1/1947		0	0	112	x	0	457216.0	3641149.3
20430		D-06009007CDD	PRIVATE	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1600	1/1/1972		0	0	305	x	0	457405.3	3641146.6
20431		D-06009007CDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	1/1/1946		800	0	250	x	150	457405.3	3641146.6
20432	72646	D-06009018BAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1440	1/1/1979		0	0	350	x	0	457400.1	3640744.5
20433		D-06009018BDA	CORPORATION	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1402	1/1/1959		0	0	150	x	0	457397.5	3640543.3
20434		D-06009018BDD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	530	1/1/1947		2900	0	100	5	0	457394.9	3640342.2
20435		D-06009019BBD	PRIVATE	IRRIGATION	WATER PRODUCTION	x	500	1/1/1947		0	0	102	x	0	457000.6	3639138.3
20436	75019	D-06009019BBD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	500	1/1/1947		0	0	102	x	0	457000.6	3639138.3
20437		D-06009030AAC	x	x	WATER PRODUCTION	DRILLERS LOG	1165	1/1/1972		0	0	0	x	0	457927.5	3637507.2
20438		D-06009030CCC	FEDERAL	IRRIGATION	WATER PRODUCTION	DRILLERS LOG, LITH LOG	1165	1/1/1972		3000	0	215	x	0	456794.7	3636330.6
20439		D-06009030CDC	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	390	1/1/1951		0	0	85	x	0	457171.6	3636324.6
20440		D-06009033BAD	x	IRRIGATION	WATER PRODUCTION	DRILLERS LOG	1200	1/1/1948		500	0	0	0	150	460524.6	3635877.3

Appendix F

ADWR GWSI FOR WELLS IN PVRP STUDY AREA

APPENDIX F. ADWR GWSI FOR WELLS IN PVRP STUDY AREA

Site ID	Local ID	Reg. ID	DTW (ft)	WL Elev (ft amsl)	WL Date	Data Type	Well Depth (ft)	Case Dia (in)	Water Use	Drill Date	Lat NAD27	Lon NAD27
325458111295101	D-06-08 10ADD	617778	59	1391	11/4/1998	STANDARD	806	20.00	IRRIGATION	8/6/1956	32.92	111.50
325458111304001	D-06-08 10BCA		54	1384	12/18/2013	STANDARD	500	16.00	UNUSED	2/1/1947	32.92	111.51
325429111301901	D-06-08 10DCC	617779	89	1358	12/18/2013	STANDARD	1330	20.00	UNUSED	4/22/1961	32.91	111.51
325440111295301	D-06-08 10DDA	617774	75	1375	1/10/1994	STANDARD	450	20.00	DOMESTIC	1/1/1940	32.91	111.50
325431111300101	D-06-08 10DDC	617780	68	1380	12/3/2003	STANDARD	800	20.00	UNUSED	6/9/1954	32.91	111.50
325507111291801	D-06-08 11ACB	617557	92	1368	11/4/1998	STANDARD	600	20.00	IRRIGATION	3/14/1961	32.92	111.49
325503111284801	D-06-08 11ADA1	617559	62	1411	12/3/2013	INDEX	365	18.00	UNUSED	6/15/1951	32.92	111.48
325503111285001	D-06-08 11ADA2	617558				STANDARD			IRRIGATION		32.92	111.48
325500111285901	D-06-08 11ADC	617560				STANDARD	1216	20.00	IRRIGATION	5/4/1959	32.92	111.48
325440111284901	D-06-08 11DDA	617561				STANDARD	500	12.00	UNUSED	7/1/1950	32.91	111.48
325439111284901	D-06-08 11DDD	617562	234	1239	12/4/2013	STANDARD	300	12.00	IRRIGATION	1/1/1951	32.91	111.48
325429111274601	D-06-08 13AAA	609758				STANDARD	1200	20.00	IRRIGATION	11/24/1962	32.91	111.46
325419111274801	D-06-08 13AAD	609759	78	1426	12/4/2013	STANDARD	300	16.00	UNUSED	3/1/1951	32.91	111.46
325348111282101	D-06-08 13CDA		108	1379	1/18/1955	STANDARD	300		UNUSED	7/1/1951	32.90	111.47
325342111294701	D-06-08 14CCC	625234	115	1341	12/3/2013	INDEX	450	20.00	IRRIGATION	5/1/1953	32.89	111.50
325348111292401	D-06-08 14CDA		109	1353	1/13/1958	STANDARD	225		UNUSED	2/1/1950	32.90	111.49
325342111290401	D-06-08 14DCD1	504821	104	1364	11/12/1993	STANDARD	360	6.00	DOMESTIC		32.90	111.48
325336111303901	D-06-08 15CCD	618029				STANDARD	520		IRRIGATION		32.89	111.51
325339111302001	D-06-08 15DCC	625235	90	1363	11/8/1988	STANDARD	186	20.00	UNUSED	4/1/1944	32.89	111.51
325311111300801	D-06-08 22ACD	625237	70	1387	12/18/2013	STANDARD	600		UNUSED		32.89	111.50
325311111300401	D-06-08 22ADC	625238	59	1398	12/18/2007	STANDARD	600		UNUSED		32.89	111.50
325313111295801	D-06-08 22ADD1		49	1411	1/1/1936	STANDARD	195	16.00	UNUSED	1/1/1917	32.89	111.50
325313111295101	D-06-08 22ADD2	625239	111	1348	1/10/1994	STANDARD	400	20.00	UNUSED	12/10/1952	32.89	111.50
325317111302801	D-06-08 22BDD	625236	62	1396	11/20/2003	STANDARD	200	16.00	DOMESTIC	1/1/1945	32.89	111.51
325256111304801	D-06-08 22CCB1	605845	82	1381	12/6/2007	STANDARD	227	12.00	UNUSED	5/1/1946	32.88	111.51
325256111304901	D-06-08 22CCB2	605846	109	1355	11/12/1993	STANDARD	501	16.00	IRRIGATION	4/5/1959	32.88	111.51
325249111300201	D-06-08 22DCC	625240	105	1362	11/8/1984	STANDARD	315	16.00	IRRIGATION	5/1/1951	32.88	111.50
325336111284801	D-06-08 23AAA1		80	1394	9/12/1951	STANDARD	320	20.00	IRRIGATION	1/30/1951	32.89	111.48
325336111284901	D-06-08 23AAA2	622458	48	1426	12/16/2013	STANDARD	650	20.00	UNUSED	5/25/1958	32.89	111.48
325315111291501	D-06-08 23ADD					STANDARD		20.00	UNUSED	4/1/1948	32.89	111.49
325317111292101	D-06-08 23BDD	622457				STANDARD	815	20.00	IRRIGATION	5/31/1955	32.89	111.49
325311111285601	D-06-08 23DAB	625241	181	1291	11/14/1984	STANDARD	500	20.00	IRRIGATION	1/1/1967	32.89	111.48

APPENDIX F. ADWR GWSI FOR WELLS IN PVRP STUDY AREA

325247111285501	D-06-08 23DDD	625242	60	1413	8/17/1950	STANDARD	409	20.00	IRRIGATION	12/12/1950	32.88	111.48
325324111274701	D-06-08 24ADA	625243	89	1418	12/4/2013	STANDARD	1850	20.00	UNUSED	1/1/1964	32.89	111.46
325312111274601	D-06-08 24ADD	622463				STANDARD			DOMESTIC		32.89	111.46
325316111281701	D-06-08 24BDD1	807475	50	1440	3/10/1942	STANDARD	300	20.00	UNUSED	1/1/1941	32.89	111.47
325315111281701	D-06-08 24BDD2	622460	125	1365	2/17/1946	STANDARD	800	20.00	UNUSED	2/17/1956	32.89	111.47
325315111281801	D-06-08 24BDD3		122	1368	1/10/1994	STANDARD	2460	14.00	IRRIGATION	4/10/1964	32.89	111.47
325311111283801	D-06-08 24CBA		111	1367	11/14/1984	STANDARD	400	20.00	UNUSED	1/1/1930	32.89	111.48
325243111275101	D-06-08 25AAA	625222	122	1383	1/2/2014	STANDARD	510	20.00	IRRIGATION	2/1/1948	32.88	111.46
325245111281601	D-06-08 25ABB	625225	194	1301	1/17/1977	STANDARD	464	20.00	IRRIGATION	1/10/1968	32.88	111.47
325030111275701	D-06-08 25ADA	625223	119	1382	12/4/2013	STANDARD	210	20.00	IRRIGATION		32.87	111.46
325218111274701	D-06-08 25DAA		120	1383	3/29/1956	STANDARD	502	20.00	IRRIGATION	3/29/1956	32.87	111.46
325208111275801	D-06-08 25DAC	625224	124	1381	11/12/1998	STANDARD	522	20.00	IRRIGATION	10/1/1958	32.87	111.47
325204111275001	D-06-08 25DDA		100	1402	1/15/1957	STANDARD	150		IRRIGATION	1/1/1928	32.87	111.46
325238111292601	D-06-08 26BAD	622461	116	1351	12/16/2013	STANDARD	800		IRRIGATION		32.88	111.49
325221111295201	D-06-08 27ADC	620635				STANDARD	600	20.00	IRRIGATION	1/5/1964	32.87	111.50
325220111305001	D-06-08 27BCC1		70	1402	5/8/1944	STANDARD	212	12.00	IRRIGATION	1/1/1943	32.87	111.51
325221111304801	D-06-08 27BCC2		130	1342	12/1/1951	STANDARD	400	16.00	UNDETERMINED	1/1/1951	32.87	111.51
325218111305001	D-06-08 27BCC3		104	1368	11/1/1993	STANDARD		15.00	UNUSED		32.87	111.51
325232111302301	D-06-08 27BDA	625233	69	1396	12/7/2000	STANDARD		20.00	UNUSED		32.88	111.51
325226111305001	D-06-08 27BDD1		150	1322	1/13/1958	STANDARD	300	12.00	UNUSED	8/1/1943	32.87	111.51
325220111302201	D-06-08 27BDD2	625232	120	1350	11/14/2012	INDEX	554	16.00	IRRIGATION	4/14/1972	32.87	111.51
325203111304801	D-06-08 27CCB1		97	1378	2/3/1948	STANDARD	216	24.00	UNUSED	1/1/1920	32.87	111.51
325202111304901	D-06-08 27CCB2	625230	150	1325	7/24/1997	STANDARD	500		IRRIGATION		32.87	111.51
325156111302201	D-06-08 27CDD	625231	94	1383	11/5/1998	STANDARD	516	20.00	IRRIGATION	4/7/1953	32.87	111.51
325155111295001	D-06-08 27DDD	620634	100	1376	11/11/1998	STANDARD	604	20.00	IRRIGATION	5/29/1951	32.87	111.50
325131111301901	D-06-08 34ACC	611559	88	1397	12/2/2013	STANDARD	500	20.00	UNUSED	1/1/1948	32.86	111.51
325103111303301	D-06-08 34CCD	624100				STANDARD	760	20.00	IRRIGATION	8/25/1962	32.85	111.51
325103111302501	D-06-08 34CDD	624099	143	1346	11/14/1984	STANDARD	460	20.00	IRRIGATION	3/1/1946	32.85	111.51
325103111295101	D-06-08 34DDD	620632	92	1398	12/11/2013	STANDARD	560	20.00	UNUSED	11/1/1947	32.85	111.50
325151111291601	D-06-08 35ABB		61	1423	12/7/1949	STANDARD	290	20.00	UNUSED	5/1/1934	32.86	111.49
325103111294901	D-06-08 35CCC		205	1284	11/20/1984	STANDARD			IRRIGATION		32.85	111.50
325102111293501	D-06-08 35CCD	620633	77	1412	11/9/1993	STANDARD		20.00	UNUSED		32.85	111.49
325138111275001	D-06-08 36ADA		110	1453	9/17/1951	STANDARD	400	20.00	IRRIGATION	9/17/1951	32.86	111.46

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325106111275001	D-06-08 36DDD		110	1390	8/25/1951	STANDARD	500	20.00	IRRIGATION	8/25/1951	32.85	111.46
325639111284801	D-06-08N02DAA	610583	172	1298	12/16/2013	STANDARD	1500	20.00	IRRIGATION	5/15/1963	32.94	111.48
325630111284901	D-06-08N02DAD					STANDARD	300		IRRIGATION		32.94	111.48
325605111285801	D-06-08N02DCA	610585	111	1355	12/16/2013	STANDARD	490	20.00	IRRIGATION	2/7/1950	32.94	111.48
325624111284701	D-06-08N02DDA	610584	120	1350	12/4/2013	STANDARD	402	20.00	IRRIGATION	2/10/1952	32.94	111.48
325641111295101	D-06-08N03DAA	605240	92	1351	12/3/2007	STANDARD	352	20.00	IRRIGATION	7/18/1951	32.94	111.50
325640111295001	D-06-08N03DDA	605241	65	1377	12/4/2013	STANDARD	2305	18.00	IRRIGATION	4/10/1964	32.94	111.50
325640111295101	D-06-08N03DDD	605241	88	1356	12/16/2013	STANDARD	400	20.00	IRRIGATION	2/23/1940	32.94	111.50
325614111282801	D-06-08S01BAB1	606777	125	1356	12/16/2013	STANDARD	300	20.00	IRRIGATION	10/31/1946	32.94	111.47
325613111283101	D-06-08S01BAB2	606778	234	1247	12/16/2013	STANDARD	1754	16.00	IRRIGATION	1/6/1964	32.94	111.47
325559111292301	D-06-08S02BDA	617563	92	1365	12/16/2013	STANDARD	365	20.00	IRRIGATION	1/27/1947	32.93	111.49
325550111292001	D-06-08S02BDD	617563	88	1369	11/2/1993	STANDARD	250	20.00	IRRIGATION	1/1/1929	32.93	111.49
325525111291901	D-06-08S02CDD	617775	65	1393	12/16/2013	STANDARD		20.00	UNUSED		32.92	111.49
325532111285201	D-06-08S02DAA	617565	258	1214	7/22/1997	STANDARD	250	20.00	IRRIGATION	1/1/1929	32.93	111.48
325531111285301	D-06-08S02DAD	617777	107	1366	11/8/2010	INDEX	700	20.00	IRRIGATION	10/23/1948	32.93	111.48
325526111284801	D-06-08S02DDD	617776	83	1391	12/16/2013	STANDARD			IRRIGATION		32.92	111.48
325547111295301	D-06-08S03ADD	605237	75	1369	12/16/2013	STANDARD	380	20.00	IRRIGATION	11/18/1950	32.93	111.50
325614111302101	D-06-08S03BAA	605347	107	1326	8/21/1996	STANDARD			IRRIGATION		32.94	111.51
325603111303601	D-06-08S03BBD	605352	63	1364	11/10/1998	STANDARD	700	20.00	IRRIGATION	9/1/1957	32.93	111.51
325548111303401	D-06-08S03BDC	605349	66	1364	11/10/1998	STANDARD			IRRIGATION		32.93	111.51
325550111302101	D-06-08S03BDD1		81	1352	11/7/1988	STANDARD	250	20.00	UNUSED	1/1/1940	32.93	111.51
325549111302101	D-06-08S03BDD2	605348	83	1351	12/5/2007	STANDARD	2500	20.00	UNUSED	2/23/1956	32.93	111.51
325547111302401	D-06-08S03CAA					STANDARD	388	20.00	UNUSED		32.93	111.51
325531111303601	D-06-08S03CCA	605352	82	1353	12/5/2007	STANDARD			IRRIGATION		32.93	111.51
325524111305601	D-06-08S03CCD		74	1361	12/19/2013	STANDARD	516	20.00	IRRIGATION	3/13/1950	32.92	111.51
325522111301501	D-06-08S03DCC	605238	88	1350	11/10/1993	STANDARD	800		IRRIGATION		32.92	111.50
325524111300701	D-06-08S03DCD		86	1354	12/5/2007	STANDARD	570		UNUSED		32.92	111.50
325532111295101	D-06-08S03DDA	605239	153	1292	9/24/1997	STANDARD	460	20.00	IRRIGATION	4/1/1948	32.93	111.50
325524111295201	D-06-08S03DDD	605242	145	1302	1/13/1977	STANDARD	310	20.00	DOMESTIC	1/1/1918	32.92	111.50
325513111274201	D-06-09 07BBC1					STANDARD	249	6.00	DOMESTIC	9/1/1936	32.92	111.46
325514111274101	D-06-09 07BBC2		110	1397	3/15/1975	STANDARD	370	6.00	DOMESTIC	10/15/1974	32.92	111.46
325454111265101	D-06-09 07CAA	605556	252	1266	1/2/2014	STANDARD	1077	20.00	IRRIGATION	2/5/1958	32.91	111.46
325451111273901	D-06-09 07CB UNSURV		66	1446	4/1/1940	STANDARD	275	6.00	DOMESTIC	1/1/1940	32.91	111.46

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325432111272701	D-06-09 07CDD1	605557	101	1419	11/3/1998	STANDARD	500	20.00	UNUSED	1/1/1946	32.91	111.46
325432111271801	D-06-09 07CDD2	605559	264	1256	12/4/2013	STANDARD	1600	20.00	IRRIGATION	5/24/1972	32.91	111.46
325427111262800	D-06-09 17BAB					STANDARD	1504	8.00	UNUSED	8/23/1978	32.91	111.44
325427111262801	D-06-09 17BAB PZ1		283	1262	2/21/1979	STANDARD	1029	1.25	UNUSED	8/23/1978	32.91	111.44
325427111262802	D-06-09 17BAB PZ2		205	1340	2/21/1979	STANDARD	468	1.25	UNUSED	8/23/1978	32.91	111.44
325418111272301	D-06-09 18BAD	622456	245	1275	11/2/1993	STANDARD	1440	20.00	IRRIGATION	9/10/1979	32.91	111.46
325416111271801	D-06-09 18BDC	622462	203	1314	11/2/1993	STANDARD	1402	20.00	IRRIGATION	9/1/1959	32.90	111.46
325328111273501	D-06-09 19BBD	622459	106	1411	11/5/1993	STANDARD	500	20.00	UNUSED	1/1/1947	32.89	111.46
325205111244001	D-06-09 27CBB		204	1411	9/26/1972	STANDARD	281	5.00	UNUSED	1/1/1966	32.87	111.41
325243111263700	D-06-09 29BBA1					STANDARD	1806	8.00	UNUSED	8/15/1978	32.88	111.44
325243111263701	D-06-09 29BBA1 PZ1		269	1273	2/28/1979	STANDARD	1202	1.25	UNUSED	8/15/1978	32.88	111.44
325243111263702	D-06-09 29BBA1 PZ2		261	1281	2/28/1979	STANDARD	625	1.25	UNUSED	8/15/1978	32.88	111.44
325243111263801	D-06-09 29BBA2					STANDARD	1150	6.00	UNUSED	5/10/1979	32.88	111.44
325243111263900	D-06-09 29BBA3					STANDARD	800	8.00	UNUSED	5/30/1979	32.88	111.44
325243111263901	D-06-09 29BBA3 PZ1		251	1291	11/14/2013	INDEX	780	2.00	UNUSED	5/30/1979	32.88	111.44
325243111264001	D-06-09 29BBA4		300	1242	11/14/2013	INDEX	1520	6.00	UNUSED	8/3/1979	32.88	111.44
325158111273901	D-06-09 30CCC		215	1290	2/1/1972	STANDARD	1165	20.00	IRRIGATION	1/1/1972	32.87	111.46
325200111273301	D-06-09 30CCD		60	1449	11/9/1993	STANDARD	390	20.00	UNUSED	6/15/1951	32.87	111.46
325143111251901	D-06-09 33ACB	638400	242	1346	12/4/2013	STANDARD	1100	20.00	UNUSED	6/26/1948	32.86	111.42
325139111241101	D-06-09 34ABC		172	1456	9/10/1948	STANDARD		8.00	UNUSED		32.86	111.40
325617111244801	D-06-09N04DDD	620899	308	1280	1/6/2014	INDEX	600	16.00	DOMESTIC	2/12/1943	32.94	111.41
325634111264801	D-06-09N06DAA	604213	246	1276	11/14/2012	INDEX	608	20.00	IRRIGATION	7/1/1940	32.94	111.45
325610111245101	D-06-09S04AAD	620900	310	1279	12/4/2013	STANDARD	556	16.00	IRRIGATION	5/4/1943	32.94	111.41
325601111272101	D-06-09S06BAD	621903	173	1337	11/5/1998	STANDARD	982		IRRIGATION		32.93	111.46
325607111272101	D-06-09S06BDD1		148	1279	3/6/1952	STANDARD		9.50	UNUSED		32.94	111.46
325606111272101	D-06-09S06BDD2		80	1431	3/1/1947	STANDARD	584	20.00	UNUSED	5/5/1947	32.94	111.46
325600111270701	D-06-09S06DCA		75	1445	5/1/1947	STANDARD	550	20.00	UNUSED	5/1/1947	32.93	111.45
325534111270801	D-06-09S06DCD	621909	230	1291	12/8/2003	STANDARD	1050	20.00	OBSERVATION	8/24/1959	32.92	111.45

Appendix G

ENVIRONMENTAL DATABASE REPORT

Allands

14947 W. Piccadilly Road, Goodyear, AZ 85395 • Phone: 623-535-7800 • Fax: 623-535-7900
www.allands.com • e-mail: sharon@allands.com

Historical Title and Environmental Research

SPECIAL DATABASE SEARCH

YOUR FILE NO: 011010 / Task 450

ALLANDS FILE NO: 2014-11-081D

DATE OF REPORT: December 3, 2014

ALLANDS hereby reports the search results of Federal and State Databases. Allands is not responsible for errors in the available records. The total liability is limited to the fee paid for this report. This is a confidential, privileged and protected document for the use of Clear Creek Associates.

1. The land referred to in this report is located in Pinal County, Arizona, described as follows:

Property located South of Kelk Road and East of Wheeler Road, being in the West half of Section 18, Township 6 South, Range 9 East, Gila and Salt River Base and Meridian.

REGULATORY DATABASE SEARCH SUMMARY

Database	Date of Database	Approximate Minimum Search Distance (miles)	Reported Facilities
Standard Federal ASTM Environmental Record Sources			
NPL (National Priorities List) / Proposed NPL / DOD (Department of Defense Sites)	10/14	3.0	0
Delisted National Priorities List	10/14	3.0	0
CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System)/No Further Remedial Action Planned (NFRAP)	01/14	3.0	0
RCRA (Resource Conservation and Recovery Act)	10/14	3.0	2
RCRA – CORRACTS TSDFs (Corrective Action Treatment, Storage, and Disposal Facilities)	10/14	3.0	0
RCRA – Non-CORRACTS TSDFs	10/14	3.0	0
ERNS (Emergency Response Notification System)	10/14	3.0	0
Standard State ASTM Environmental Record Sources			
WQARF (Water Quality Assurance Revolving Fund) Areas	10/14	3.0	0
Superfund Program List (replaces ACIDS)	08/04	3.0	0
Solid Waste Facilities/Landfill Sites – Operating and Closed	05/99 & 05/04	3.0	0
Brownfields / Voluntary Remediation Program	01/14	3.0	0
Registered USTs (Underground Storage Tanks) (includes Tribal Records)	03/14	3.0	3
LUSTs (Leaking Underground Storage Tanks) Incident Reports (includes Tribal Records)	03/14	3.0	1
Additional Environmental Record Sources			
RCRA Compliance Facilities	10/14	3.0	0
Hazardous Materials Incidents Emergency Response Logbook	1984-06/01	3.0	0
ADEQ Drywell Registration Database (includes Tribal Records)	10/14	3.0	0
Topographical / Aerial Maps	See text	3.0	2
DRYCLEANER	06/06	3.0	0
Arizona Department of Water Resources Well Registration Database	04/14	3.0	See Text

Allands contacts the appropriate sources on a quarterly basis to maintain currency of data

Standard Federal ASTM Environmental Record Sources

SUPERFUND NATIONAL PRIORITIES LIST (NPL)

Under Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act the Environmental Protection Agency established a National Priorities List (NPL) of Superfund sites. In addition, Proposed NPL and DOD (Department of Defense) Sites are researched in the section. These databases are provided by the EPA and the Arizona Department of Environmental Quality, dated October, 2014, and searched to identify all NPL/Proposed NPL/ DOD sites within a 3.0 mile search distance from subject property exterior boundaries.

Note: Due to inconsistency between the general area site description in the Narrative site information and the detailed site map, the distance/directions are determined based upon the most current site map available from ADEQ.

No National Priorities List (NPL) / Proposed NPL / DOD Sites were found located within a 3.0 mile search distance from subject property exterior boundaries.

DELISTED NATIONAL PRIORITIES LIST

Site may be delisted from the National Priorities List where no further response is appropriate. This database is provided by the Environmental Protection Agency, dated October, 2014, and searched to identify all Delisted NPL Sites within a 3.0 mile search distance from subject property exterior boundaries.

No Delisted National Priorities List (NPL) Sites were found located within a 3.0 mile search distance from subject property exterior boundaries.

FEDERAL CERCLIS / NFRAP LIST

The CERCLIS list contains sites which are either proposed to or on the NPL and sites which are in the screening and assessment phase for possible inclusion on the NPL. Those sites on the NFRAP list have no further remedial action planned. This database is provided by EPA dated January, 2014, and searched for facilities within a 3.0 mile search distance from subject property exterior boundaries.

No CERCLIS / NFRAP facilities were found located within a 3.0 mile search distance from subject property exterior boundaries.

RESOURCE CONSERVATION AND RECOVERY ACT FACILITIES (RCRA)

Under RCRA the Environmental Protection Agency compiles a database of facilities that are involved in the generation of hazardous materials. This database is from the Arizona Department of Environmental Quality RCRAInfo Database, dated October, 2014 and checked for Federal RCRA facilities located within a 3.0 mile search distance from subject property exterior boundaries.

EPA ID	FACILTY	ADDRESS	NOTIF. DATE	STATUS
AZE060500001	Loreal USA C/O Bright Corp	6300 N Airport Rd	9/30/2009	N
AZR000508028	Coolidge Generating Station	859 E Randolph Rd / 10/6s/8e	7/14/2009	CEG

CODES:

LQG: Large quantity generator (more than 1000 kg per month)
SQG: Small quantity generator (100 – 1000 kg per month)
CEG: Conditionally exempt small quantity generator (less than 100 kg per month)
N : Not a generator verified or inactive generator

CORRACTS FACILITIES

Under RCRA the Environmental Protection Agency compiles a database of Corrective Action Sites, sites with known contamination. Also known as the RCRA CORRACTS List, this is a list maintained by the EPA of RCRA sites at which contamination has been discovered and where some level of corrective clean-up activity has been undertaken. For example, a site may have been on the RCRA TSD or the RCRA Generators site list, and was placed on the CORRACTS list once contamination was discovered and remediation was underway. This database is dated October, 2014, and checked for facilities which occurred within a 3.0 mile search distance from subject property exterior boundaries.

No Facilities were found which occurred within a 3.0 mile search distance from subject property exterior boundaries.

TSD FACILITIES

Under RCRA the Environmental Protection Agency compiles a database of facilities that are involved in the transportation, treatment, storage, or disposal of hazardous materials. This database is from the Arizona Department of Environmental Quality Arizona Hazardous Waste Treatment, Storage and Disposal Facilities, dated October, 2014, and checked for Facilities which occurred within a 3.0 mile search distance from subject property exterior boundaries.

No TSD Facilities were found which occurred within a 3.0 mile search distance from subject property exterior boundaries.

FEDERAL EMERGENCY RESPONSE NOTIFICATION SYSTEM (ERNS) LIST

The ERNS list is a national database used to collect information on reported releases of oil and hazardous substances. This database is provided by the National Response Center and the EPA through the Right of Know Net by OMB Watch and Unison Institute from 1983 to October, 2014, and checked for incidents located within a 3.0 mile search distance from subject property exterior boundaries.

No incidents were found located within a 3.0 mile search distance from subject property exterior boundaries.

Standard State ASTM Environmental Record Sources

WATER QUALITY ASSURANCE REVOLVING FUND (WQARF)

The state of Arizona established a remedial program under A.R.S. 49-282 to facilitate the conservation and clean-up of Arizona drinking water and water sources. Under the authority of the WQARF program, the state actively identifies any actual or potential impact upon state waters, evaluates the extent of contamination, identifies parties responsible, and provides money grants to assist in clean-up activities. This database is provided by the Arizona Department of Environmental Quality dated October, 2014, and searched to identify all WQARF sites within a 3.0 mile search distance from subject property exterior boundaries.

Note: Due to inconsistency between the general area site description in the Narrative site information and the detailed site map, the distance/directions are determined based upon the most current site map available from ADEQ.

No WQARF Registry List sites were found located within a 3.0 mile search distance from subject property exterior boundaries.

ARIZONA SUPERFUND PROGRAM LIST

The Arizona Superfund Program List replaces the Arizona CERCLIS Information Data System (ACIDS) This list is more representative of the sites and potential sites within jurisdiction of the Arizona Department of Environmental Quality Superfund Programs Section (SPS). This database is provided by the Arizona Department of Environmental Quality, dated August, 2004, and searched to identify all sites within a 3.0 mile search distance from subject property exterior boundaries.

No facilities on the Arizona Superfund Program List were found located within a 3.0 mile search distance from subject property exterior boundaries.

Program Status codes:

Pending PI	WQARF Preliminary Investigation (PI) is scheduled or in process
On Registry	PI has resulted in inclusion of a site on the WQARF Registry
ACTIVE	The Department of Defense is presently addressing the site
On NPL	site has been listed on the CERCLA National Priorities List

LANDFILLS

The state of Arizona maintains listings of closed and permitted, operating landfills and solid waste dump sites. Lists of closed facilities are not necessarily complete - older dumping areas may not be documented. This database is from the Arizona Department of Environmental Quality Waste Programs Division; Solid Waste Section Directory of Arizona Active and Inactive Landfills dated May, 1999 and May, 2004, and checked for active and inactive landfills located within a 3.0 mile search distance from subject property exterior boundaries.

No active nor inactive landfills were found located within a 3.0 mile search distance from subject property exterior boundaries.

Codes:

MSWLF:	**Municipal Solid Waste Landfills**
CSWLF:	**Closed Solid Waste Landfills**
CSWOD:	**Closed Solid Waste Dumps**

BROWNFIELDS / VOLUNTARY CLEANUP PROGRAM

The Arizona Department of Environmental Quality has developed the AZURITE Database, reviewed through ADEQ GIS eMaps, which includes the ADEQ Voluntary Remediation Program and the ADEQ Brownfields Tracking System, dated January, 2014, and searched for sites which occurred within a 3.0 mile search distance from subject property exterior boundaries.

No brownfield sites were found which occurred within a 3.0 mile search distance from subject property exterior boundaries.

REGISTERED UNDERGROUND STORAGE TANKS (UST)

State (A.R.S. 49-1001 to 1014) and Federal (RCRA Subtitle I) laws require that persons who own or have owned underground storage tanks containing "regulated substances" complete a notification form and register the tank with the state. Tribal UST records are researched when subject property exterior boundaries are within search distance of Tribal lands. This database is from the Arizona Department of Environmental Quality UST Log dated March, 2014, and searched for UST sites located within a 3.0 mile search distance from subject property exterior boundaries.

Facility ID	Facility Name	Address	Tank No	Tank Inst Date	Closure Type	Closure Date
0-001653	City Of Coolidge - Municipal Airport	6300 N Airport Rd	1	1/1/1982		
0-001653	City Of Coolidge - Municipal Airport	6300 N Airport Rd	2	1/1/1982		
0-001653	City Of Coolidge - Municipal Airport	6300 N Airport Rd	3	1/1/1950	Removal	1/30/1996
0-003959	Paul S Prechel	7534 N Attaway Rd	1	1/22/1976	Removal	12/1/1990
0-003959	Paul S Prechel	7534 N Attaway Rd	2	1/22/1976	Removal	12/1/1990
0-003959	Paul S Prechel	7534 N Attaway Rd	3	1/21/1978	Removal	12/1/1990
0-008673	Coolidge Airport	No Address On File	1	1/1/1942	Removal	11/2/1995
0-008673	Coolidge Airport	No Address On File	2	1/1/1942	Removal	1/1/1960
0-008673	Coolidge Airport	No Address On File	3	1/1/1942	Removal	11/2/1995

DETAILS

NOTE: Details section is from the ADEQ 2003 UST list, newer lists do not provide this information.

Facility Id Facility Owner Id Owner
Tank No. Status Content Capacity Age Tank Material
Tank Release Detection Pipe Material Piping Type Pipe Release Detection

0-001653 ***Coolidge Municipal Airport*** Pinal Co. 869 City Of Coolidge
6300 N Airport Rd ,Coolidge AZ 85228
1 ACTV Aviation G 10000 Tank Tightness with Inventory Controls Bare Steel Pressure Automatic Line Leak Detectors Gasoline Line Tightness Testing
2 ACTV Jet Fuel 10000 Tank Tightness with Inventory Controls Bare Steel Pressure
3 REMV Aviation G 1000 Bare Steel Suction: Check Gasoline

0-003959 ***Paul S Prechel*** Pinal Co. 2594 Paul S Prechel
S Attaway Rd ,Coolidge AZ 85228
1 REMV Gasoline 1000 Galvanized Steel
2 REMV Gasoline 2000 Galvanized Steel
3 REMV Diesel 4000 Galvanized Steel

0-008673 ***Coolidge Airport*** Pinal Co. 5343 Us Army Corps Of Engineers
Airport Rd ,Coolidge AZ 85228
1 REMV Gasoline 12000 Bare Steel
2 REMV 2500 Bare Steel
3 REMV Diesel 290 Bare Steel

REGISTERED LEAKING UNDERGROUND STORAGE TANKS (LUST)

Owners of USTs are required to report to the Arizona Department of Environmental Quality any and all releases of tank contents for which ADEQ maintains an ongoing file documenting the nature of contamination and the status of each such incident. Tribal LUST records are researched when subject property exterior boundaries are within search distance of Tribal lands. This database is from the ADEQ LUST Log dated March, 2014, and searched for LUST sites located within a 3.0 mile search distance from subject property exterior boundaries.

ID	LUST ID NO	FACILITY	ADDRESS	DATE OPEN	DATE CLOSED	P CODE	DIST./ DIREC.
0-008673	4254.01 4254.02	Coolidge Airport	Airport Road	11/2/1995 11/15/1995	3/10/2000 3/18/1996	5S 7	3.0 mi. NE

P CODE (Leaking UST Priority):

5S	Closed case for suspected release (false alarm)
7	LUST case close-out involving combination with other LUST number/case at the same facility

Additional Environmental Record Sources

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) COMPLIANCE FACILITIES

The RCRA Compliance Log lists facilities that have been or presently are under investigation for non-compliance with RCRA regulations. Inclusion of any facility on this list indicates a history of compliance problems and RCRA regulatory violation. This database is from the Arizona Department of Environmental Quality RCRA Compliance Log, dated October, 2014, and searched for compliance facilities within a 3.0 mile search distance from subject property exterior boundaries.

No compliance facilities were found located within a 3.0 mile search distance from subject property exterior boundaries.

HAZARDOUS MATERIAL INCIDENTS

The Arizona Department of Environmental Quality (ADEQ) Response Team documents spills and incidents involving hazardous materials that are reported to the unit. This database is from the Arizona Department of Environmental Quality Emergency Response Log from 1984 through June, 2001, and checked for hazardous material incidents located within a 3.0 mile search distance from subject property exterior boundaries.

No hazardous material incidents were found located within a 3.0 mile search distance from subject property exterior boundaries.

ADEQ DRY WELL REGISTRATION DATA BASE

Dry wells are constructed for the purpose of collecting storm waters. Dry wells are required to be registered with ADEQ. Tribal Drywell records are researched when subject property exterior boundaries are within search distance of Tribal lands. This database is from the ADEQ dry well registration database dated October, 2014, and searched for dry wells located within a 3.0 mile search distance from subject property exterior boundaries.

No registered dry wells were found located within a 3.0 mile search distance from subject property exterior boundaries.

USGS 7.5 MINUTE TOPOGRAPHICAL MAPS AERIAL PHOTOS

The United States Geological Survey Topographic maps and Aerial Photos are derived from Terrain Navigator Software from My Topo, a Trimble Company. (www.mytopo.com) and are for informational purposes only.

NAME	TYPE	DATE	REVISION	CONTOUR INTERVAL
Valley Farms	Topo	1992	None	5 feet
Bing	Aerial	2014		

DRYCLEANERS

The Drycleaners Inventory List summarizes current and historic dry cleaners sites throughout the state of Arizona and is not all inclusive. This database is from the Report for the Arizona Department of Environmental Quality Dry Cleaners Inventory Project, dated June, 2006, and searched for dry cleaners sites located within a 3.0 mile search distance from subject property exterior boundaries.

No drycleaners were found located within a 3.0 mile search distance from subject property exterior boundaries.

ARIZONA DEPARTMENT OF WATER RESOURCES
WELL REPORT

This database is from the Arizona Department of Water Resources Well Report Operations Division Report, dated April, 2014. This report identifies existing wells sequenced by legal description and checked for inclusion of subject site and adjacent properties within 3 miles.

Imaged Records are available at: http://www.water.az.gov/adwr/Content/ImagedRecords/default.htm

Water Uses (WU)

A	Irrigation
B	Utility (Water Co.)
C	Commercial
D	Domestic
E	Municipal
F	Industrial
G	Recreational
H	Remediation
I	Mining
J	Stock
K	Other - Exploration
L	Drainage
M	Monitoring
N	None
O	Other - Non-Production
P	Remediation
R	Recharge
T	Test
U	Unknown
V	Dewatering

Legal Description

T	Township
N/S	North or South
R	Range
E/W	East or West
S	Section
Q1	Quarter of Section (160 Acres)
Q2	Quarter Quarter of Section (40 Acres)
Q3	Quarter Quarter Quarter of Section (10 acres)
ID	Well Registration Number
WD	Well Depth
WL	Water Level
DIA	Casing width

ID	T	N/S	R	E/W	S	Q1	Q2	Q3	WU	WD	WL	DIA	Name
633911	5	S	9	E	31	SE	SE	SE	D	360	230	6	Cole,M F
621954	5	S	9	E	31	SW	NE	NE	A	1137	209	16	San Carlos Irrig,
604214	5	S	9	E	32	SE	NW	SE	A	1105	240	20	Neely, Rex,
604215	5	S	9	E	32	SW	SW	SW	D	600	240	6	Neely, Rex,
606778	6	S	8	E	1	NW	SW	NE	A	1752	337	16	Cardinal, Trs
606777	6	S	8	E	1	NW	SW	NE	A	602	210	20	Cardinal, Trs
605561	6	S	8	E	1	SE	SW	SW	D	401	215	10	Holland,H
610583	6	S	8	E	2	NE	NE	NE	A	1440	153	13	Mesa, City Of,
610585	6	S	8	E	2	NE	NE	SW	A	490	350	20	Mesa, City Of,
610584	6	S	8	E	2	NE	SE	SE	A	402	350	20	Pen, John & Lois,
533191	6	S	8	E	2	NE	SE	SE	N	230	0	0	Sw Gas Corp,
617563	6	S	8	E	2	NW	SE	SE	A	0	0	0	Mesa, City Of,
617565	6	S	8	E	2	SE	NE	SE	A	0	0	0	Mesa, City Of,

ARIZONA DEPARTMENT OF WATER RESOURCES
WELL REPORT (cont.)

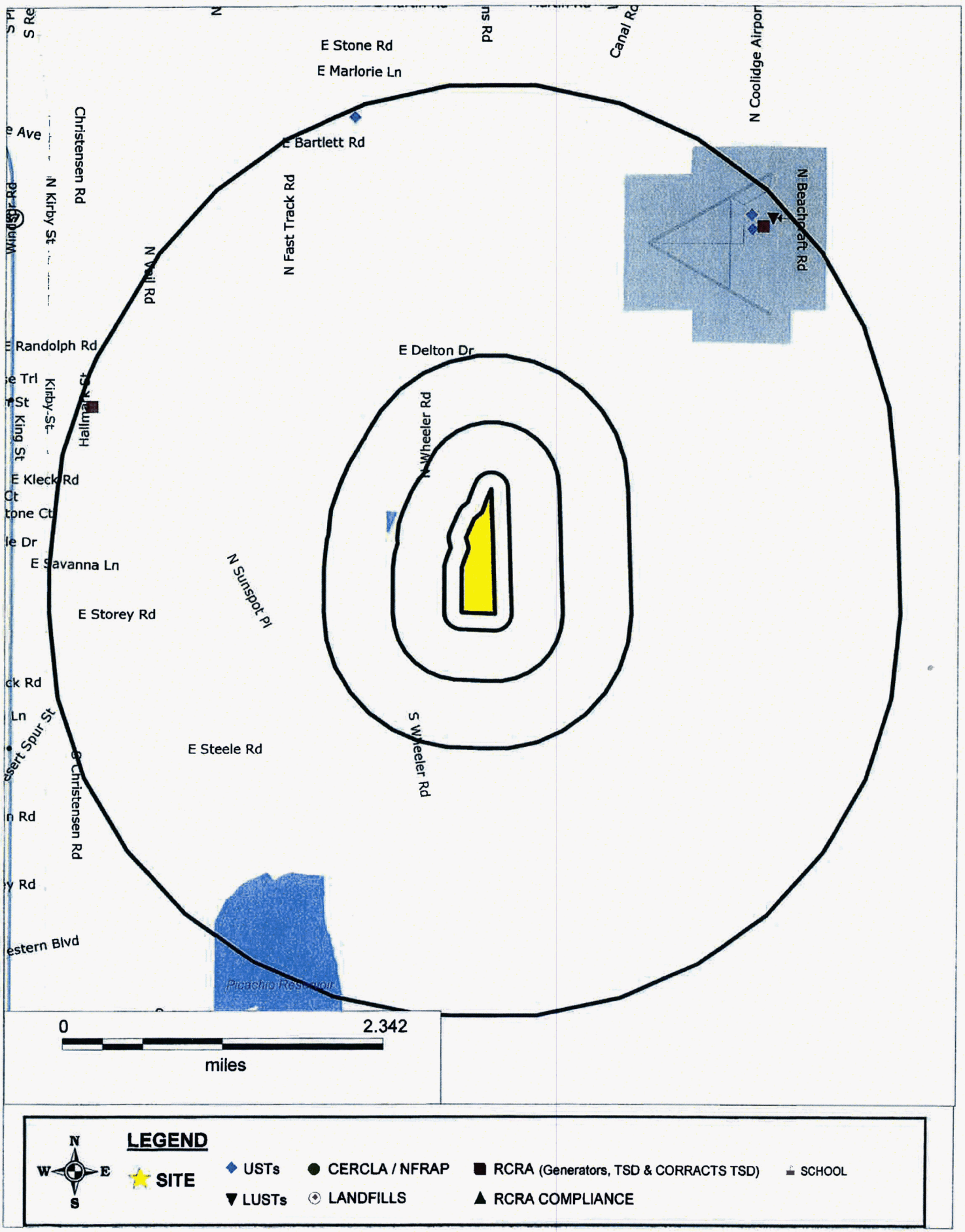
ID	T	N/S	R	E/W	S	Q1	Q2	Q3	WU	WD	WL	DIA	Name
617777	6	S	8	E	2	SE	SE	NE	A	0	0	0	Mesa, City Of,
617776	6	S	8	E	2	SE	SE	SE	A	0	0	0	Mesa, City Of,
617564	6	S	8	E	2	SW	NE	SW	A	0	0	0	Mesa, City Of,
617775	6	S	8	E	2	SW	SE	SE	D	0	0	0	Mcfarland,B C
907688	6	S	8	E	3				N	60	59	8	El Paso Natural Gas, Attn: William Baltz
605237	6	S	8	E	3	SE	NE	SE	A	360	160	20	Freeman
605239	6	S	8	E	3	SE	SE	NE	A	300	160	20	Freeman
805408	6	S	8	E	3	SE	SE	SE	D	350	0	20	N.S.K. & B. Prtshp,
605242	6	S	8	E	3	SE	SE	SE	D	300	160	20	Peterson,G E
809361	6	S	8	E	3	SE	SW	SE		570	230	16	Freeman
605238	6	S	8	E	3	SE	SW	SW	A	800	160	20	Freeman
525240	6	S	8	E	10	NE	NW	NW	M	0	0	0	Sunbelt Refining Co,
524748	6	S	8	E	10	NE	NW	SW	M	35	0	10	Sunbelt Refining Co,
218256	6	S	8	E	10	NE	SE	SE					Coolidge Power Llc
617778	6	S	8	E	10	NE	SE	SE	A	806	60	20	Coolidge Power Llc
218257	6	S	8	E	10	NE	SE	SE					Coolidge Power Llc
910128	6	S	8	E	10	NW							Coolidge Power, Llc Attn: John Cassady
617774	6	S	8	E	10	SE	SE	NE	D	0	0	0	Mcfarland,B C
617780	6	S	8	E	10	SE	SE	SW	A	610	176	16	Mesa, City Of,
617779	6	S	8	E	10	SE	SW	SW	A	0	0	0	Mesa, City Of,
805285	6	S	8	E	11	NE	NE	NE	D	0	10	0	McFarland, Bonnye,C
617558	6	S	8	E	11	NE	SE	NE	A	0	0	0	Mesa, City Of,
617559	6	S	8	E	11	NE	SE	NE	A	0	0	0	Mesa, City Of,
617560	6	S	8	E	11	NE	SE	SW	A	0	0	0	Mesa, City Of,
617557	6	S	8	E	11	NW	SE	NE	A	0	0	0	Mesa, City Of,
617561	6	S	8	E	11	SE	SE	NE	A	0	0	0	Mesa, City Of,
518655	6	S	8	E	11	SE	SE	SE	C	0	0	0	Connolly Invest Corp,
523310	6	S	8	E	11	SE	SE	SE	D	0	0	0	Connolly Invest Corp,
617562	6	S	8	E	11	SE	SE	SE	A	0	0	0	Mesa, City Of,
530066	6	S	8	E	11	SW	SW	NE	D	300	80	10	Vail 160 Llc
634731	6	S	8	E	12	NE	NE	NE	D	0	0	0	Valley National Bank,
609758	6	S	8	E	13	NE	NE	NE	A	1200	0	20	Goree,R L
609762	6	S	8	E	13	NE	NE	NW	D	141	0	6	Goree,R L
609759	6	S	8	E	13	NE	NE	SE	A	500	0	20	Goree,R L
550668	6	S	8	E	14	NE	SE	SE	N	500	0	8	El Paso Natural Gas,
507832	6	S	8	E	14	SE	SW	NE	D	440	160	6	Cooper, Theodore,J
507871	6	S	8	E	14	SE	SW	NW	D	350	180	6	Martin
504821	6	S	8	E	14	SE	SW	SE	D	360	150	6	Cooper,T J
625234	6	S	8	E	14	SW	SW	SW	A	450	300	20	Mesa, City Of,

ARIZONA DEPARTMENT OF WATER RESOURCES
WELL REPORT (cont.)

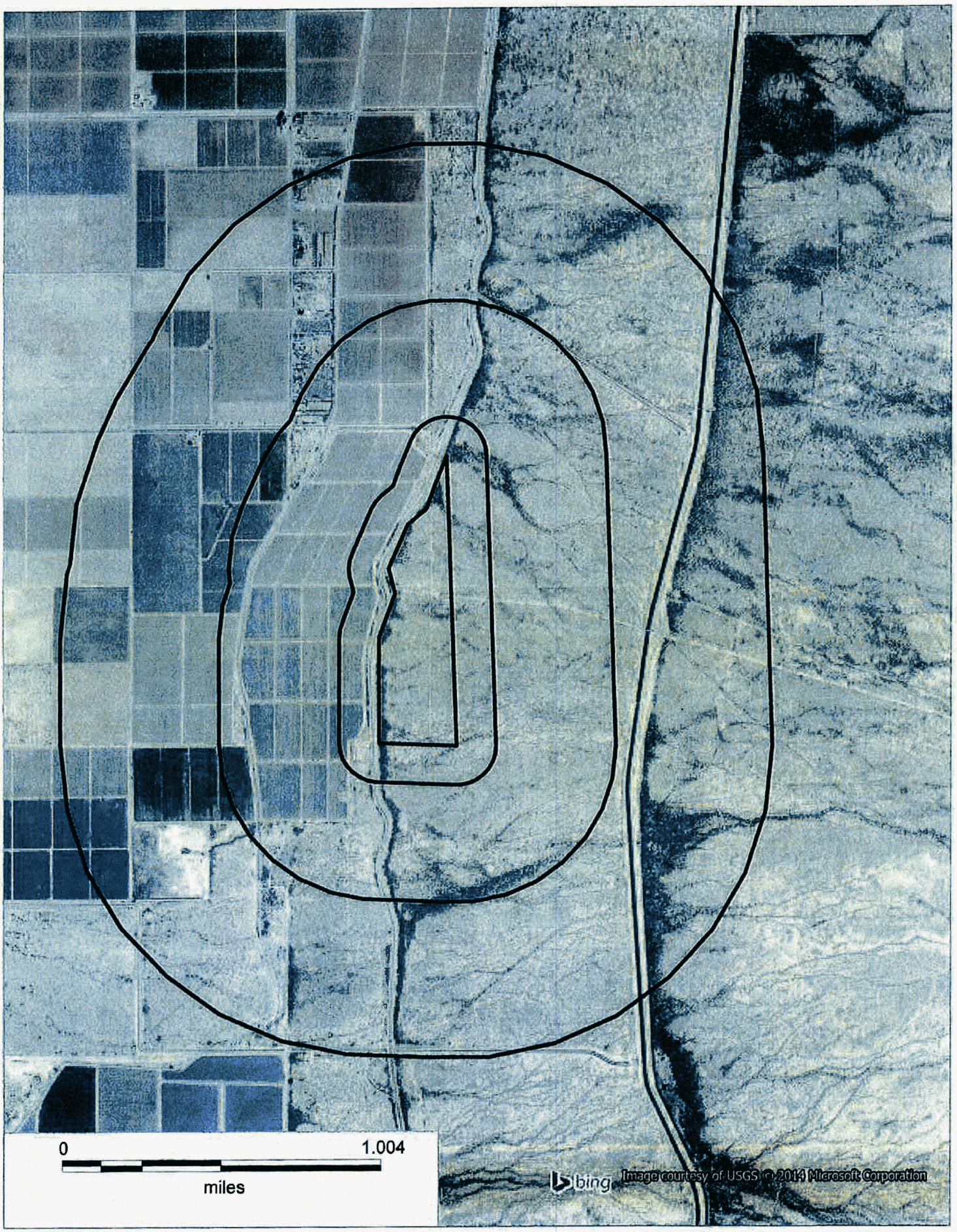
ID	T	N/S	R	E/W	S	Q1	Q2	Q3	WU	WD	WL	DIA	Name
625235	6	S	8	E	15	SE	SW	SW	A	400	250	12	Mesa, City Of,
638418	6	S	8	E	22				D	400	220	8	Dickerson,M
625239	6	S	8	E	22	NE	SE	SE	A	500	350	16	Mesa, City Of,
625238	6	S	8	E	22	NE	SE	SW	A	600	350	16	Mesa, City Of,
625237	6	S	8	E	22	NE	SW	SE	A	600	350	16	Mesa, City Of,
622458	6	S	8	E	23	NE	NE	NE	A	600	250	20	Mesa, City Of,
622457	6	S	8	E	23	NW	SE	SE	A	1000	250	20	Mesa, City Of,
625241	6	S	8	E	23	SE	NE	NE	A	500	350	16	Mesa, City Of,
625242	6	S	8	E	23	SE	SE	SW	A	500	350	12	Mesa, City Of,
622463	6	S	8	E	24	NE	SE	SE	D	0	250	20	Brown Land Cattle Co,
625243	6	S	8	E	24	NE	SE	SE	A	1900	350	20	Mesa, City Of,
807475	6	S	8	E	24	NW	SE	SE	D	300	0	20	Mesa, City Of,
622460	6	S	8	E	24	NW	SE	SE	A	800	300	20	Mesa, City Of,
526158	6	S	8	E	24	SE	SW	NE	D	500	150	6	Brebeton, Margaret,
625222	6	S	8	E	25	NE	NE	NE	A	600	380	20	Inland Farms Inc,
625225	6	S	8	E	25	NE	NW	NW	A	500	380	20	Inland Farms Inc,
625223	6	S	8	E	25	NE	SE	SE	A	1600	380	16	Inland Farms Inc,
625224	6	S	8	E	25	SE	SE	SW	A	600	400	16	Inland Farms Inc,
212344	6	S	8	E	26	NE	NE	SW	D				Clark
904706	6	S	8	E	26	NE	NW	NE	D	400	130	6	Cedar Creek/Kay Davis
622461	6	S	8	E	26	NW	NE	SE	A	800	300	16	Mesa, City Of,
512225	6	S	8	E	27	NE	NW	NE	J	650	230	12	Goldman Dairy Inc,
508445	6	S	8	E	27	NE	NW	SE	F	0	0	0	Goldman Land Co,
620635	6	S	8	E	27	NE	SW	SW	A	400	325	20	Goldman Dairy Inc,
620634	6	S	8	E	27	SE	SE	SE	A	400	325	20	Ochoa Brothers,
604213	6	S	9	E	6	NE	NE	NE	A	1000	240	20	Neely, Rex,
621903	6	S	9	E	6	NE	SW	NW	A	982	225	16	San Carlos Irrig,
621909	6	S	9	E	6	SE	SE	SW	A	1020	211	20	San Carlos Irrig,
638443	6	S	9	E	7				D	200	120	4	Mitchell,H A
639047	6	S	9	E	7				D	0	0	0	Lewis,L C
634025	6	S	9	E	7	NW			A	0	120	6	Mitchellet Al,R
594042	6	S	9	E	7	NW	NW	NE	D	300	85	6	Skiles Sr
639695	6	S	9	E	7	NW	NW	NW	D	200	125	6	Harris,I C
525629	6	S	9	E	7	NW	NW	NW	N	228	0	0	Southwest Gas Corp,
610635	6	S	9	E	7	NW	NW	SW	J	350	0	6	Rotz,J L
581230	6	S	9	E	7	NW	SW	NW	D	500	300	5	Cantu
597046	6	S	9	E	7	NW	SW	NW	D				Cantu

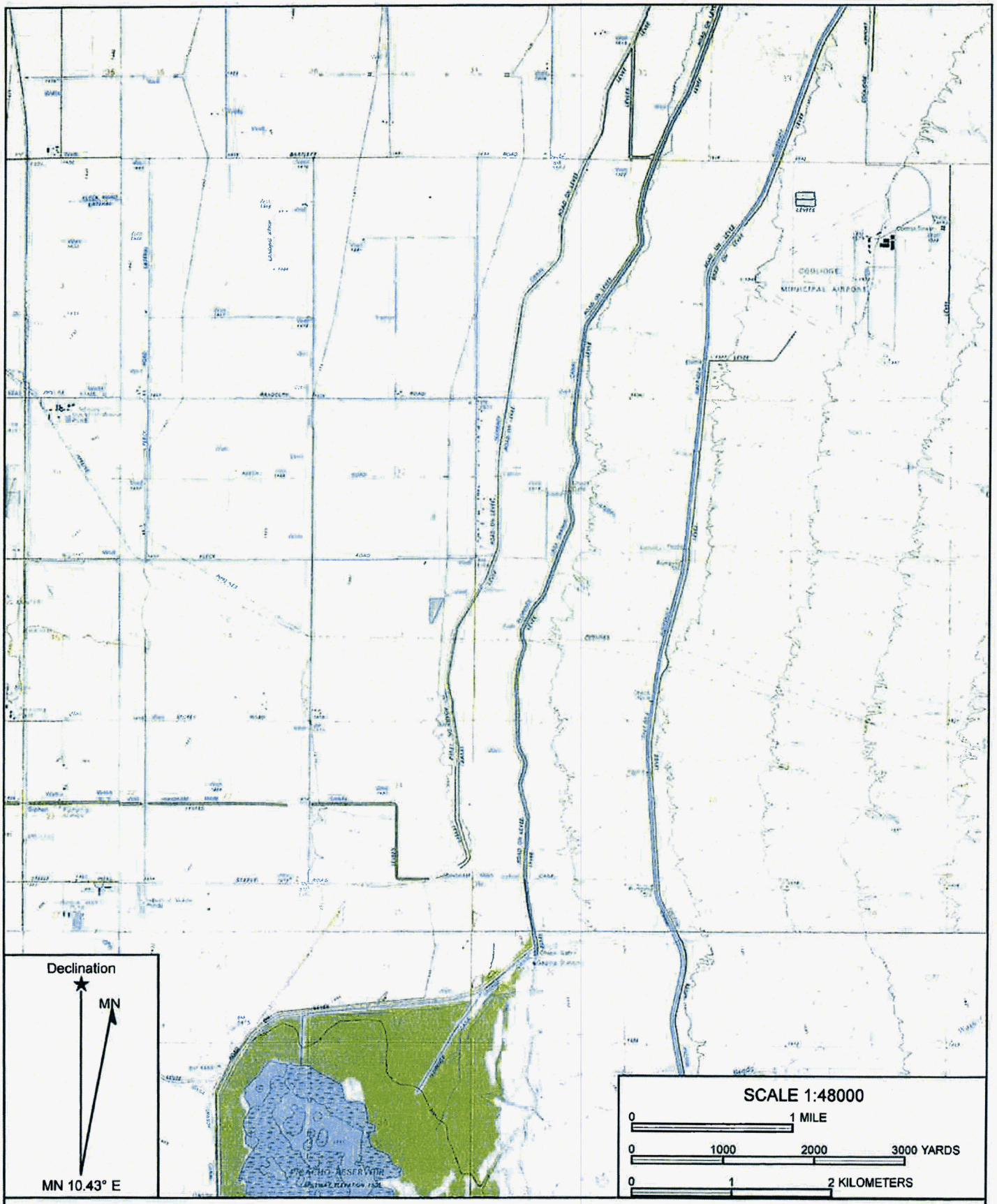
ARIZONA DEPARTMENT OF WATER RESOURCES
WELL REPORT (cont.)

ID	T	NS	R	EW	S	Q1	Q2	Q3	WU	WD	WI	DIA	NAME
514011	6	S	9	E	7	NW	SW	SW	D	0	0	0	Carter, Tony,L
522489	6	S	9	E	7	NW	SW	SW	D	0	0	0	Carter, Tony & Betty,
503714	6	S	9	E	7	SW	NE	NE	A	0	310	0	Holland,H
605556	6	S	9	E	7	SW	NE	NE	A	1077	228	20	All State Associates Of Holland Ii-945, L.L.C.
638440	6	S	9	E	7	SW	NW	NW	D	220	118	6	Carter,C
605559	6	S	9	E	7	SW	SE	SE	A	1600	274	20	
605557	6	S	9	E	7	SW	SE	SE	A	500	196	20	All State Associates Of Holland Ii-945, L.L.C.
622456	6	S	9	E	18	NW	NE	SW	A	1420	250	20	Mesa, City Of,
622462	6	S	9	E	18	NW	SE	SW	A	1500	250	20	Mesa, City Of,
622459	6	S	9	E	19	NW	NW	SE	A	800	300	20	Mesa, City Of,
515452	6	S	9	E	21	NE			N	300	0	8	All Am. Pipeline,
548748	6	S	9	E	22	NW	NW	NW	N	400	0	0	All American Pipeline,
638400	6	S	9	E	33	NE	SW	NW	D	1200	0	20	Shepley Ranch Llc
615435	6	S	9	E	33	NW	NE	SE	J	1200	0	20	Az State Land Dept,


E Stone Rd
E Marlorie Ln
E Bartlett Rd
N Coolidge Airport
Canal Rd
N Beechcraft Rd
Christensen Rd
N Kirby St
N Fast Track Rd
N Vail Rd
E Randolph Rd
E Delton Dr
N Wheeler Rd
Hallmark Dr
E Kleck Rd
E Savanna Ln
N Sunspot Pl
E Storey Rd
E Steele Rd
S Wheeler Rd
S Christensen Rd
Picacho Reservoir
0
2.342
miles
LEGEND
N
W
E
S
SITE
USTs
LUSTs
CERCLA / NFRAP
LANDFILLS
RCRA (Generators, TSD & CORRACTS TSD)
RCRA COMPLIANCE
SCHOOL

0
2.342
miles
bing
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2014 Microsoft Corporation


0
1.004
miles
bing
Image courtesy of USGS © 2014 Microsoft Corporation



Name: VALLEY FARMS
Date: 12/03/14
Scale: 1 inch = 4,000 ft.

Location: 032° 54' 16.18" N, 111° 27' 35.39" W
2014-11-081

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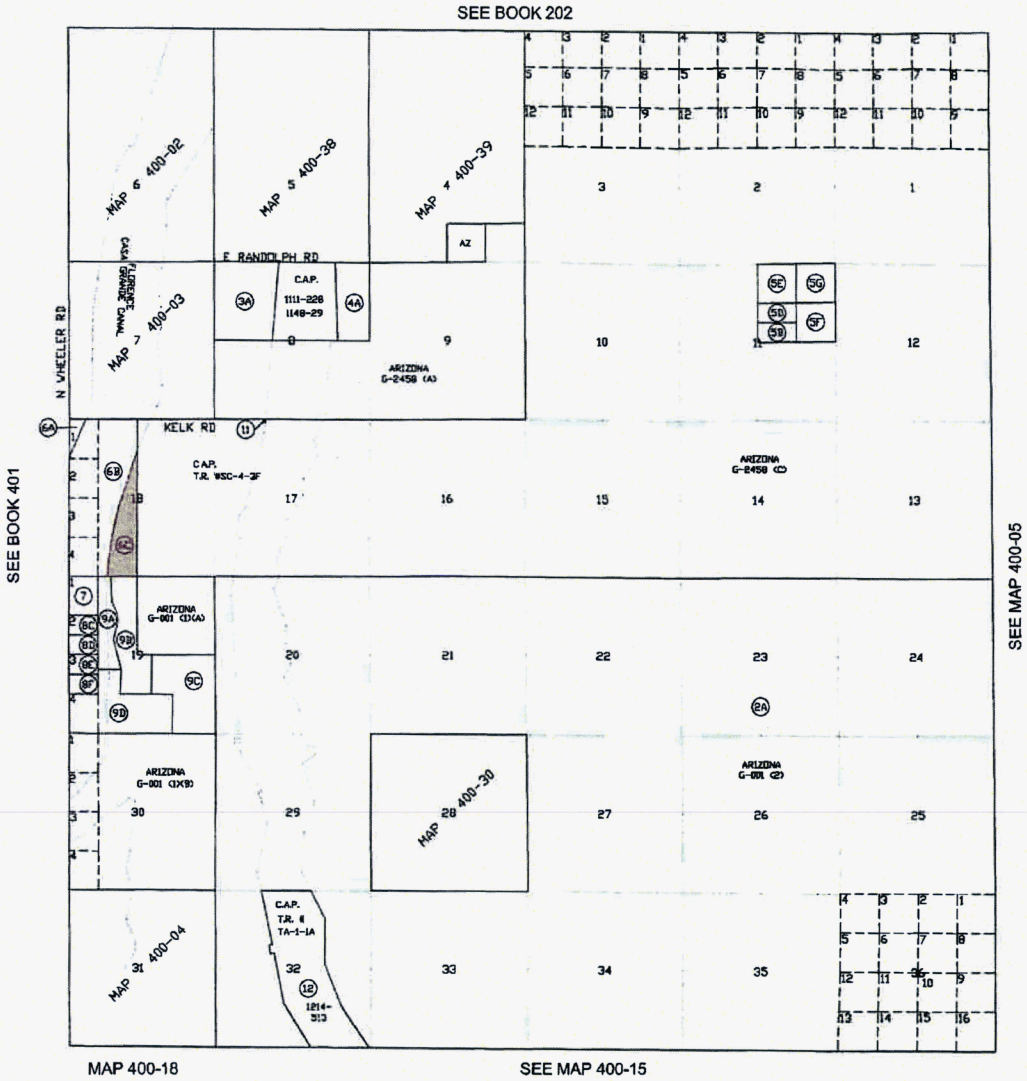
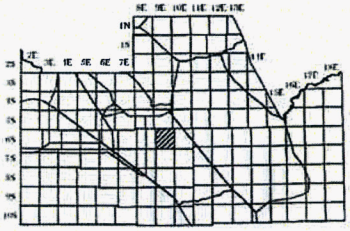
TN.06S RG.09E

400-01

THIS MAP IS FOR VALUATION PURPOSES ONLY. THIS OFFICE WILL NOT ASSUME LIABILITY FOR REPRESENTATION, MEASUREMENTS OR ACREAGE SURVEYS & SUBDIVISION PLATS ARE ON FILE WITH THE PINAL COUNTY RECORDER'S OFFICE.



LOCATION MAP



SCALE: 1" = 4000'

5-14-2008

UPDATED BY CC

PINAL COUNTY ASSESSORS MAP

Parcel Search*

Start a New Search

Search Results (1 Entries)

Parcel Details (400-01-006C)

open

open

Previous year valuations are subject to change as prescribed in the Arizona Revised Statutes. All changes in value may not be reflected in this data. For updated/correct figures, please refer to the Treasurer's Office website.

Link to This Parcel | Print View

Parcel Number 400-01-006C shows the following information for Tax Year: 2015 Tax Year Chart

Parcel Number:	400-01-006C (Taxing Information)				
Section:	18	**Township:**	06S	**Range:**	09E
Atlas Number:	081-18	**Map:**	View Parcel Map		
Property Description: (What is this?)					
THAT PART OF E1/2 W1/2 OF SEC 18-6S-9E LYING E OF CANAL 49.50 AC + OR -					

Primary Owner:	ARIZONA WATER COMPANY
Name 2:	
In C/O:	
Tax Bill Mailing Address	
Address:	PO BOX 29006
City:	PHOENIX
State:	AZ
Zip Code:	85038

Date of Sale:	1/13/2005
Sale Amount:	$661,830.00
Document(s):	
2005-004484 2004-042729	

Property Address (Location):							
Subdivision:							
Unit:		**Block:**		**Lot:**		**Phase:**	
Cabinet:				**Slide:**			

Imp:	0.00	**Item:**	
Const year:	0	**Grnd Flr Perim:**	0
Stories:		**Total Sq. Ft.:**	0

Parcel Size:	49.50
Size Indicator:	Acres
Tax Area Code:	0162 (Rates current as of 2013)
Use Code:	0004

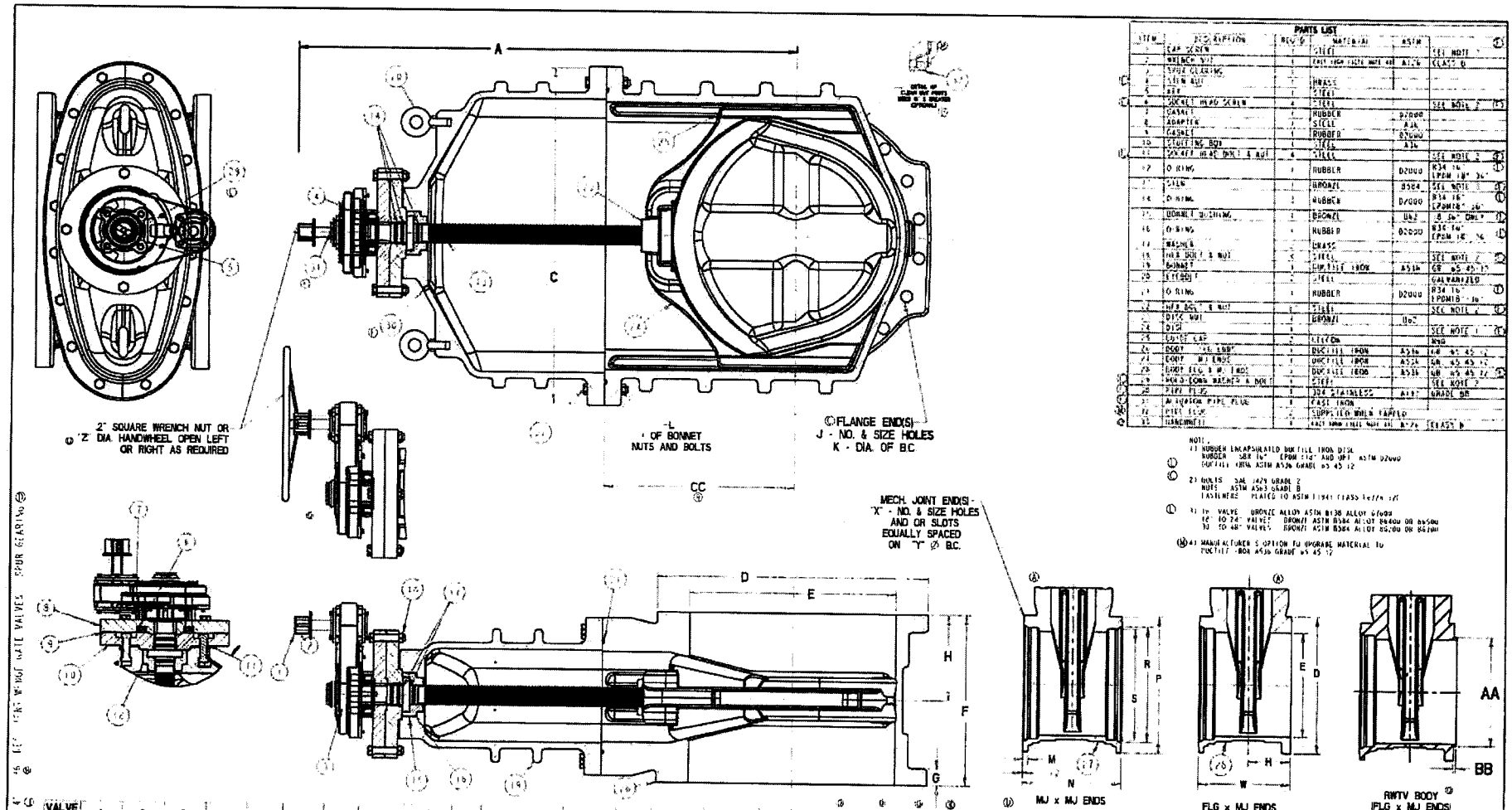
Land Legal Class:	02RL - Vacant Land / Non-Profit Imp
Impr. Legal Class:	
Full Cash Value (FCV):	$32,817.00
Limited Value (LPV):	$32,817.00
Real Property Ratio:	
Assessed FCV:	$5,251.00
Assessed LPV:	$5,251.00

Attached Personal Property:	No Personal Property Listed

*The data presented on this website is deemed reliable but not guaranteed. This information should be used for informational use only and does not constitute a legal document for the description of these properties. The Pinal County Assessor's Office disclaims any responsibility or liability for any direct or indirect damages resulting from the use of this data.

Appendix H

FLOW MEASUREMENT DEVICE SPECIFICATIONS



VALVE SIZE	A	C	D	E	F	G	H	J	K	L	M	N	P	R	S	W	X	Y	Z	AA	BB	CC	TURNS TO OPEN ALL SIZES 4.31	WEIGHT
14	40.49	24.93	24.00	14.38	15.44	1.42	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	14.88	176	800
16	42.55	24.93	3.50	16.00	16.06	1.56	8.03	[illegible]	[illegible]	[illegible]	[illegible]	19.75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1000
20	49.41	30.50	25.00	18.12	17.00	1.69	9.38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	224	[illegible]
30	59.15	39.50	32.00	24.25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	258	[illegible]
36	70.8	46.00	[illegible]	30.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	108	[illegible]
48	[illegible]	[illegible]	46.00	36.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	351	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	455	[illegible]

PARTS LIST

ITEM	DESCRIPTION	REQ'D	MATERIAL	ASTM	
1	CAP SCREW	1	STEEL		SEE NOTE 1
2	WRENCH NUT	1	CAST IRON (SEE NOTE 4B)	A126	CLASS B
3	STEM CLEARING	1			
4	STEM NUT	1	BRASS		
5	KEY	1	STEEL		
6	SOCKET HEAD SCREW	4	STEEL		SEE NOTE 2
7	GASKET	1	RUBBER	D2000	
8	ADAPTER	1	STEEL	A36	
9	GASKET	1	RUBBER	D2000	
10	STUFFING BOX	1	STEEL	A36	
11	GRAFF HEAD BOLT & NUT	4	STEEL		SEE NOTE 3
12	O RING	1	RUBBER	D2000	R34 16" (FROM 14" 36")
13	STEM	1	BRONZE	B584	SEE NOTE 1
14	O RING	1	RUBBER	D2000	R34 16" (FROM 18" 36")
15	BONNET BUSHING	1	BRONZE	B62	(8 36" ONLY)
16	O RING	1	RUBBER	D2000	R34 16" (FROM 18" 36")
17	WASHER	1	BRASS		
18	HEX BOLT & NUT	5	STEEL		SEE NOTE 2
19	BONNET	1	DUCTILE IRON	A536	GR 65 45 12
20	STUDS	1	STEEL		GALVANIZED
21	O RING	1	RUBBER	D2000	R34 16" (FROM 18" 36")
22	HEX BOLT & NUT	1	STEEL		SEE NOTE 2
23	DISC NUT	1	BRONZE	B62	
24	DISC	1			SEE NOTE 1
25	SEATS CAP	1	ELASTOMER		NBR
26	BODY "XL END"	1	DUCTILE IRON	A536	GR 65 45 12
27	BODY MJ ENDS	1	DUCTILE IRON	A536	GR 65 45 12
28	BODY FLG & MJ ENDS	1	DUCTILE IRON	A536	GR 65 45 12
29	HEX-HEAD CAP SCREWS & NUTS	1	STEEL		SEE NOTE 2
30	PIPE PLUG	1	304 STAINLESS	A182	GRADE F8
31	AIR VENTING PIPE PLUG	1	CAST IRON		
32	PIPE PLUG	1	SUPPLIED WHEN TAPPED		
33	NAMEPLATE	1	CAST IRON (SEE NOTE 4B)	A126	CLASS B

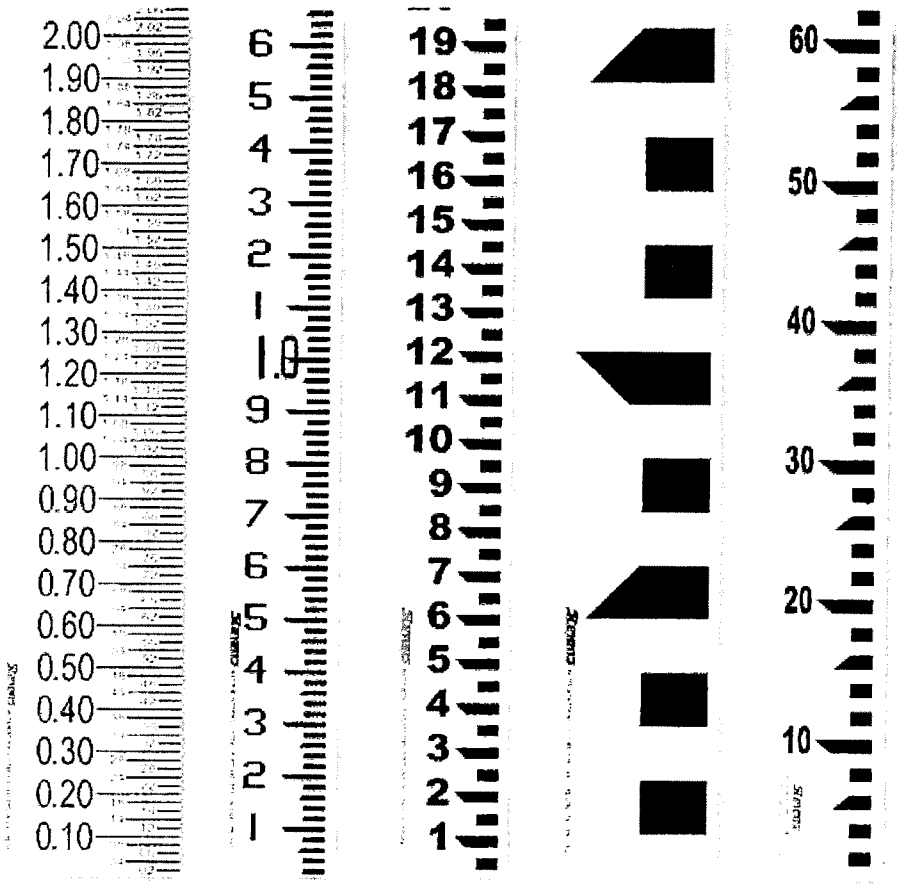
NOTE:
1) RUBBER ENCAPSULATED DUCTILE IRON DISK
RUBBER SBR 16" (FROM 14" AND UP) ASTM D2000
DUCTILE IRON ASTM A536 GRADE 65 45 12
2) BOLTS SAE J429 GRADE 2
NUTS ASTM A563 GRADE B
FASTENERS PLATED TO ASTM B1941 CLASS 1 or/or 2/2
3) 14" VALVE BRONZE ALLOY ASTM B138 ALLOY C95400
16" TO 24" VALVE: BRONZE ASTM B584 ALLOY 84400 OR 84500
30" TO 48" VALVE: BRONZE ASTM B584 ALLOY 85200 OR 84200
4) MANUFACTURER'S OPTION TO UPGRADE MATERIAL TO DUCTILE IRON A536 GRADE 65 45 12

APPROVED

Mueller Co.

MULLER CONFIDENTIAL TITLE TO AND OWNERSHIP OF THIS ENGINEERING DATA REMAINS IN MULLER COMPANY. NO USE IS TO BE MADE OF THIS DATA EXCEPT AS SPECIFICALLY AUTHORIZED BY MULLER COMPANY. ASSENT ON THE PART OF THE RECIPIENTS TO THESE CONDITIONS IS PRESUMED.

Porcelain Enameled Standard & Custom Staff Gages



Style A *Style C* *Style I* *Style E* *Style M*

Description

The Staff Gage has a long history of providing a direct visual indicator for determining water level. Stevens staff gages are designed for easy mounting to a wall or pier, with heavy metal grommets and a 0.188 inch opening for screws or nails.

Each gage consists of a metal core, coated with porcelain enamel and marked with accurate measurement markings at specific intervals. The metal core is heavy 16 gauge (0.075 in / 1.9 mm) iron, which is completely covered with a baked-on porcelain enamel finish to resist rust or discoloration. Different colors of enamel are used to provide the markings; typically black numbers on a white background. Stevens staff gages are designed for years of trouble-free use, and can be easily cleaned.

Custom Staff Gages - a unique service offered by Stevens Water!

Stevens designs and provides custom staff gages for applications requiring larger displays, unique mounting angles, slopes or visual flow measurements.

www.stevenswater.com 1.800.452.5272

Stevens - The original developer of Style A, C, I, E & M staff gages

Features

- Time-proven basic visual reference of water level measurement
- Easy to see and read
- Available in many standard sizes (english or metric)
- Custom scales, sizes and colors available
- Pre-numbered or "build your own" options
- Rugged and durable weather resistant design

Applications

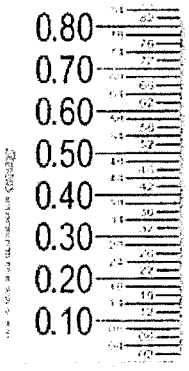
- Rivers, lakes, streams, dams and reservoirs
- Wastewater treatment plants
- Flumes and weirs
- Visual flow measurement
- Tanks

Stevens®
Water Monitoring Systems, Inc.

Standard Staff Gages Styles

Style A

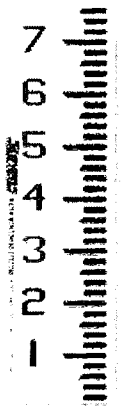
The Style A staff gage is 4 inches wide and comes in 3.33 ft. sections. The standard maximum height is 13.33 feet. The Style A has graduated marks every ft., 1/10th ft., and 0.02 ft. with total elevations.



Part Number	Range
15415	0 to 3.33 feet
15395	3.33 to 6.66 feet
15396	6.66 to 10.0 feet
15397	10.0 to 13.33 feet
15398	13.33 to 16.66 feet

Style C

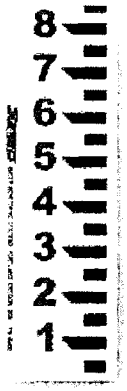
The Style C staff gage is 2.5 inches wide and is available in separate lengths of 0 - 1.06 feet., 0 - 1.56 feet, 0 - 1.56 feet, 0 - 2.06 feet, 0 - 3.06 feet, 0 - 4.06 feet, and 3.06 - 5.06 feet. Style C also comes in standard 3.33 ft. sections. Style C has graduations every 100th of a foot with numerical marks every ft. and every tenth of a ft.



Part Number	Range	Part Number	Range
15402	0 to 1.06 ft.	15409	13.33 to 16.66 ft.
15403	0 to 1.56 ft.	15410	16.66 to 20.00 ft.
15404	0 2.06 ft.	15411	20.00 to 23.33 ft.
15418	0 to 3.06 ft.	15412	23.33 to 26.66 ft.
15419	3.06 to 5.06 ft.	15413	26.66 to 30.00 ft.
43082	0 to 4.06 ft.	15414	30.00 to 33.33 ft.
15405	0 to 3.33 ft.	14509	33.33 to 36.66 ft.
15406	3.33 to 6.66 ft.	14510	36.66 to 40.00 ft.
15407	6.66 to 10.00 ft.	14511	40.00 to 43.33 ft.
15408	10.00 to 13.33 ft.	Please contact Stevens for availability of other ranges.	

Style I

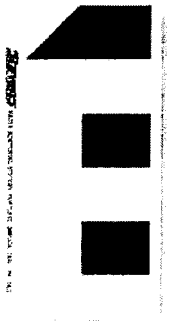
The Style I staff gage is 2.5 inches wide and has graduation every 0.25 inches with numerical marks every inch. Style I is available in any length ranging from 0 to 48 inches.



Part Number	Range
90223	0 to 14.0 inches
44405	0 to 18.0 inches
44406	0 to 24.0 inches
44407	0 to 30.0 inches
45637	0 to 36.0 inches
45480	0 to 48.0 inches

Style E

The Style E is an English measurement staff gage that is 3.5 inches wide and is available in 1, 2 or 5 ft. sections. Style E is graduated in feet every tenth of a ft. Separate figure plates (see below) can be fastened on a pier, wall or other surface next to the Style E staff gage to number any desired elevation.



Part Number	Range
15420	1 foot section
15421	2 foot section
15422	5 foot section

Style M

The Style M is a metric measurement staff gage that is 65 mm wide and is available in 1 meter sections. The Style M is divided into centimeters with each decimeter numbered. Separate figure plates (see below) can be fastened on a pier, wall or other surface next to the Style M staff gage to number any desired elevation.

Part Number	Range
15423	1 meter section

Figure Plates

Separate numerical figure plates are available in 2" x 3", 3" x 4" and 4" x 6" sizes. Figure plates are commonly used with Style E or Style M staff gages and are fastened to a pier or wall to mark custom elevations.

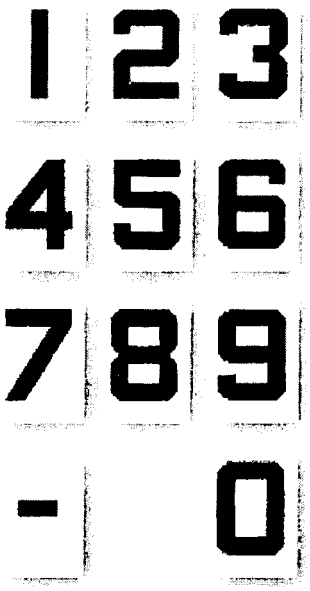


Figure Plate Number	Figure Plate Dimensions 2" x 3"	Figure Plate Dimensions 3" x 4"	Figure Plate Dimensions 4" x 6"
0	15424	90980	28134
1	15425	90981	28135
2	15426	90982	28136
3	15427	90983	28137
4	15428	90984	28138
5	15429	90985	28139
6 or 9	15430	90986	28140
7	15431	90987	28141
8	15432	90988	28142
Minus figure (-)	24187	-	-

Stevens®
Water Monitoring Systems, Inc.

Corporate Headquarters
12067 NE Glenn Widing Drive
Suite 106
Portland, Oregon 97220

800.452.5272 Tel
503.445.8000
503.445.8001 Fax
info@stevenswater.com
www.stevenswater.com

Since 1911, Stevens Water Monitoring Systems, Inc. has been a leading manufacturer of:

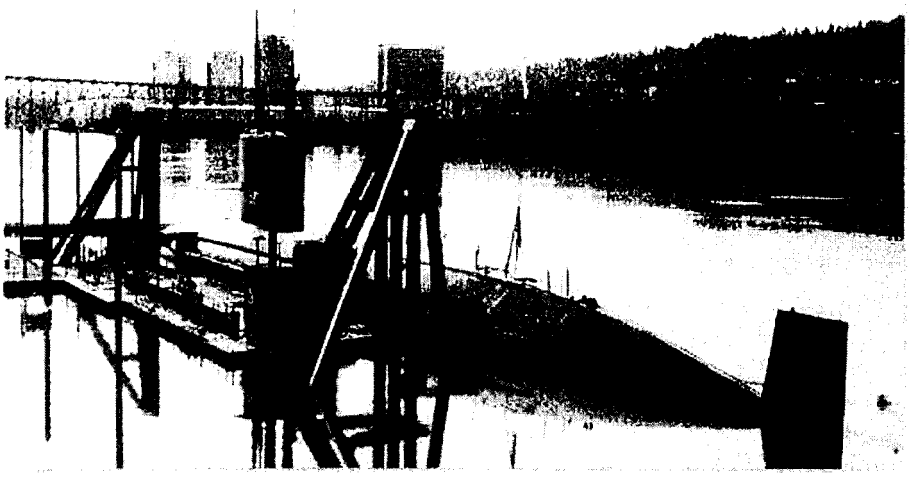
- Water Level Sensors
- Water Quality Sensors
- Soil Moisture Sensors
- Chart Recorders
- Staff Gages
- Telemetry Systems
- Data Collection Platforms

Porcelain Enameled Staff Gage DATA SHEET

Custom Staff Gages

Stevens is the leading provider of custom staff gages for unique applications. Staff gages can be designed for applications requiring large displays, flow measurement, slopes, or other unique mounting angles for easy visual measurements. Numbers, graduated markings, and colors used on the gage can also be customized to present a clear, visual measurement of water flow.

Contact Stevens today to discuss your custom staff gage requirements.



Custom Stevens staff gage mounted on a sloped pier on the Willamette River in Portland, Oregon. The submarine pictured is the USS *Blueback*.

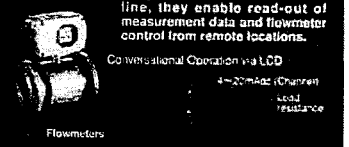
Intelligent Functions for Greater Ease of Operation

Multifunctional

A built-in microprocessor makes possible the numerous functions listed in the table of converter specifications. Though there are restrictions on the number of DI and DO points, the customer is free to choose from among numerous available functions.

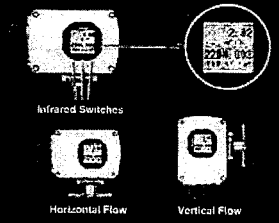
Communication Functions(HART Protocol)

"Smart" transmission functions employ multiplexing of analog flow rate signals (4 to 20 mA dc) and digital signals. Together with the "Dev Com2000 Smart Device Communicator" or the Communicator of third party connected to a 4 to 20 mA line, they enable read-out of measurement data and flowmeter control from remote locations.



Conversational Operation via LCD Display, or Enclosed Operation

Various flowmeter operations can be performed while viewing Full dot-matrix 128x128 LCD display.
In highly humid environments, the flowmeter can be operated without opening the converter cover (enclosed operation). (Standard on the LF620, LF622, LF232 & LF502)Also LF620 & LF622 converter LCD display allows the LCD to be rotated electronically to 90, 180 and 270 degrees.



HART protocol:Highway Addressable Remote Transducer is a Communications protocol for industrial sensors recommended by HCF(HART Communication Foundation)

● Converters

Model	LF620 (Integral type)	LF622 (Remote type)	LF541 (Integral type)	LF232 (Remote type)
Input	Digital Input: 1 (Note1)			Digital Input: 2 (option)
Output	Current output : 4-20mAdc Digital output : 1 transistor open-collector 1 solidstate relay contact (Note1, Note2)			Current output :4-20mAdc Digital output : 1 transistor open-collector 3 Solidstate relay contact (option)
Comm. functions	HART protocol, PROFIBUS Modbus		HART protocol PROFIBUS (option)	HART protocol
Other functions	Pulse output Multi-range selection output High, High high, Low and/or Low low alarm Empty Pipe Alarm (Note3) Preset count (Simple batch system configurable using DI, DO) Low cut Fixed-Values for current and pulse outputs Zero-span calibration Zero adjustment function			
Display	LCD display (back-light provided) Full dot matrix LCD			2-row LCD
Surge protection	Built in power supply, current signal output circuit, digital Input/Output circuit			
Power Supply	100-240Vac 50/60Hz, 110Vdc 24Vdc (option)		100-240Vac	100-240Vac (Note4) 24Vdc (Note5)
Structure	NEMA 4X (IP67) Watertight			NEMA 4 (IP67) Watertight
Hazardous location Certificate	cFMus Div.2			

Note1: DI, DO1, DO2 and HART cannot be used with Modbus communication.
Note2: Current output and HART cannot be used with PROFIBUS communication.
Note3: Not applicable to LF541
Note4: 100-120Vac in case of partially-filled type.
Note5: Applicable for meter size 1/10" to 18".

ISO9001 Certified

ISO14001 Certified

The works producing the flow meter is registered as an environmental management system factory specified by ISO14001

Safety Instructions

Misuse of product can result in property damage or human injury. Read related manuals carefully before using this product.

Specifications are March 2001 and subject to change without notice.
For further information, please contact your nearest "Toshiba Representative for International Operations-Produced Goods"

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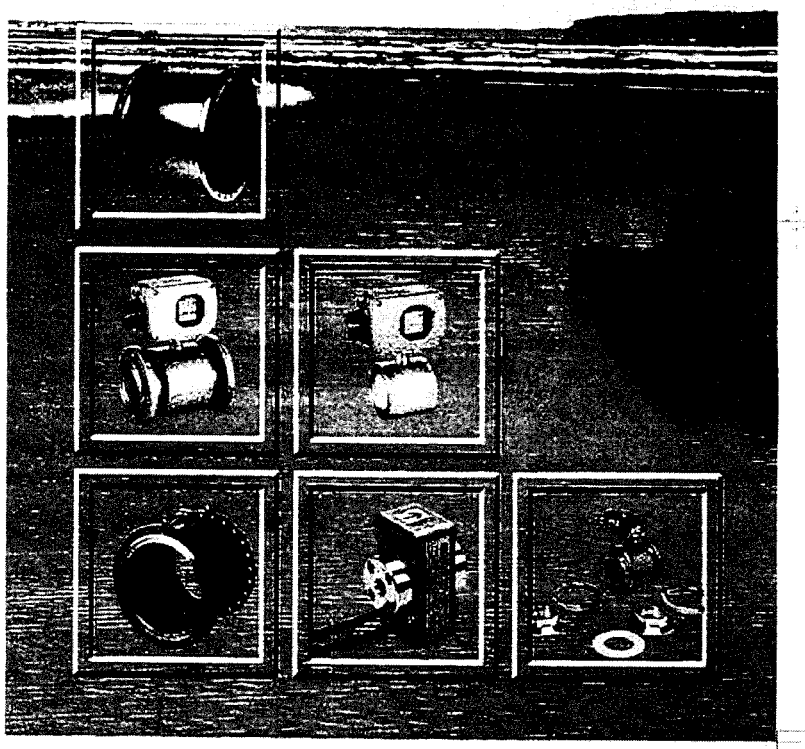
TOSHIBA
Leading Innovation >>>

TOSHIBA'S LINE-UP OF ELECTROMAGNETIC FLOWMETERS



TOSHIBA'S ELECTROMAGNETIC FLOWMETERS: INTELLIGENCE, HIGH QUALITY AND DURABILITY

Electromagnetic flowmeters are instruments for measuring the flow of conductive fluids, using Faraday's principle of electromagnetic induction. Toshiba has been marketing electromagnetic flowmeters since the late 1960's. Toshiba flowmeters, the result of a wealth of experience and considerable engineering expertise, have won acceptance in all areas of industry.

A full lineup of products covering diameters from 1/10" to 120" as well as various liner materials to accommodate diverse fluids are available, making possible fluid measurements in almost any imaginable application.

Main Applications

- Water and Waste
- Foods, Beverage and Pharmaceutical
- Steel, Nonferrous Metals
  Cooling water, Metals Processing,
  Stack gas desulfurization
- Fertilizers and Inorganic Chemicals
  Fertilizers, Soda, Aqueous acid solutions,
  Aqueous alkaline solutions
- Pulp and Paper
  Paper making processes, Pulp
- Polymer Chemicals
  Chemical fibers, *Water-soluble applications*,
  Water-soluble adhesives
- Liquids Containing Solid Matter
  Concrete slurries, Mortar, Slurries of solid matter

Toshiba Technology Meets Diverse Needs

- The divided multi-sampling system provides reliable and accurate measurement of a wide variety of fluids
- Unique noise suppression technology reduces chemical noise
- A high-purity alumina ceramic measurement tube eliminates potential problems in the measurement of fluids at elevated temperatures, corrosive chemicals, and fluids under other adverse conditions
- Toshiba's functional magnetic field distribution technique and the reduced number of flowmeter components result in improved flow measurement efficiency and reliability

Intelligent Functions for Industry Requirements

- LF620 and LF622 converters are available to select the communication from HART protocol, PROFIBUS and Modbus (RS485)
- User-friendly design satisfied the easy installation and operation
- LF620 and LF622 converters can open the cover from front to achieve easy wiring access
- LCD display rotates 90, 180 and 270 degrees to fit every installation condition (Available for LF620, LF622 and LF541)
- All the converters are equipped with infrared switch
  No need to open cover when setting

Enhanced Resistance to Harsh Environments

- Ceramic measurement tubes improve resilience
  The LF470, LF410 and LF511 detectors (1/10" to 4") employ an alumina ceramic measurement tube, for improved resistance to abrasion, pressure and temperature
- LF650 PFA liner enable the flowmeter to operate under the extreme ambient temperature -40°F. Also LF650 [illegible]

Full Product Lineup

Conventional Electromagnetic flowmeters
A complete lineup of [illegible] diameters ranging from 1/10" to 24" [illegible] accommodate diverse applications [illegible] flow to large flow measurements and [illegible] water flow to measurements of chemicals and solutions.

Capacitance type LF511/LF541
Toshiba's advanced capacitance technology achieves to electrode-less type of electromagnetic flowmeter at the wetting part inside detector pipe.

Electromagnetic Flowmeters for Sanitary Applications (LF490, LF511 sanitary 3A approved)
Model LF490 and LF511 sanitary are used for the measurement flow under sanitary conditions. The flowmeters are designed for handling of clean in place requirements with quick clamped components.

● Detectors

Models	GF630 Flanged	LF650 Flanged	LF430 Flanged	LF410 Water	LF490 Sanitary	LF470 Fractional	LF511 Capacitance	LF664 Flanged (large)	LF150 Flanged (large)	LF502 Partially-filled
Mounting style between converter	Integral type / Remote type					Remote type	Integral type	Integral type/Remote type	Remote type	Remote type
Meter size Unit: inch (mm)	1/2", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12", 14", 16", 18", 20", 24" (15 to 600mm)	1/2", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12", 14", 15", 18" (15 to 450mm)	1/2", 1", 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6", 8", 10", 12", 14", 15", 16", 20", 24" (15 to 600mm)	1/2", 1", 1-1/2", 2", 3", 4", 6", 8" (15, 25, 40, 50, 80, 100, 150, 200mm)	1", 1-1/2", 2", 3", 4" (25, 40, 50, 80, 100mm)	1/10", 1/6", 1/4" (2.5, 4, 6mm)	1", 1-1/2", 2", 3", 4" (25, 40, 50, 80, 100mm)	20", 24", 28", 32", 36", 40", 44", 48", 56", 64", 72", 78" (500 to 1,950mm)	80", 88", 96", 104", 112", 120" (2,000 to 3,000mm)	6", 8", 10", 12", 14", 16", 20", 24" (150, 200, 250, 300, 350, 400, 500, 600mm)
Measurement Range (Flow rate equivalent)	[0-1.0] - [0-32.8]ft/s (0-0.3m/s to 0-10m/s)						[0-1.64] - [0-32.8]ft/s (0-0.5m/s to 0-10m/s)	[0-1.0] - [0-32.8]ft/s (0-0.3m/s to 0-10m/s)		6": 0 - 264 GPM (std) to 0 - 1320 GPM 8": 0 - 484 GPM (std) to 0 - 2420 GPM 10": 0 - 770 GPM (std) to 0 - 3850 GPM 12": 0 - 1100 GPM (std) to 0 - 5500 GPM 14": 0 - 1540 GPM (std) to 0 - 7700 GPM 16": 0 - 1980 GPM (std) to 0 - 9900 GPM 20": 0 - 3124 GPM (std) to 0 - 15620 GPM 24": 0 - 4400 GPM (std) to 0 - 22000 GPM
Accuracy	• 1/2" to 18" (15mm to 450mm) : ±0.2% of Rate* * This pulse output error result is established under standard operating conditions at Toshiba's admitted flow calibration facility (NIST Traceable) * Individual meter measurement error may vary up to ±0.5% of Rate at 1.64 ft/s (0.5m/s) or more and ±0.3% of rate ±0.039 inch/s (1mm/s) at 1.64 ft/s or less. * Current output plus ±8μA (0.05% of span) * Refer to individual calibration data for each individual meter's measurement error • 20" and 24" (500mm and 600mm) : ±0.3% of Rate* * This pulse output error result is established under standard operating conditions at Toshiba's admitted flow calibration facility (NIST Traceable) * Individual meter measurement error may vary up to ±0.5% of Rate at 3.28 ft/s (1.0m/s) or more and ±0.3% of rate ±0.079 inch/s (2mm/s) at 3.28 ft/s (1.0m/s) or less * Current output, plus ±8μA (0.05% of span) * Refer to individual calibration data for each individual meter's measurement error					Measurement range: 3.3-32.8 ft/s (1.0-10m/s) Flow rate 50-100%: ±0.8% of rate Flow rate 0-50%: ±0.4% of FS Measurement range: 1.0-3.3 ft/s (0.3-1.0m/s) Flow rate 0-100%: ±0.8% of FS	Measurement range: 3.28-32.8 ft/s (1.0-10m/s) Flow rate 50-100%: ±0.5% of rate Flow rate 0-50%: ±0.25% of FS Measurement range: 1.64-3.28 ft/s (0.5-1.0m/s) Flow rate 0-100%: ±0.5% of FS	20"-24": Accuracy ±0.3% of Rate* • This output error result is established under standard operating conditions at Toshiba's admitted flow calibration facility (NIST Traceable) • Individual meter measurement error may vary up to ±0.5% of Rate at 3.28 ft/s (1.0m/s) or more and ±0.3% of Rate ±0.079 inch/s (2mm/s) at 3.28 ft/s (1.0m/s) or less • Current output plus ±8μA (0.05% of span) • Refer to individual calibration data for each individual meter's measurement error 28" to 120": Accuracy ±0.5% of Rate* • This pulse output error result is established under standard operating conditions at Toshiba's flow calibration facility, Fuchu Japan • Individual meter's measurement error may vary up to ±1.0% of Rate at 3.28 ft/s (1.0m/s) or more and ±0.4% of Rate ±0.157 inch/s (4mm/s) at 3.28 ft/s (1.0m/s) or less • Current output, plus ±8μA (0.05% of span) • Refer to individual calibration data for each individual meter's measurement error		±2%FS
Mounting style	Flange			Wafer	Sanitary clamp	Threaded	Water • Sanitary clamp	Flange		Flange
Lining material (Meter size)	FEP: 1/2" to 10" (15 - 250mm) PTFE: 12" to 24" (300 - 600mm) Polyurethane (*2): 1/2" to 16" (15 - 450mm)	PFA, Polyurethane (*2) Hard rubber (*2), 4" to 18" (100mm-450mm)	PFA: 1/2" to 16" (15-400mm) EPDM rubber: 3" to 18" (80-450mm) Hard rubber(*2), 4" to 24" (100mm-600mm)	ceramic (std.): 1/2" to 4" (15-100mm) PFA: 1/2" to 8" (15-200mm)	PFA	Alumina ceramic		Natural rubber Hard rubber (*2)	Chloroprene rubber	EPDM: 6" to 24" (150-600mm) PFA: 6" to 16" (150-400mm) Chloroprene: 20" & 24" (500 & 600mm)
Electrode material	PU, 316L stainless steel (std.) FEP,PTFE lining: Hastelloy C equivalent (*1)(std.)	Polyurethane, Hard rubber lining: 316L stainless steel (std.) PFA lining: Hastelloy C equivalent (*1)(std.)	PFA lining: Hastelloy C equivalent (*1)(std.) EPDM, Hard rubber lining: 316L stainless steel (std.)	ceramic Lining: 316L stainless steel (std.) PFA lining: Hastelloy C equivalent (*1)(std.)	316L stainless steel (std.)	Pt-Ir	Nothing at the wetting part	316L stainless steel (std.), others		316L stainless steel (std.)
Grounding ring material	PU, FEP: 316 stainless steel (opt.), others PTFE: 316 stainless steel (std.), others	PFA, Polyurethane, Hard rubber: 316 stainless steel (std.), others	PFA, EPDM, Hard rubber: 316 stainless steel (std.), others	ceramic, PFA: 316 stainless steel (std.), others		316 stainless steel, others	ceramic: 316 stainless steel, others	Hard rubber, Natural rubber: 316 stainless steel (opt), others	Chloroprene rubber: 304 stainless steel (std.), others	6" to 16" (150-400mm): 316 stainless steel (std.) 20" & 24" (500 & 600mm): 304 stainless steel (std.)
Detector body material	Carbon steel			1" to 4" (25-100mm): Stainless steel 1/2", 6", 8" (15, 150, 200mm): Carbon steel	Stainless steel	Aluminum alloy	Stainless steel	Carbon steel		Carbon steel
Structure	NEMA 4X (IP67) Watertight	NEMA 4X (IP67) Watertight NEMA 6P (IP68) Submersible (to depth of 15m)(opt.)	NEMA 4X (IP67) Watertight NEMA 6P (IP68) Submersible (to depth of 15m)(opt.)	NEMA 4X (IP67) Watertight		NEMA 4 (IP67) Watertight	NEMA 4X (IP67) Watertight	NEMA 4X (IP67) Watertight NEMA 6P (IP68) Submersible (to depth of 15m)(opt.)		NEMA 4X (IP67) Watertight NEMA 6P (IP68) Submersible (to depth of 15m)(opt.)
Compatible converters	LF620 (Combined type), LF622 (Separate type)					LF622 (separate type)	LF541	LF620 (combined type), LF622 (separate type)	LF232 AB (*5)	LF232 AF (*5)
Range of fluid levels	Fully-filled									1 - 1/4" (30mm) to fully-filled condition
Hazardous location Certificate	cFMus Div.2						cFMus Div.2	cFMus Div.2 (only for LF664)		

*1 Hastelloy C is a registered trademark of Haynes International Inc.
*2 NSF Approvals available
*3 316 Stainless steel Grounding ring is installed as standard for PTFE lining.
*4 Model LF664 is combined with LF620 or LF622 converter. Its meter size is from 20" to 78" (500 to 1950mm)
*5 cFMus Div.2 for LF232 is pending

Appendix I

TECHNICAL CAPABILITY

Arizona Water Company
Technical Capability

Raymond G. Murrieta, Arizona Water Company - Division Manager. More than 30 years of experience in operating and maintaining water treatment and distribution systems.

ADEQ Certified Water Treatment Operator, Grade 4 - No. 03555
ADEQ Certified Water Distribution Operator, Grade 4 - No. 03555

Fredrick K. Schneider, P.E., Arizona Water Company - Vice President - Engineering. 24 years of experience in designing and operating water and wastewater systems.

ADEQ Certified Water Treatment Operator, Grade 2 - No. 11557
ADEQ Certified Water Distribution Operator, Grade 3 - No. 11557
ADEQ Certified Wastewater Treatment Operator, Grade 2 - No. 11557
ADEQ Certified Wastewater Collection, Grade 3 - No. 11557

CLEAR CREEK ASSOCIATES

DONALD P. HANSON, R.G.

Title

Principal Hydrogeologist

Expertise

Hydrogeology, Groundwater Recharge, Water Resources

Academic Background

B.S., Geology/Hydrogeology, Northern Arizona University, 1984

Registration

Registered Geologist, 1992 - Arizona Registration No. 26036
Professional Geologist, 1998 - Wyoming Registration No. PG-2983

Experience

Don Hanson joined Clear Creek Associates in May 2000. He has 30 years of experience in developing water resources, conducting hydrogeologic investigations, siting and permitting for groundwater recharge, and aquifer storage and recovery (ASR) and public supply well design and installation. He currently manages multiple water resources and recharge projects, including the evaluation and rehabilitation of existing recharge facilities. He has worked with ADEQ and ADWR to successfully permit and re-permit numerous groundwater recharge facilities.

PRIOR TO JOINING CLEAR CREEK ASSOCIATES

Mr. Hanson was manager of the Phoenix office of Harding Lawson Associates, a national engineering and environmental consulting firm.

Representative Projects

REPRESENTATIVE PROJECTS INCLUDE:

City of Surprise – Manager for siting, design, installation and testing of five new vadose zone injection wells to recharge reclaimed water produced from the City's new SPA-2 reverse osmosis WRF. Project included development of O&M plans, operator training, and technical support for automated control logic development. Project also included APP and USF/WS permitting.

City of Glendale – Manager for siting and conceptual design of new recharge facilities to manage increased reclaimed water production from an expansion to the City's West Area WRF. Project included an evaluation of technologies from managed recharge to full ASR, a cost benefit analysis for siting, reclaimed water quality requirements, and groundwater modeling of the preferred sites.

City of Phoenix – Manager for the CCWRP vadose zone well evaluation project. The project included a determination of the causes leading to premature failure of seven vadose zone injection wells, development of remedies to rehabilitate existing wells, and development of a new VZ well design for future VZ wells at the site.

City of Phoenix – Manager for the NE Phoenix Aquifer recharge siting project. The intent of the project was to evaluate recharge technologies and locations for a future indirect potable reuse system that will recharge reclaimed water from the City's Cave Creek WRP with recovery for both potable and non-potable uses. The project included the development of several scenarios including managed recharge, VZ wells and ASR, extensive groundwater modeling and particle tracking, and life cycle cost analysis.

Vistancia, LLC. – Manager for the design, permitting (WS, USF & APP), and construction management of two vadose zone injection wells for reclaimed water from the City of Peoria's Jomax WRF. Project includes City/Agency meetings, a hydrologic study, AOI, DIA and mounding modeling to demonstrate hydrologic feasibility.

City of Scottsdale – Managed the design, drilling, construction, and testing of a new ASR well. This project also included the design and installation of two deep (1,000') groundwater monitoring wells as required to meet APP and USF permit requirements.

City of Peoria – Managed the evaluation of performance problems at two new recharge basins at the City's Beardsley Road WRF. The project included detailed hydrogeologic investigation, pilot testing of recommended solutions, implementation and construction management of full scale remedy, and oversight of final testing.

CLEAR CREEK ASSOCIATES

DONALD P. HANSON, R.G.

Town of Gilbert – Managed USF permitting at several new and existing vadose zone recharge facilities. Several sites had significant environmental issues associated with nearby documented groundwater contamination from chlorinated solvents. Developed agency approved monitoring and contingency plans.

City of Chandler - Managed the design and installation of 6 high capacity ASR wells for the Ocotillo Recharge and Recovery Project and 9 high capacity ASR wells at the Tumbleweed Recharge and Recovery site. Projects included well design, bidding services, WS, USF and APP permitting, installation and testing and O&M support.

Memberships

Arizona Water Association (AZ Water)
National Groundwater Association (NGWA)
American Institute of Professional Geologists (AIPG)

Publications/ Presentations

2013 - ***High Capacity Well Design.*** National Groundwater Association, 2013 Groundwater Expo – Nashville, TN, December.

2013 – ***Water Reuse – New Perspectives on Policy and Science.*** 2013 Annual AHS Symposium – Shifting Boundaries, Recalibrating the Hydrologic Approach, September.

2013 - ***Well Screen Rehabilitation.*** Groundwater Resources Association of California, High Resolution Tools and Techniques for Optimizing Groundwater Extraction for Water Supply Symposium, June.

2013 - ***Capitalizing on Well Capacity Analysis.*** 86th Annual AZ Water Conference, May.

2013 – ***Groundwater Recharge For The Future of Chile.*** Presented to the Chilean Government, Department of Agriculture, April.

2012 – ***Groundwater Recharge In Arizona.*** Presented to the Chilean Government, Department of Agriculture, December.

2012 - ***High Capacity Well Design.*** National Groundwater Association, 2012 Groundwater Expo – Las Vegas, NV, December.

2012 - ***117 Degrees in The Shade – Solutions to a Hot Water Supply Well.*** 28th Annual Tri-State Seminar-on-the-River, September.

2012 - ***Basin Recharge - Planning For Success.*** 85th Annual AZ Water Conference, May.

2012 - ***Well Evaluation Concepts and Techniques, Well Rehabilitation and Modification Methods.*** ADEQ Operator Certification Program Workshop, April.

2011 - ***Enhancing Basin Recharge.*** A presentation to the City of Pomona, California, October.

2011 - ***Aquifer Recharge-From Vision to Reality.*** 84th Annual AZ Water Conference, May.

2011 - ***Well Evaluation Concepts and Techniques, Well Rehabilitation and Modification Methods.*** ADEQ Operator Certification Program Workshop, February.

2010 - ***Groundwater Recharge – Tips for Siting, Design, and Operation.*** 26th Annual Tri-State Seminar-on-the-River, September.

2008 - ***Groundwater Recharge and its Impacts on Non-Point Source Nitrate Contamination.*** Peer reviewed article in The Professional Geologist, Volume 45, Number 4 August/September.

2006 - ***New Well Techniques for Well Installation.*** 22nd Annual Tri-State Seminar-on-the-River, September.

2006 - ***Developing a Wet Water Supply.*** A presentation to Pulte Homes of Arizona, March.

2005 - ***Is It a Pump or Well Problem.*** 21st Annual Tri-State Seminar-on-the-River, September

2005 - ***Maintaining ASR Well Efficiency.*** 12th Biennial Symposium on Groundwater Recharge, June.

2005 - ***Well Cleaning Eliminates Costly Arsenic Treatment.*** AWPCA 78 Annual Conference and Exposition, May.

2004 - ***The Data Game, How Much, What Kinds, and Why.*** 20th Annual Tri-State Seminar-on-the-River, September.

2004 - ***Chandler's Reclaimed Water Program Yields 30 MGD Water Supply***, Co-author, 19th Annual Water Reuse Symposium, September.

2003 – ***Groundwater Recharge And Its Impacts On Non-Point Source Nitrate Contamination***, 11th Biennial Symposium on Groundwater Recharge, June.

CLEAR CREEK ASSOCIATES

STEVEN W. CORELL, R.G.

Title

Senior Hydrogeologist

Expertise

Hydrogeology/Geology, Groundwater Modeling

Academic Background

B.A., Geology, State University of New York at Plattsburgh, 1981
NGWA - Short Course: Visual MODFLOW, Salem, Mass., 1998
U.S.G.S. Water Resources Division - Advanced Modeling of Groundwater Flow, National Training Center, Denver, Colorado, 1995
University of Arizona - Subsurface Hydrology, 1990
Arizona State University - Groundwater Hydrology, 1987

Registration

Registered Geologist: Arizona, No. 30999 (1997)

Experience

CLEAR CREEK ASSOCIATES, PHOENIX, ARIZONA; 1999 TO PRESENT

Steven is a Senior Hydrogeologist with 30 years of professional experience, including 23 years of groundwater experience in Arizona. Areas of specialization include Underground Storage Facility applications, Aquifer Protection Permit applications, Assured Water Supply applications, construction of groundwater flow models, evaluation of groundwater resources, and Geographic Information Systems (GIS). Representative projects include the following.

- **UNDERGROUND STORAGE FACILITY PERMITTING**
  - Salt River Project Granite Reef Underground Storage Project
  - City of Phoenix Well 300
  - City of Phoenix Well 299
  - Anthem at Merrill Ranch Water Reclamation Plant
  - City of Surprise – SPA2 Regional Water Reclamation Facility
  - Chandler Heights Recharge Project
  - Avondale Wetlands
  - City of Peoria Beardsley Road WWTP
  - City of Chandler Ocotillo Recharge and Recovery Facility
  - City of Chandler Tumbleweed Recharge Facility
  - Intel Recharge Facility
  - CAWCD Agua Fria Recharge Project
- **GROUNDWATER SUPPLY STUDIES**
  - American West Potash, Holbrook, Arizona, water supply study
  - Buena Vista Ranch, Analysis of Assured Water Supply
  - City of Cottonwood, Designation of Assured Water Supply
  - Arizona Water Company, Pinal AMA Physical Availability Demonstration
  - Cimmaron Development, Vekol Valley, Analysis of Assured Water Supply
  - Long Meadow Ranch, Williamson Valley, Analysis of Assured Water Supply
  - Global Water Company – Santa Cruz Water Company, Designation of Assured Water Supply
  - Swan Southlands Development – Tucson, Arizona, Analysis of Assured Water Supply
  - Broadstone Preserve – Mobile, Arizona, Analysis of Assured Water Supply
  - City of Chandler, Hydrologic Map Series
  - City of Mesa Well Siting and Hydrologic Impact Analysis
  - City of Peoria, Groundwater Resource Investigation

CLEAR CREEK ASSOCIATES

STEVEN W. CORELL, R.G.

- American Ranch – Prescott, Arizona, Analysis of Assured Water Supply
- Johnson Ranch – Queen Creek, Arizona, Assured Water Supply
- City of Nogales – Portrero Canyon, Assured Water Supply
- rizona Water Company - Apache Junction Service Area, Physical Availability Demonstration
- PG&E National Energy Group – groundwater model of Harquahala Valley for water supply analysis

- **AQUIFER PROTECTION PERMITTING**

  - Freeport McMoRan Twin Buttes Mine
  - Freeport McMoRan Sierrita Mine
  - City of Peoria Vistancia Recharge Facility
  - Copper Basin Water Reclamation Plant, Queen Creek, Arizona
  - Town of Gilbert, South Recharge Facility and Riparian Facility

Professional History

Hydrogeologist, Bookman-Edmonston Engineering, Inc., Phoenix, Arizona; 1999
Hydrogeologist, Hydrosystems, Inc., Tempe, Arizona; 1997 to 1998
Hydrologist, Arizona Department of Water Resources, Phoenix, Arizona; 1988 to 1996
Geologist, Envirogas Inc., Mayville, New York; 1982 to 1987
Hydrocarbon Well Analyst, Continental Labs, Inc., Denver, Colorado; 1981

Professional Awards

Governors Recognition Award - Salt River Groundwater Modeling Team, 1994

Publications

Corell, S.W., Putman, F.P., Lovvik, D., and Corkhill, E.F., 1996; A GroundwaterFlow Model of the Sierra Vista Subwatershed of the Upper San Pedro Basin - Southeastern Arizona, ADWR Modeling Report No. 10.

Corell, S.W., and Corkhill, E.F., 1994. A Regional Groundwater Flow Model of the Salt River Valley-Phase II, Phoenix AMA, Numerical Model, Calibration, & Recommendations. ADWR Modeling Report No. 8.

Corkhill, E.F., **Corell, S.W.**, Hill, B.M., and Carr, D.A., 1993. A Regional Groundwater Flow Model of the Salt River Valley - Phase I, Phoenix AMA, Hydrogeologic Framework and Basic Data Report. ADWR Modeling Report No.6.

Corell, S.W., 1992. Groundwater Flow and Contaminant Transport Model - Central Phoenix, Maricopa County, Arizona. ADWR Modeling Report No. 3.

Corell, S.W., Presentation 2002. "Expanded West Salt River Valley Groundwater Flow Model and its Application to the City of Peoria" – presented at the Arizona Hydrological Society's Symposium 2002.

Rob Buss, P.E.
Role: Carollo's Project Manager

Education:
BS Civil Engineering

Licenses:
Civil Engineer, AZ (14718)
Professional Engineer, NM (19168)

Years of Experience: 37 Years

Benefit to the Project:
Rob has a strong background in civil related infrastructure projects, from master planning of municipal water, wastewater, and reuse water systems to detailed design and construction of those systems. For this project, Rob brings his extensive knowledge of spreading basins recharge facility design to the team. He has current working relationships with Central Arizona Project (CAP) engineering and operations staff and his experience as the Project Manager for the CAP's Tonopah Desert Recharge Project (TDRP) is directly relevant to the Pinal Valley Recharge project since many of the project elements are the same. Rob also has a strong background in potable municipal well construction, equipping, and operations, therefore he brings insight into the details of the proposed recovery well and pipeline design and construction.

Responsibility:
Rob will provide his wealth of knowledge of detailed design of Recharge Facilities through many recharge projects experience. Rob is responsible for Carollo's portion of the work, and will review key work products to maintain project quality. He will maintain close contact with Clear Creek's project manager so that the work is carried out efficiently and meets CCA's expectations.

Relevant Project Experience:

- Project manager for the CAP Tonopah Desert Recharge Facility (TDRP).
- Project manager for the City of Chandler, Chandler Heights Recharge Project (CHRP).
- Project manager for the City of Chandler Alamosa Wells Equipping Project.
- Project manager for the City of Chandler Price Road Well Equipping Project.
- Project engineer for the Chandler/Intel Fab 12 Industrial Process WTF Recharge Well Design.
- Project manager / resident engineer for the Town of Gilbert Riparian Preserve at Water Ranch.
- Project manager for the Town of Gilbert South Recharge Site.
- Project manager for the Orange County Water District Imperial Headgates Rehabilitation.
- Project civil engineer for the Orange County Water District Weir Pond Rehabilitation Project.

Appendix J

FINANCIAL CAPABILITY LETTER

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HIGHWAY, PHOENIX, ARIZONA 85015-5351 • P.O. BOX 29006, PHOENIX, AZ 85038-9006
PHONE: (602) 240-6860 • FAX: (602) 240-6874 • TOLL FREE: (800) 533-6023 • www.azwater.com

December 17, 2014

Arizona Department of Water Resources
3550 North Central Avenue
Phoenix, AZ 85012

Re: Financial Capability Statement - Underground Storage Facility Permit

Dear Sir or Madam:

As part of Arizona Water Company's Pinal Valley Recharge Project and Underground Storage Facility we plan to construct five recharge basins as a means to recharge the underlying aquifer. The estimated construction cost of the five recharge basins is $4.8 million. The annual cost to operate and maintain the facility including the delivery cost of Central Arizona Project water is estimated to be $2.0 million. This letter certifies that Arizona Water Company has the financial capability to construct and operate the facility for the twenty (20) year permitting time frame.

If you have any questions, please contact me at 602-240-6860.

Very truly yours,

Joseph D. Harris
Vice President and Treasurer

jgb

E-MAIL: mail@azwater.com

N:\POLICIES MEMOS AND CORRESPONDENCE\CORRES\JDH\ADWR_UNDERGROUNDSTORAGEPERMIT_120914.DOCX
JDH:JGB| 12/17/2014 3:08 PM

Arizona Water Company

Pinal Valley Recharge Project

Engineer's Opinion of Construction Cost

carollo
Engineers...Working Wonders With Water®

December 3, 2014

Item No.	Description	Quantity	Unit	Price/Unit	$ Amount
1	Mob/Demob / Clearing & grubbing; site work	1	Lump Sum	$ 250,000	$ 250,000
2	Excavation of Basins & Haul off (60 Acres)	1	Lump Sum	$ 300,000	$ 800,000
3	Turnout at the CAP canal; coffer dam; meter vault	1	Lump Sum	$ 500,000	$ 500,000
4	Control Valve vaults, gauges, overflow conduits	1	Lump Sum	$ 150,000	$ 150,000
5	24-inch Raw Water Pipeline, valves and fittings	6,200	LF	$ 200	$ 1,240,000
6	Perimeter fencing (7-foot high) with access gates	8,000	LF	$ 12	$ 96,000
7	Drainage control, access roads & ABC	1	Lump Sum	$ 150,000	$ 150,000
8	Monitoring & Piezometer Wells - Solar powered	3	EA	$ 80,000	$ 240,000
9	Electrical & Instrumentation	1	Lump Sum	$ 100,000	$ 100,000
				TOTAL DIRECT COST	$ 3,526,000
				CONTINGENCY (20%)	$ 705,200
				CONTRACTOR OVERHEAD, PROFIT, AND RISK (12%)	$ 423,120
				SALES TAX (BASED ON 50% MATERIALS - 4%)	$ 70,520
				TOTAL OPINION OF PROBABLE CONSTRUCTION COST	**$ 4,725,000**

Arizona Water Company

Pinal Valley Recharge Project

Opinion of Probable Operations and Maintenance Costs

carollo
Engineers...Working Wonders With Water®

December 17, 2014

No.	Item Description	Maintenance Required	Estimated Cost per Year	
1	Trashrack	Cleaning debris/hauling off	$	8,880
2	Flow Meter	Calibration/repair	$	8,320
3	Isolation Valve(s)	Repair/adjustment	$	500
4	24-inch waterline	Inspection/cleaning	$	2,000
5	Valve Vaults	Inspection/adjustment/repair	$	8,320
6	Basins	Scarifying/weed removal/repair	$	27,840
7	Monitoring wells	Adjustment/repair	$	8,320
		OPINION OF PROBABLE O&M ANNUAL COST	$	64,180

Assumptions:

1 Requires one person and service truck - hauling directly to landfill
8 hrs x 12 days/year x $80/hr = $7,680; Tipping fee = $100 x 12 = $1,200; Total = $8,880

2 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $5,200; Total = $8,320

3 Requires one person and service truck
Same as Item 2, except done concurrently.
Assume annual repair : LS = $500

4 Requires Contract Company to CCTV - once every 5 years
Cost to CCTV $10,000/5 = $2,000 per year

5 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $8,320; Total = $8,320
Assume this is done by same person on same day as Items 2 & 3 above.
Makes for longer day, therefore, this cost is ADDED to the O&M total.

6 Requires three people, service truck, dozer, and dump truck - hauling directly to landfill
24 hrs x 12 days/year x $80/hr = $23,040; Tipping fee = $100 x 12 = $1,200; Total = $24,240
Dozer and dump truck costs (assume AWC owns both) $300/day x 12 = $3,600

7 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $8,320; Total = $8,320
Assume this is done by same person on same day as Items 2 & 3 above.
Makes for longer day, therefore, this cost is ADDED to the O&M total.

Appendix K

TITLE DOCUMENTS & STATE LAND LEASE

STATE LAND DEPARTMENT
STATE OF ARIZONA

Right of Way

R/W No. 14-108857

THIS RIGHT OF WAY ("Right of Way") is entered into by and between the State of Arizona (as "Grantor") by and through the Arizona State Land Department and

ARIZONA WATER COMPANY

("Grantee"). In consideration of payment and performance by the parties of each of the provisions set forth herein, the parties agree as follows:

EXTENT OF DOCUMENT

"Additional Conditions", "Exhibits", and "Appendixes" are an integral part of this document. In case of a conflict between the printed boiler document and the additional conditions, exhibits, or appendixes, the applicable additional condition, exhibit, or appendix shall be considered the governing document and supersede the printed boiler, but only to the extent necessary to implement the additional condition, exhibit, or appendix, and only if the additional condition, exhibit, or appendix does not conflict with governing state or federal law.

ARTICLE 1
SUBJECT LAND

1.1 Grantor grants to Grantee a Right of Way on, over, through, and across the State lands described in Appendix A attached hereto ("Subject Land").

1.2 Grantee makes use of the Subject Land "as is", and Grantor makes no express or implied warranties as to the physical condition of the Subject Land.

ARTICLE 2
TERM

2.1 The term of this Right of Way commences on December 11, 2009 ("Commencement Date"), and expires on December 10, 2059 ("Expiration Date"), unless sooner canceled or terminated as provided herein or as provided by law.

20.12

ARTICLE 3
RENT

3.1 Base Rent shall be payable in advance every 25 years for the above mentioned term in such amount as determined to be due on the basis of appraisals made by the Commissioner.

3.2 If the Grantee should fail to pay rental when due, or fail to keep the covenants and agreements herein set forth, the Commissioner, at his option, may cancel said Right of Way or declare the same forfeited in the manner provided by law.

3.3 There shall be added to the delinquent rental or other monies due, a penalty and delinquent interest. The delinquent interest rate shall be set by the State Treasurer according to law. The penalty shall be the greater of a minimum processing cost as determined by the Commissioner or five (5%) percent. The delinquent rent, penalty and interest shall be a lien on the improvements and property on the land.

ARTICLE 4
PURPOSE AND USE OF SUBJECT LAND

4.1 The purpose of this Right of Way is the location, construction, operation, and maintenance of:

An underground 24 inch water transmission pipeline

4.2 No material may be removed by Grantee or its contractors without the written approval of the Grantor.

4.3 Grantee shall not exclude from use the State of Arizona, its lessees, or grantees, or the general public the right of ingress and egress over this Right of Way.

4.4 Grantee shall acquire required permits prior to construction, and adhere to all applicable rules, regulations, ordinances, and building codes as promulgated by the local jurisdiction and any applicable State or Federal agencies.

4.5 All use of State land outside the Right of Way must be applied for and authorized in accordance with applicable law.

4.6 Grantee shall not sublet or assign this Right of Way or any portion thereof without the written consent of the Grantor.

4.7 The Grantor retains ownership of the Subject Land. The use of this Right of Way is to be non-exclusive. This Right of Way is sold subject to existing reservations, easements, or rights of way heretofore legally obtained and now in full force and effect.

4.8 When necessary for Grantee's reasonable use of this Right of Way for the purposes for which the grant is made, it shall be deemed to include the rights in, upon,

over, and across the described Subject Land to erect, construct, reconstruct, replace, repair, and maintain the facilities authorized by this Right of Way.

4.9 Grantee shall have the right to erect, maintain, and use gates in all fences under the control of the Grantor which now cross or shall hereafter cross said Right of Way, and to trim, cut, and clear away trees or brush whenever in its judgment the same shall be necessary for the convenient and safe exercise of the right herein provided.

4.10 Grantee shall not fence any portion of this Right of Way unless specifically authorized in the attached additional conditions without prior written consent of Grantor, nor shall Grantee exclude from the use of the surface thereof the State of Arizona or its lessees or grantees as reserved in Paragraph 10.1.

ARTICLE 5
CONFORMITY TO LAW

5.1 This Right of Way is subject to applicable laws and covenants relating to State lands.

ARTICLE 6
CANCELLATION, TERMINATION AND ABANDONMENT

6.1 This Right of Way is subject to cancellation pursuant to A.R.S. § 38-511.

6.2 If at any time the Right of Way ceases to be used for the purpose for which it was granted, it shall become void, and the right to use the Subject Land and all the rights of Grantee hereunder shall revert to the Grantor.

6.3 Upon revocation or termination of the Right of Way, the Grantee shall remove all equipment or facilities, and so far as is reasonably possible, restore and/or rehabilitate the Subject Land to its original condition, and to the satisfaction of the Grantor.

ARTICLE 7
ENVIRONMENTAL INDEMNITY

7.1 Grantee shall protect, defend, indemnify, and hold harmless the Grantor from and against all liabilities, costs, charges, and expenses, including attorneys' fees and court costs arising out of (or related to) the presence of (or existence of) any substance regulated under any applicable federal, state, or local environmental laws, regulations, ordinances, or amendments thereto because of: (a) any substance that came to be located on the Right of Way due to Grantee's use or occupancy of the lands by the Grantee before or after the issuance of the Right of Way; or (b) any release, threatened release, or escape of any substance in, on, under, or from the Right of Way that is caused, in whole or in part, by any conduct, actions, or negligence of the Grantee, regardless of when such substance came to be located on the Right of Way.

shall notify the Grantor and the Arizona Department of Agriculture 30 days prior to any destruction or removal of native plants to allow salvage of those plants where possible.

12.3 Prior to surface disturbance, the Grantee hereof shall provide evidence of archaeological clearance to the Department. Archaeological surveys and site mitigation must be conducted in accordance with rules and regulations promulgated by the Director, Arizona State Museum. In the event additional archaeological resources are detected by Grantee after receipt of archaeological clearance, all work shall cease and notification shall be given to the Director, Arizona State Museum, and Grantor.

ARTICLE 13
GRANTEE SHALL PROTECT AND RESTORE THE SUBJECT LAND

13.1 Grantee shall be required, upon completion of Right of Way construction, to make such rehabilitation measures on the State lands, including but not limited to restoration of the surface, revegetation, and fencing as determined necessary by the Grantor.

13.2 Grantee shall conduct all construction and maintenance activities in a manner that will minimize disturbance to all land values including but not limited to vegetation, drainage channels, and streambanks. Construction methods shall be designed to prevent degradation of soil conditions in areas where such degradation would result in detrimental erosion or subsidence. Grantee shall take such other soil and resource conservation and protection measures on the Subject Land under grant as determined necessary by the Grantor.

13.3 Costs incurred by the Grantee in complying with restoration and rehabilitation requirements, as determined by the Department, on State lands shall be borne by the Grantee.

13.4 Grantee shall conduct its operations on the Subject Land in such a manner as is consistent with good environmental practices. Grantee shall exert reasonable efforts to avoid damage of protected flora, and restore the surface to its condition prior to the occupancy thereof by Grantee.

ARTICLE 14
MISCELLANEOUS

14.1 The described Subject Land shall be used only for the purpose stated in Paragraph 4.1, and as may be further detailed elsewhere.

14.2 This Document is submitted for examination and shall have no binding effect on the parties unless and until executed by the Grantor (after execution by the Grantee), and until a fully executed copy is delivered to the Grantee.

shall notify the Grantor and the Arizona Department of Agriculture 30 days prior to any destruction or removal of native plants to allow salvage of those plants where possible.

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14.1 The described Subject Land shall be used only for the purpose stated in Paragraph 4.1, and as may be further detailed elsewhere.

14.2 This Document is submitted for examination and shall have no binding effect on the parties unless and until executed by the Grantor (after execution by the Grantee), and until a fully executed copy is delivered to the Grantee.

14.3 In the event of a dispute between the parties to this Right of Way, it is agreed to use arbitration to resolve the dispute, but only to the extent required by A.R.S. § 12-1518. In no event shall arbitration be employed to resolve a dispute which is otherwise subject to administrative review by the Department.

14.4 The Grantor does not represent or warrant that access exists over other State lands which intervene respectively between the above Right of Way and the nearest public roadway.

14.5 Grantee agrees to indemnify, hold, and save Grantor harmless against all loss, damage, liability, expense, costs, and charges incident to or resulting in any way from any injuries to person or damage to property caused by or resulting from the use, condition, or occupation of the Subject Land.

14.6 If for any reason the State of Arizona does not have title to any of the Subject Land described herein, this Right of Way shall be null and void insofar as it relates to the land to which the State has failed to receive title.

14.7 Every obligation of the State under this Right of Way is conditioned upon the availability of funds appropriated or allocated for the payment of such obligation. If funds are not allocated and available for the continuance of this Right of Way, this Right of Way may be terminated by the State at the end of the period for which funds are available. No liability shall accrue to the State in the event this provision is exercised, and the State shall not be obligated or liable for any future payments or any damages as a result of termination under this paragraph.

14.8 The parties agree to be bound by applicable State and Federal rules governing Equal Employment Opportunity, Non-discrimination and Disabilities, including Executive Order No. 99-4.

14.9 Within 30 days of project completion, Grantee shall submit a completed certificate of construction (copy attached).

ADDITIONAL CONDITIONS
#14-108857

1. The legal description of this right-of-way is detailed in EXHIBIT A attached. Subject to the Grantor's rules and policies then in place, and as a result of construction-related restrictions, Grantor and Grantee may agree to modify the legal description via the Grantee submitting "as built" or "proposed realignment" legals, depending on the situation, to the Grantor for the Grantor's review. If approved by the Grantor, and additional acreage is impacted, Grantee agrees to pay an appraised or pro-rated charge as the Grantor determines is appropriate. No refund will be made for a reduction in acreage.

2. All rock brought to the surface along with topsoil and overburden from the affected State Trust lands shall be salvaged and stockpiled separately in a manner that replacement shall utilize one hundred (100%) percent of the materials upon project completion. Excess rock unsuitable for scattering shall be disposed of in a manner and location that is authorized by the Grantor.

3. All equipment shall be removed from the site within seven (7) days of project completion.

4. In the event the Grantor determines that the affected State Trust lands have not been restored and/or rehabilitated to the satisfaction of the Grantor, or the surrounding State Trust lands have been adversely affected, Grantee shall amend this right-of-way to include the affected State Trust lands, and remit compensation to the Grantor in an amount representing the greater of actual damages or three (3) times the contract rent within (30) days.

5. Grantee shall maintain the easement area in the manner described above during the term of this easement. Grantee agrees to complete any necessary restoration and rehabilitation to the satisfaction of the Grantor within ninety (90) days of written notification of non-compliance.

20.12

ADDITIONAL CONDITION
FOR THREATENED/ENDANGERED SPECIES
#14-108857

The Arizona Game & Fish Department's Heritage Data Management System has been accessed, and current records show that the species listed below has/have been documented as occurring in the project vicinity.

Common Name	Scientific Name	Status
Yuma Clapper Rail	Rallus longirostris yumanensis	Listed Endangered

The Arizona Game & Fish Department recommends that you contact the U.S. Fish & Wildlife Service for additional information regarding the Endangered Species Act and how it applies to the species noted above.

EXHIBIT A
#14-108857
Page 3 of 6.

Legal Description

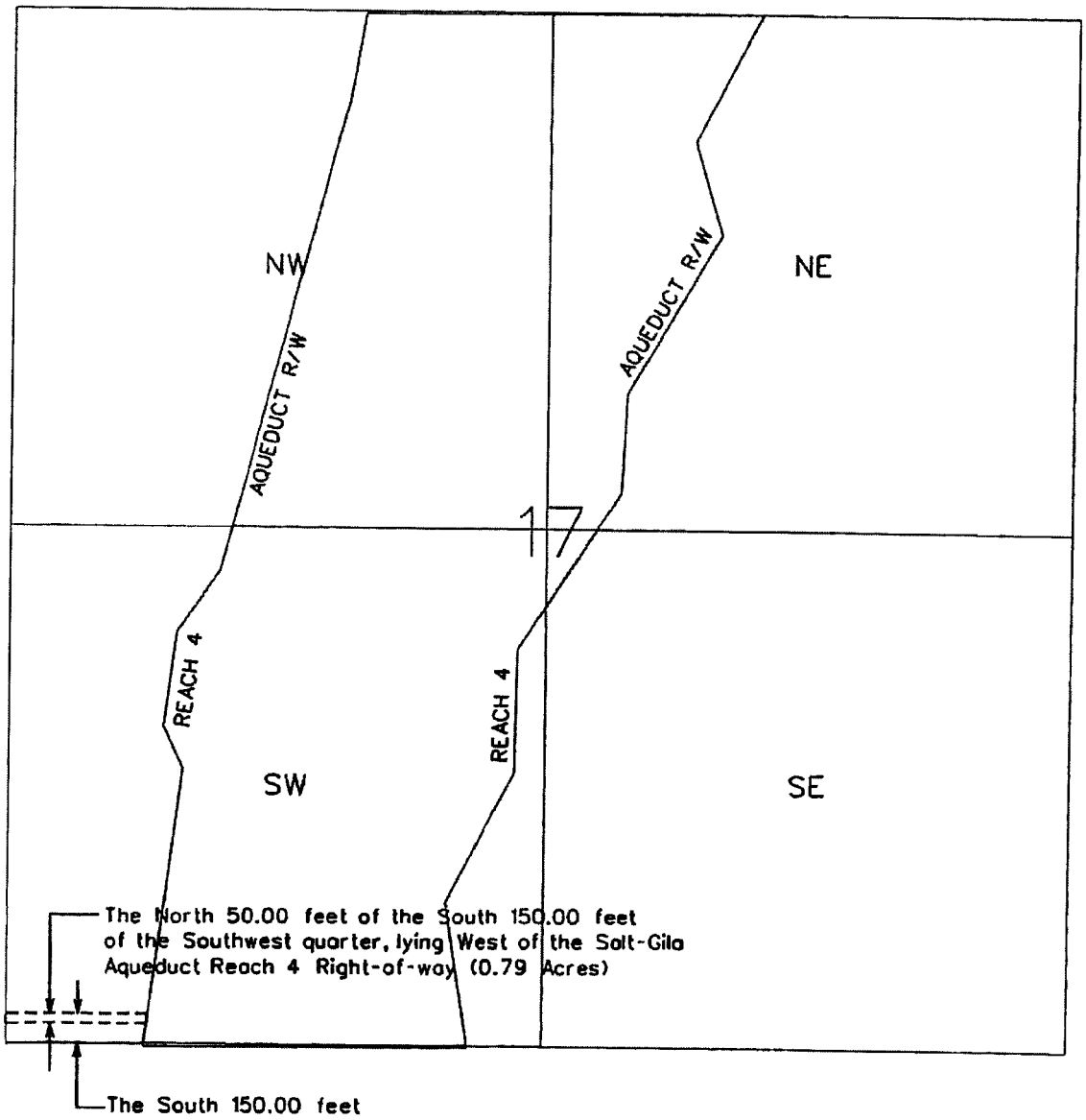
The North 50.00 feet of the South 150.00 feet of the Southwest quarter of Section 17, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, lying West of the West right-of-way line of the Salt-Gila Aqueduct Reach 4, according to the records of the Arizona State land Department in right-of-way file 93-85542. (0.79 Acres)

EXHIBIT A
#14-108857
Page 4 of 6.

SEC. 17 TWP. 6S. RGE. 9E.

N

ARIZONA STATE LAND DEPT.
0.79 Acre
Revised 01.05.09 CB
1"=800'



20.12

Legal Description

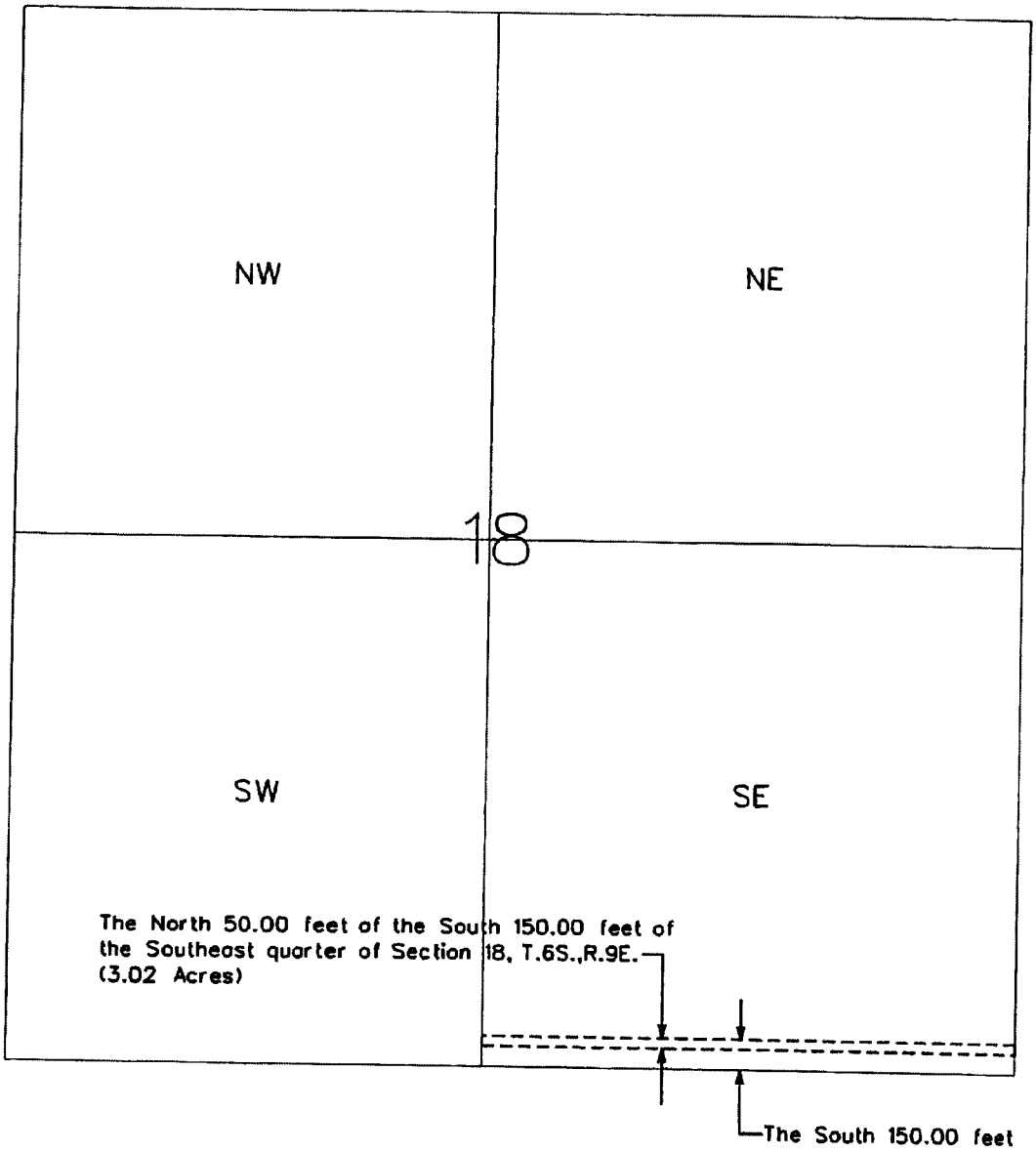
The North 50.00 feet of the South 150.00 feet of the Southeast quarter of Section 18, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona. (3.02 Acres)

EXHIBIT A
#14-108857
Page 6 of 6.

SEC. 18 TWP. 6S. RGE. 9E.

N

ARIZONA STATE LAND DEPT.
3.02 Acres
Revised 01.05.09 CB
1"=800'



20.12

GRANTEE'S CERTIFICATE OF CONSTRUCTION

RIGHT OF WAY NUMBER: _____

NAME OF GRANTEE: _____

DATE ISSUED: _____

PERMITTED USE: _____

LAND DEPARTMENT ADMINISTRATOR: _____

DATE CONSTRUCTION STARTED: _____

DATE CONSTRUCTION COMPLETED: _____

I hereby certify that the facilities authorized by the State Land Commissioner, were actually constructed and tested in accordance with the terms of the grant, in compliance with any required plans and specifications, and applicable Federal and State laws and regulations.

_____

Grantee's Signature **Date**

_____

Title

Return To: **Arizona State Land Department**
R/W Section
1616 W. Adams Street
Phoenix, AZ 85007

STANDARD R/W 12/05 Rev. 9/09

20.12

Vendor ID	Name	Payment Number	Check Date	Check Number
ARIZO007	STATE OF ARIZONA	50016716	3/30/2010	028555

Your Document Number	Date	Amount	Amount Paid	Discount	Net Amount Paid
128980	3/4/2010	$18,883.00	$18,883.00	$0.00	$18,883.00

$18,883.00 $18,883.00 $0.00 $18,883.00

LEFT AND RIGHT CHECK BORDERS ARE MICROPRINTING. VIEW UNDER MAGNIFICATION TO VERIFY AUTHENTICITY.

ARIZONA WATER COMPANY

GENERAL ACCOUNT

3805 N. BLACK CANYON HIGHWAY
POST OFFICE BOX 29006
PHOENIX, ARIZONA 85038-9006

028555 91-170/1221

Date
3/30/2010

Check Amount
$18,883.00

Eighteen Thousand Eight Hundred Eighty Three Dollars and 00 Cents

Pay to the Order of:

STATE OF ARIZONA
STATE LAND DEPARTMENT
1616 WEST ADAMS
PHOENIX AZ 85007

R. W. Geake
Jackie R. Craig

THE BACK OF THIS CHECK CONTAINS WATERMARK. HOLD AT ANGLE TO VERIFY AUTHENTICITY.

⑈028555⑈ ⑆122101706⑆ 001⑈168104⑈

20.12

Recorded at the request of ***Capital Title Agency Inc.***
when recorded mail to

Arizona Water Company

OFFICIAL RECORDS OF PINAL COUNTY RECORDER LAURA DEAN-LYTLE

DATE/TIME: 01/13/05 1647
FEE: $16.00
PAGES: 4
FEE NUMBER: 2005-004484

(4) W/C

Special Warranty Deed

Escrow No. 1042105B

For the consideration of Ten Dollars, and other valuable considerations, I or we, **Boa Sorte Steele & Fast Tract, LLC, an Arizona Limited Liability Company as to an undivided 50% interest and Langley Desert View, L.L.C., an Arizona limited liability company as to an undivided 50% interest**, do/does hereby convey to **Arizona Water Company, an Arizona corporation**, the following real property situated in **Pinal**, County, Arizona:

See Exhibit A attached hereto and made a part hereof.

SUBJECT TO: all matters of record, all matters that an accurate survey or inspection would reveal, and any and all other matters of which Buyer or its officers and employees have actual knowledge.

And the Grantor hereby binds itself and its successors to warrant and defend the title, against all acts of the Grantor herein, and no other, subject to the matters set forth.

Dated this **10th** day of **January** , 2005

Boa Sorte Steele & Fast Tract LLC
By: Boa Sorte Limited Partnership, sole member
By: Boa Sorte LLC, general partner

By: Wilford R. Cardon, Manager

Langley Desert View, L.L.C.

By: Steven G. Rees, Manager

STATE OF [ARIZONA] }ss:
COUNTY OF Maricopa

This instrument was acknowledged before me this 12 day of January, 2005 by Wilford R. Cardon, Manager of Boa Sorte LLC, General Partner of Boa Sorte Limited Partnership, sole member of Boa Sorte Steele & Fast Tract, LLC

My Commission Expires: _____

Notary Public

"OFFICIAL SEAL"
Jonathan Bjork
Notary Public-Arizona
Maricopa County
My Commission Expires 8/24/2007

2012

Recorded at the request of ***Capital Title Agency Inc.***
when recorded mail to

Arizona Water Company

Special Warranty Deed

Escrow No. 1042105B

For the consideration of Ten Dollars, and other valuable considerations, I or we, **Boa Sorte Steele & Fast Tract, LLC, an Arizona Limited Liability Company as to an undivided 50% interest and Langley Desert View, L.L.C., an Arizona limited liability company as to an undivided 50% interest**, do/does hereby convey to **Arizona Water Company, an Arizona corporation**, the following real property situated in **Pinal**, County, Arizona:

See Exhibit A attached hereto and made a part hereof.

SUBJECT TO: all matters of record, all matters that an accurate survey or inspection would reveal, and any and all other matters of which Buyer or its officers and employees have actual knowledge.

And the Grantor hereby binds itself and its successors to warrant and defend the title, against all acts of the Grantor herein, and no other, subject to the matters set forth.

Dated this **10th** day of **January** , 2005

Boa Sorte Steele & Fast Tract LLC
By: Boa Sorte Limited Partnership, sole member
By: Boa Sorte LLC, general partner

_____
By: Wilford R. Cardon, Manager

Langley Desert View, L.L.C.

Steven G. Rees
By: Steven G. Rees, Manager

STATE OF [ARIZONA] }ss:
COUNTY OF Maricopa

This instrument was acknowledged before me this __ day of January, 2005 by Wilford R. Cardon, Manager of Boa Sorte LLC, General Partner of Boa Sorte Limited Partnership, sole member of Boa Sorte Steele & Fast Tract, LLC

My Commission Expires: _____

_____
Notary Public

20.12

STATE OF [ARIZONA] }ss:
COUNTY OF Maricopa

This instrument was acknowledged before me this 12th day of January, 2005 by Steven G. Rees, Manager of Langley Desert View, L.L.C.

My Commission Expires: April 21, 2008

LINDA R. SIEGFRIED
Notary Public - Arizona
Maricopa County
My Commission Expires
April 21, 2008

20.12

Exhibit A

That portion of the East half of the West half of Section 18, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona lying East of the New Florence-Casa Grande Canal;

EXCEPTING THEREROM 50% of all oil and mineral rights, as reserved in instrument recorded in Docket 723, Page 735, Pinal County Records.

20.12

A-3 Engineer's Opinion of Probable Construction Cost

Arizona Water Company
Pinal Valley Recharge Project
Engineer's Opinion of Construction Cost

carollo
Engineers...Working Wonders With Water®

PHASED CONSTRUCTION OF PROJECT

March 20, 2015

PHASE 1 - RECHARGE BASIN, TURNOUT AND PIPELINE

Item No	Description	Quantity	Unit	Price/Unit	$ Amount
1	Mob/Demob / Clearing & grubbing; site work	1	Lump Sum	$ 100,000	$ 100,000
2	Excavation of Basin 1 & Haul off (10 Acres)	10	AC	$ 24,000	$ 240,000
3	Turnout at the CAP canal; coffer dam; meter vault	1	Lump Sum	$ 500,000	$ 500,000
4	Control Valve vaults, gauges, overflow conduits	1	EA	$ 30,000	$ 30,000
5	24-inch Raw Water Pipeline, valves and fittings	3,800	LF	$ 200	$ 760,000
6	Perimeter fencing (7-foot high) with access gates	3,500	LF	$ 12	$ 42,000
7	Drainage control, access roads & ABC	1	Lump Sum	$ 75,000	$ 75,000
8	Monitoring & Piezometer Wells - Solar powered	3	EA	$ 80,000	$ 240,000
9	Electrical & Instrumentation	1	Lump Sum	$ 60,000	$ 60,000
				TOTAL DIRECT COST	$ 2,047,000
				CONTINGENCY (20%)	$ 409,400
				CONTRACTOR OVERHEAD, PROFIT, AND RISK (12%)	$ 245,640
				SALES TAX (BASED ON 50% MATERIALS - 4%)	$ 40,940
				TOTAL OPINION OF PROBABLE CONSTRUCTION COST - PHASE 1	**$ 2,743,000**

Arizona Water Company
Pinal Valley Recharge Project
Engineer's Opinion of Construction Cost

carollo
Engineers...Working Wonders With Water®

PHASED CONSTRUCTION OF PROJECT

March 20, 2015

PHASE 2 THRU 5 - RECHARGE BASIN AND PIPELINE EXTENSION

Item No	Description	Quantity	Unit	Price/Unit	$ Amount
1	Mob/Demob / Clearing & grubbing; site work	1	Lump Sum	$ 100,000	$ 100,000
2	Excavation of Basin 2 & Haul off (10 Acres)	10	AC	$ 24,000	$ 240,000
4	Control Valve vaults, gauges, overflow conduits	1	EA	$ 30,000	$ 30,000
5	24-inch Raw Water Pipeline, valves and fittings	600	LF	$ 200	$ 120,000
6	Perimeter fencing (7-foot high) with access gates	1,125	LF	$ 12	$ 13,500
7	Drainage control, access roads & ABC	1	Lump Sum	$ 20,000	$ 20,000
9	Electrical & Instrumentation	1	Lump Sum	$ 10,000	$ 10,000
				TOTAL DIRECT COST	$ 533,500
				ESCALATION (3% per year)	$ 16,005
				CONTINGENCY (20%)	$ 106,700
				CONTRACTOR OVERHEAD, PROFIT, AND RISK (12%)	$ 64,020
				SALES TAX (BASED ON 50% MATERIALS - 4%)	$ 10,670
					$ 730,895
				TOTAL OPINION OF PROBABLE CONSTRUCTION COST	**$ 731,000**

PHASED CONSTRUCTION OF RECHARGE BASINS CONSTRUCTION COSTS (Assume ONE Phase per year)

Phase			
1	RECHARGE BASIN 1, TURNOUT AND PIPELINE	$	2,743,000
2	RECHARGE BASIN 2, AND PIPELINE EXTENSION	$	731,000
3	RECHARGE BASIN 3, AND PIPELINE EXTENSION	$	747,000
4	RECHARGE BASIN 4, AND PIPELINE EXTENSION	$	763,000
5	RECHARGE BASIN 5, AND PIPELINE EXTENSION	$	779,000

PROJECT GRAND TOTAL $ 5,763,000

A-4 Opinion of Probable Operations and Maintenance Costs

Arizona Water Company

Pinal Valley Recharge Project

Opinion of Probable Operations and Maintenance Costs

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Engineers...Working Wonders With Water®

December 17, 2014

No.	Item Description	Maintenance Required	Estimated Cost per Year	
1	Trashrack	Cleaning debris/hauling off	$	8,880
2	Flow Meter	Calibration/repair	$	8,320
3	Isolation Valve(s)	Repair/adjustment	$	500
4	24-inch waterline	Inspection/cleaning	$	2,000
5	Valve Vaults	Inspection/adjustment/repair	$	8,320
6	Basins	Scarifying/weed removal/repair	$	27,840
7	Monitoring wells	Adjustment/repair	$	8,320
		OPINION OF PROBABLE O&M ANNUAL COST	$	64,180

Assumptions:

1 Requires one person and service truck - hauling directly to landfill
8 hrs x 12 days/year x $80/hr = $7,680; Tipping fee = $100 x 12 = $1,200; Total = $8,880

2 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $5,200; Total = $8,320

3 Requires one person and service truck
Same as Item 2, except done concurrently.
Assume annual repair : LS = $500

4 Requires Contract Company to CCTV - once every 5 years
Cost to CCTV $10,000/5 = $2,000 per year

5 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $8,320; Total = $8,320
Assume this is done by same person on same day as Items 2 & 3 above.
Makes for longer day, therefore, this cost is ADDED to the O&M total.

6 Requires three people, service truck, dozer, and dump truck - hauling directly to landfill
24 hrs x 12 days/year x $80/hr = $23,040; Tipping fee = $100 x 12 = $1,200; Total = $24,240
Dozer and dump truck costs (assume AWC owns both) $300/day x 12 = $3,600

7 Requires one person and service truck
2 hrs x 52 days/year x $80/hr = $8,320; Total = $8,320
Assume this is done by same person on same day as Items 2 & 3 above.
Makes for longer day, therefore, this cost is ADDED to the O&M total.

A-5 Pinal Valley Recharge and Recovery Facility Cost Savings Over Surface Water Treatment Plant

Arizona Water Company
Comparison of Cost and Revenue Requirement
Pinal Valley Recharge and Recovery Project Over Surface Water Treatment Facility

	Surface Water Treatment Plant	Pinal Valley Recharge and Recovery Facility
Utility Plant in Service:		
Wells	$ 4,673,663	$ 0
Pumping and Treatment Structures and Equipment	31,679,449	0
Treatment Equipment	26,746,817	3,935,000
Storage Tanks	5,635,020	0
Booster Stations	3,781,053	0
Transmission and Distribution Mains	21,823,270	1,828,000
Total Utility Plant	$ 94,339,272	$ 5,763,000
Accumulated Depreciation	3,499,660	145,262
Net Utility Plant	$ 90,839,612	$ 5,617,738
Contributions in Aid of Construction	5,462,000	5,462,000
Amortization of CIAC	109,240	109,240
Contributions Net of Amortization	$ 5,352,760	$ 5,352,760
Deferred Taxes	95,869	29,840
Rate Base	$ 85,390,983	$ 235,138
Return on Rate Base	8.44%	8.44%
Operating Income Required	$ 7,206,999	$ 19,846
Gross Revenue Conversion Factor	1.65757	1.65757
Revenue Required - Rate Base	$ 11,946,115	$ 32,896
Purchased Water Cost	1,948,236	1,948,236
Operation and Maintenance Cost	2,307,408	64,180
Depreciation and Amortization	3,390,420	36,022
Total Revenue Required on Investment	$ 19,592,179	$ 2,081,334
Operating Revenue - Pinal Valley	$ 21,398,617	$ 21,398,617
Average Monthly Residential Bill	$ 29.62	$ 29.62
Monthly Increase per Average Residential Customer	$ 27.13	$ 2.87
Monthly Customer Savings		$ 24.26
Percentage of Monthly Customer Savings		89%

A-6 CAP Issue Brief, October 2014, Colorado River Shortage

CAP | Issue Brief

CENTRAL ARIZONA PROJECT

Strategic Initiatives & Public Policy

October 2014

COLORADO RIVER SHORTAGE

Based on current hydrologic conditions, there is a significant probability of an official declaration of shortage in the Colorado River water supply starting as early as 2016 or shortly after. Under shortage conditions the Central Arizona Project (CAP) will be subject to reductions in Colorado River water because CAP holds a "junior" priority[1] water entitlement to Colorado River water among the Lower Basin states (Arizona, California, and Nevada). Other low priority Colorado River contractors in Arizona, such as the Mohave County Water Authority, may also be subject to reductions during times of shortage. To prepare for possible shortage and to guide Colorado River operations during low reservoir conditions, the seven Colorado River Basin states and the Bureau of Reclamation (BOR) completed an agreement in 2007 ("Shortage Sharing Guidelines") identifying steps to be taken should a water shortage situation arise. In addition, CAP has worked with the Arizona Water Banking Authority to store excess CAP water underground. This stored water will be made available to protect municipal and industrial users from suffering reduced supplies during shortages and to meet Arizona's obligations pursuant to Indian Water Rights Settlements.

What is Shortage?

Each year, the Secretary of the Interior determines the status of the Colorado River water supply for the Lower Basin States in terms of it being in a Normal, Surplus, or Shortage condition. A Shortage condition is defined as "...insufficient mainstream water is available to satisfy 7.5 million acre-feet (maf)[2] of annual consumptive use in the Lower Division states." The Shortage Sharing Guidelines outline how and when the Secretary makes the annual water supply determination. The key factor for water supply determination is the amount of storage (as measured by water elevation) in Lake Mead. To date, a shortage has never been declared. There are a series of conditions and steps that must occur before a Shortage declaration would be made, including Lake Mead's water elevation falling below 1,075 feet.

Lake Powell and Lake Mead

Lake Mead releases water to meet water deliveries in Arizona, California, Nevada, and Mexico, while Lake Powell is operated to help the Upper Basin meet its obligations to deliver water to the Lower Basin. As part of the Shortage Sharing Guidelines, water levels in these two reservoirs are now coordinated to allow better management of the Colorado River supply. Four factors impact the water levels in Lakes Powell and Mead:

---

[1] The "Law of the River," interlocking Federal and State laws, inter-State compacts, court decrees, contracts, and international treaties, defined Arizona and CAP water priority. Arizona's total entitlement to Colorado River water is 2.8 million acre-foot (maf); CAP's share has junior priority status.

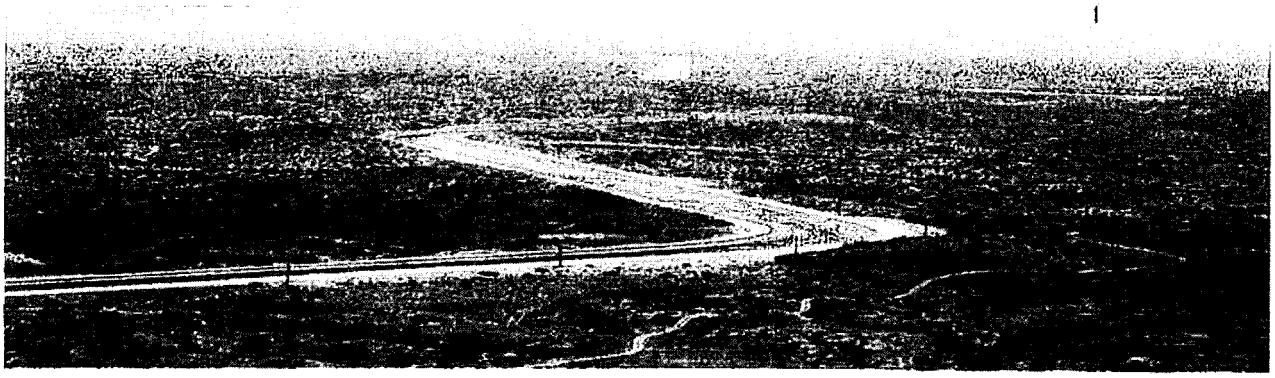
[2] An acre-foot is the amount of water it takes to cover an acre of land with one foot of water; about 326,000 gallons.

1. The uses in the Upper Basin States[3] - currently, these four states use about 60% of their entitlement to Colorado River water. The unused water flows to Lake Powell.
2. The hydrology of the Colorado River, such as the amount of precipitation that falls within the basin and the resulting runoff that flows into the river and reaches the reservoirs.
3. Colorado River reservoir operations.
4. Lower Basin uses and the structural deficit. The Lower Basin States and Mexico are currently using 100% of their entitlements[4]. These uses are larger than the normal inflow into Lake Mead resulting in an annual reduction in storage (structural deficit) within the reservoir.

One goal of the 2007 agreement is to balance storage between Lakes Powell and Mead. The idea is for the reservoirs to rise together in the event of wet conditions and, in the case of normal or dry conditions, fall together. This approach shares the water supply opportunities and risks among the Upper and Lower Basin States. The agreement creates a formula in which additional water in Lake Powell must be transferred to Lake Mead when Mead levels run low. When storage is roughly equal, the minimum required amount is released from Powell to Mead. When Powell has more storage than Mead, some additional water above the minimum requirement is transferred from Powell to Mead.

How would Arizonans be impacted if a shortage were declared?

If a shortage is declared by the Secretary of the Interior, most Arizonans will not notice any impact to their daily lives. Arizona has an entitlement to 2.8 maf of Colorado River water - including both water ordered by CAP contract holders and "excess" water delivered to other users and for recharge[5]. CAP uses about 1.6 maf of Arizona's entitlement every year. The senior water right users, who are mostly located along the Colorado River and within the Yuma area, would not have their supply reduced. While CAP holds a junior priority within Arizona and will be subject to shortages, CAP would manage a shortage by first reducing the excess water deliveries and ceasing portions of its recharge operations. Second, CAP would limit its water delivery to agricultural customers, who have limited rights to CAP water and could turn to pumping groundwater or other sources. If reductions are required beyond this level, then CAP would begin to recover CAP water stored underground. This would be done to protect existing municipal and industrial CAP customers from experiencing reductions in deliveries of CAP water and to recover water stored to meet Arizona's obligations pursuant to Indian Water Rights Settlements. A graphical depiction of how Colorado River water users, including CAP, would be impacted by various levels of shortage is provided in the last page of this document.



[3] The Upper Basin States are Colorado, New Mexico, Utah, and Wyoming.

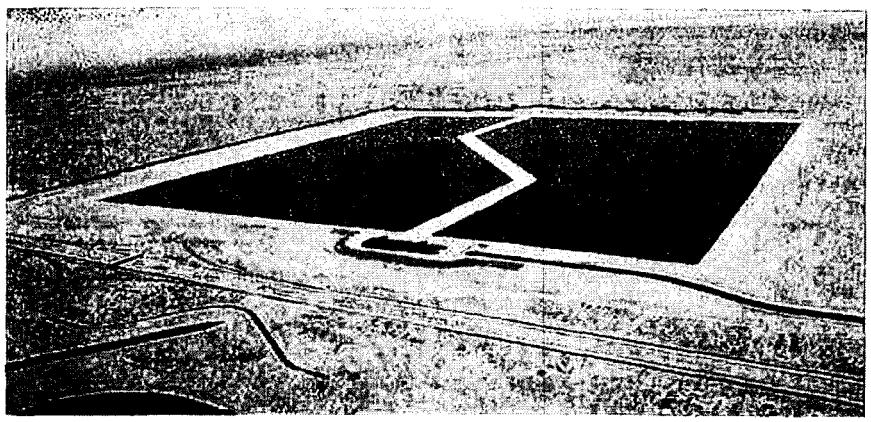
[4] The Lower Basin States of California, Arizona, and Nevada have annual Colorado River entitlements for 4.4, 2.8, and 0.3 maf respectively. Mexico has an annual entitlement of 1.5 maf.

[5] Excess CAP water is CAP water that is not ordered by long-term CAP contractors and any unused portion of Arizona's Colorado River entitlement delivered through the CAP system.

Other Shortage Solutions

Water professionals throughout Arizona and the seven Basin States have spent many years managing this issue. The CAP has taken part in programs that work toward making our water supply system more resilient to changes in climate and variable water levels. Some examples are:

- CAP, in partnership with Lower Basin water agencies, funded the construction of a new off-stream reservoir – Brock Reservoir[6] (see figure below) to reduce losses from water that is ordered but not diverted by Colorado River users.
- CAP is working on increasing runoff by participating in cloud seeding in Colorado, Wyoming, and Utah, and improving vegetation management along the River.
- CAP, BOR, and the Basin States reached an agreement, through Minute 318[7], with Mexico to allow Mexico to store up to 260,000 af in Lake Mead until the 2010 earthquake damage to irrigation infrastructure in Mexico can be repaired and Mexican agricultural users can effectively use their full entitlement. The additional storage could reduce the likelihood of a shortage declaration in the near term.
- CAP along with BOR and the Basin States, through Minute 319[7], reached an agreement with Mexico wherein Mexico would accept reductions in its deliveries during shortage periods in the Lower Basin.
- CAP, BOR, Southern Nevada Water Authority, and Metropolitan Water District of Southern California, are funding partners through Minute 319[7] for a conservation project. Through this project, Mexico is expected to conserve 124,000 af, creating additional storage in Lake Mead.
- CAP, with other Colorado River partners, is developing a Drought Response Plan to mitigate the impacts of a shortage in the Lower Colorado River Basin and to address the existing imbalance between supply and demand (structural deficit).
- CAP, in partnership with water agencies in the Colorado River Basin and BOR, has funded the System Conservation Agreement and the Innovative Conservation Agreement. Both agreements provide funds for fallowing activities and new conservation technology within the basin, respectively.
- CAP, in partnership with irrigation districts in central Arizona, has created an Agricultural Forbearance Program. Under the program, CAP provides incentives for the irrigation districts to reduce their use of CAP water. The conserved CAP water will be stored in Lake Mead, with the goal of attempting to reduce the probability of Colorado River shortages.



[6] The Warren H.Brock (formerly Drop 2) Reservoir was completed in October 2010 and is currently operational. The reservoir is located in California, along the All American Canal, near El Centro.

[7] Minute 318 and Minute 319 are addendums to the 1944 U.S./Mexico Treaty

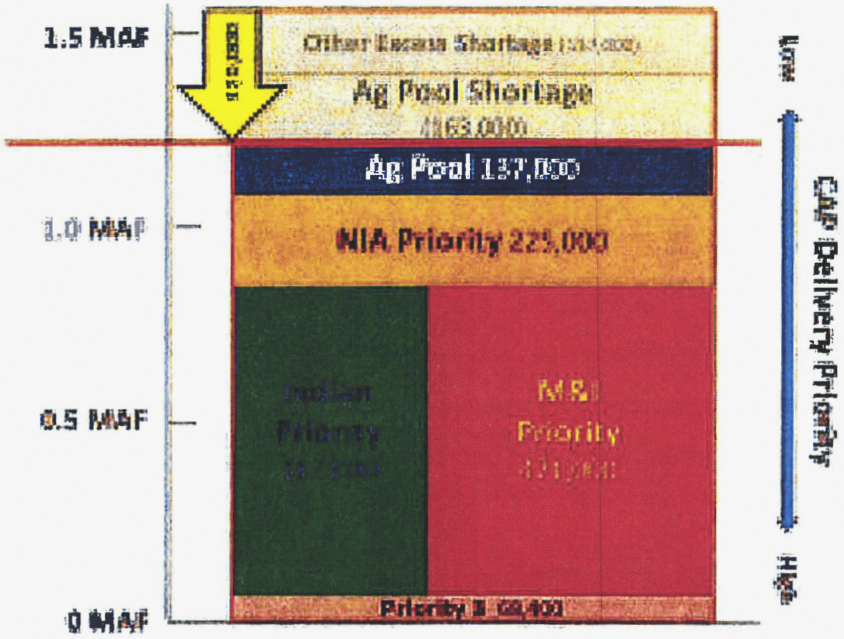
Colorado River Shortage Process:

1. Shortage Notice

2. Shortage Sharing: There are 3 tiers of shortage reductions triggered by water elevations in Lake Mead. Arizona bears the brunt of the reductions; with CAP taking most of the reductions.

Entity	Tier 1 (1,075')	Tier 2 (1,050')	Tier 3 (1,025')
CAP[2]	Up to 320,000 af	Up to 400,000 af	Up to 480,000 af
Other Arizona[3]	0 to 32,000 af	0 to 40,000 af	0 to 48,000 af
Nevada	13,000 af	17,000 af	20,000 af
Mexico[4]	50,000 af	70,000 af	125,000 af

3. Shortage Reductions to CAP Pools (based on a 2017 shortage)



Notes:
1. USBR provides 24-month water forecasts, updated monthly.
2. CAP's portion of shortage is related to water uses by other Arizona "on-river" users, which varies annually.
3. Other Arizona water users' portion of shortage is based on their annual water usage.
4. Mexico's share of shortage is subject to Minute 319.

For more information, please contact the Central Arizona Project's Strategic Initiatives & Public Policy Office at 623-869-2150.

Arizona Water Company

White Tank
Central Arizona Project
Water Use Plan

2015 Update

August 7, 2015

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A-1 Arizona Water Company's Opinion of Probable Construction Cost Estimate

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A-4 CAP Issue Brief, October 2015, Colorado River Shortage

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1. Introduction

In this 2015 Central Arizona Project ("CAP") Water Use Plan ("2015 CAP Use Plan"), Arizona Water Company ("Arizona Water") presents its plan to deliver CAP water to its customers through underground storage and recovery beginning in 2016. The estimated construction cost of Arizona Water's underground storage and recovery facility is $2.6 million making it a practical, cost-effective and financially feasible alternative to surface water treatment and direct delivery of CAP water which would cost $11.2 million.

Arizona Water's earlier 2006 CAP Use Plan (filed with the Arizona Corporation Commission pursuant to Decision No. 68302 on December 29, 2006), called for Arizona Water to partner with Arizona-American Water Company ("AAWC") (now "EPCOR") to construct a 13.5 million gallon per day ("MGD") surface water treatment plant at an estimated cost (in 2006 dollars) of approximately $63 million. Arizona Water's 1.0 MGD capacity share of this surface water treatment plant would have cost $4.7 million. An 8-mile long 12-inch water transmission line extending from AAWC's surface water treatment plant to Arizona Water's White Tank service area would have cost Arizona Water an additional $6.5 million, for a total cost of $11.2 million. EPCOR is using the full 13.5 MGD capacity to serve its customers and no longer has capacity available to Arizona Water from its surface water treatment plant. As a result, Arizona Water developed a far less costly and more efficient means of delivering much needed CAP water to Arizona Water's White Tank customers than by constructing a costly and labor intensive surface water treatment plant and 12-inch water transmission line.

Arizona Water's plan to use CAP water to serve its customers through recharge and recovery coincides with the State of Arizona's public policy directives on water storage and water savings. More specifically, Arizona's policy on water storage, water savings and replenishment, as codified in Arizona Revised Statutes ("ARS") Section § 45-801.01 states:

> *The public policy of this state and the general purposes of this chapter are to:*
>
> *1. Protect the general economy and welfare of this state by encouraging the use of renewable water supplies, particularly this state's entitlement to Colorado river water, instead of groundwater through a flexible and effective regulatory program for the underground storage, savings and replenishment of water.*
>
> *2. Allow for the efficient and cost-effective management of water supplies by allowing the use of storage facilities for filtration and distribution of surface water instead of constructing surface water treatment plants and pipeline distribution systems.*

Arizona Water's use of CAP water through groundwater recharge, storage, and recovery, as described in this 2015 CAP Use Plan, complies with and advances this crucial public policy by using Colorado River water delivered by CAP. Arizona Water's plan also advances this policy by efficiently and cost-effectively managing water supplies through the use of underground storage facilities and recovery wells, instead of constructing a very costly and labor intensive surface water treatment plant and 12-inch water transmission line.

This 2015 CAP Use Plan provides an overview of water supplies and demands in the Phoenix Active Management Area ("AMA"), both historical and projected, which also shows the State's over-reliance on over drafting native groundwater, i.e., pumping groundwater faster than

it is replaced naturally. According to the Arizona Department of Water Resources ("ADWR"), increased over-reliance on native groundwater throughout the Phoenix AMA threatens the sustainability of groundwater supplies for the Phoenix AMA including Arizona Water's White Tank service area.[1] As a result, there is a demonstrated need to maximize the beneficial use of renewable water supplies such as CAP water as soon as practicable. Recharging CAP water at an underground storage facility, besides being an efficient and cost-effective way to manage Arizona Water's CAP water allocation, is consistent with the policies and recommendations of ADWR, CAP, and the Arizona Water Banking Authority ("AWBA") in the studies and reports listed below.

Furthermore, Arizona Water's use of CAP water as described in this 2015 CAP Use Plan conserves and protects groundwater in compliance with Arizona's 1980 Groundwater Management Act ("GMA") as codified in ARS § 45-401(B) which states:

> *"It is therefore declared to be the public policy of this state that in the interest of protecting and stabilizing the general economy and welfare of this state and its citizens it is necessary to conserve, protect and allocate the use of groundwater resources of the state and to provide a frame work for the comprehensive management and regulation of the withdrawal, transportation, use, conservation and conveyance of rights to use the groundwater in this state."*

In addition, Arizona Water's use of CAP water as discussed in this 2015 CAP Use Plan furthers the Phoenix AMA management goal by reducing the amount of groundwater pumped by over 8,000 acre-feet over the next ten years, helping to achieve safe yield and preserving those supplies for future non-irrigation uses. Recharging CAP water in underground storage and groundwater savings facilities also protects against shortages when deliveries of CAP water from the Colorado River are cut back or curtailed.

2. Underground Storage and Recovery

2.1. Background

In the 1980s, Arizona's need to replenish its dwindling groundwater aquifers, coupled with the availability of surface water supplies, led to development of an active groundwater storage and recovery program. Since that time, storage and recovery (also known as recharge and recovery) has emerged as one of the most important and effective water management tools for the state, particularly in meeting Arizona's policy goals of protecting the general economy and welfare of the state by using renewable supplies, such as CAP water, instead of relying on over drafted groundwater.[2] As further evidence of the benefits of storing CAP water underground, ADWR's demand and supply assessment for the Phoenix AMA identified replenishment of groundwater with surface water such as CAP water (or treated wastewater effluent), as a flexible, cost-effective approach to making use of these much needed renewable water supplies. [3]

---

[1] Arizona Department of Water Resources, *Draft Demand and Supply Assessment, 1985-2025 Phoenix Active Management Area, November 2010.*

[2] Arizona Revised Statutes Section § 45-801.01 1-2

[3] Ibid.

ADWR is the state agency that administers Arizona's storage and recovery program and has primary responsibility for enforcing laws and regulations governing storage and recovery through a system of permits and reporting requirements. ADWR also maintains records of all storage facilities and tracks the amount of water stored by each permit holder in separate water storage accounts for each such permit holder. No entity may store water underground without an ADWR issued water storage permit. In addition, entities storing water may not physically recover such water without an ADWR issued recovery well permit. Storing water underground accrues annual or long-term storage credits depending on the eligibility of the entity storing water and the timing of recovery.

Under ADWR's recharge and recovery program, permit holders can store water at either underground storage facilities or groundwater savings facilities. Typically, underground storage facilities are designed and constructed to use recharge (or spreading) basins where water percolates and directly recharges the groundwater aquifer through infiltration. Other types of underground storage facilities, such as shallow wells (vadose zone) or deep injection wells, are used when recharge basins are impractical or technically not feasible. In the alternative, groundwater savings facilities are used for "indirect" recharge, and are operated by agricultural irrigation districts that normally pump groundwater. These groundwater savings facility operators have facilities in place to receive deliveries of CAP water in lieu of the agricultural irrigation districts having to pump groundwater, thereby saving groundwater and creating groundwater storage credits equal to the quantity of CAP water delivered to the irrigation district. As a result, the groundwater aquifer is recharged indirectly by saving groundwater (hence, the term *groundwater savings facilities*).

2.2. Arizona Water's White Tank Recharge and Recovery Facility

Arizona Water holds a CAP water allocation totaling 968 acre-feet per year in its White Tank service area. In order to put its full CAP allocation to use for water service to customers, Arizona Water plans to construct its White Tank Recharge and Recovery Facility in the northeastern part of its White Tank service area. A map showing the general location of the White Tank Recharge and Recovery Facility is included as Figure 2-1, and a conceptual plan showing the recharge basins and connection to Maricopa Water District's Beardsley Canal is shown in Figure 2-2.

Figure 2-1 White Tank Service Area and White Tank Recharge and Recovery Facility General Location

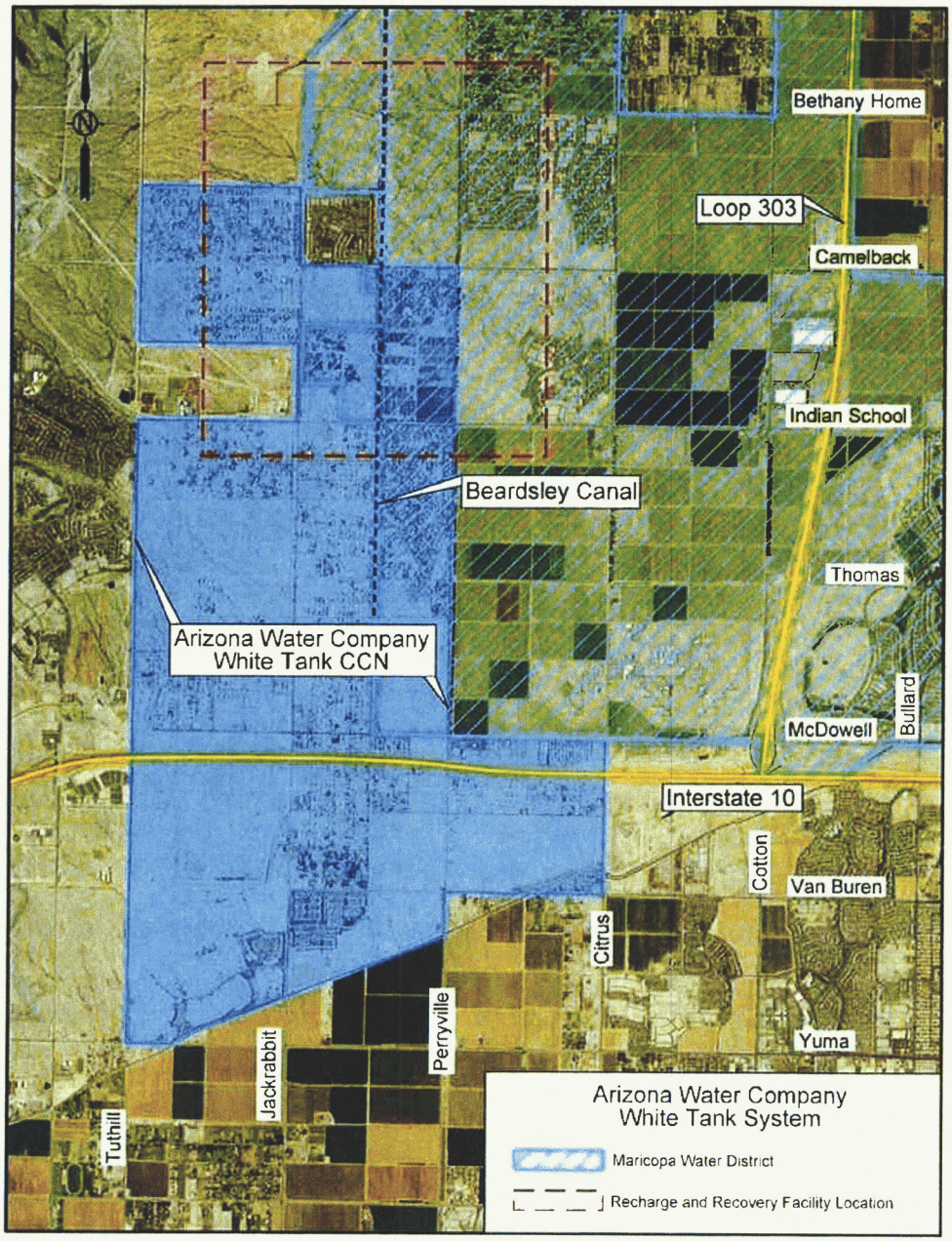
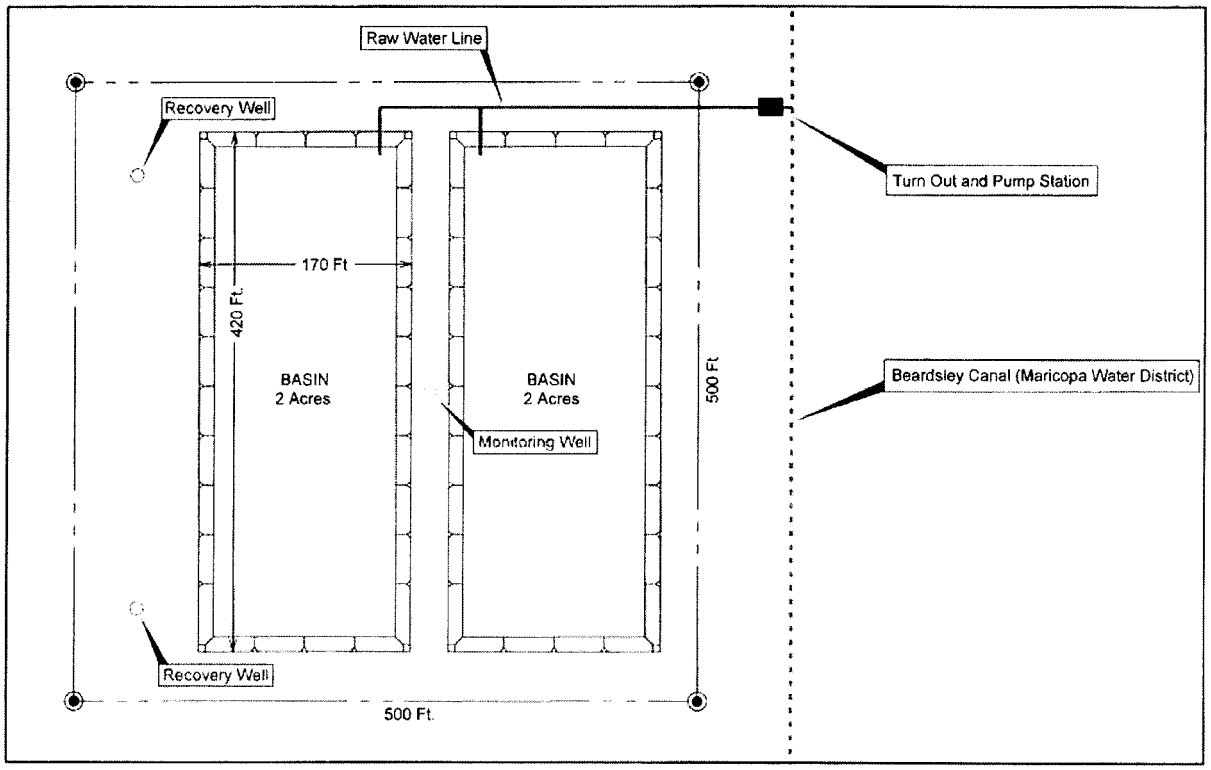


Figure 2-2 White Tank Recharge and Recovery Facility Conceptual Plan



Similar to its Pinal Valley 2015 CAP Use Plan, Arizona Water plans to conduct a hydrogeologic study to determine property suitable for recharge purposes and to establish design parameters for the White Tank Recharge and Recovery Facility. Based on the rates of CAP water recharge for Arizona Water's Pinal Valley Recharge and Recovery Facility, a recharge facility with 4 acres of recharge basins will be capable of recharging Arizona Water's full 968 acre-feet CAP allocation.

For purposes of this 2015 CAP Use Plan, Arizona Water has used 1,000 acre-feet per year as the full build out capacity of this facility to account for the 2-3 months when each recharge basin is not used because of necessary maintenance. Regular maintenance of the White Tank Recharge and Recovery Facility includes sediment removal and scarification (i.e., tilling the basin surface to prevent clogging), repair and adjustment of monitoring wells, and calibration and repair of water meters and other appurtenances.

Untreated CAP water will be pumped from Maricopa Water District's Beardsley Canal to the White Tank Recharge and Recovery Facility through approximately 1,000 lineal feet of 12-inch water transmission line. ADWR requires one monitoring well near the recharge basins as part of the required water storage permit to measure the level of groundwater mounding caused by percolating CAP water. Due to the high quality of CAP water, Arizona Water will not need to treat the water prior to recharge in the White Tank Recharge and Recovery Facility recharge (spreading) basins.

2.3. Recovery of Stored CAP Water

Arizona Water will initially recover stored CAP water from any of its seven existing wells located throughout its White Tank service area pursuant to recovery well permits issued by ADWR. Arizona Water may also recover stored CAP water from one or more

recovery wells constructed at or near the White Tank Recharge and Recovery Facility site and deliver it to the White Tank service area distribution system through a 12-inch water transmission main. Arizona Water will construct recovery wells at the recharge site as needed to satisfy water system production needs and to meet its needs for recovery of stored CAP water.

2.4. White Tank Recharge and Recovery Facility – Cost Estimate

Arizona Water's engineers prepared an engineering estimate of $2.6 million for the White Tank Recharge and Recovery Facility. A detailed breakdown of this cost estimate is included as Appendix A-1. The estimate includes costs to construct 200 lineal feet of 12-inch water transmission line and related infrastructure required to deliver water from Maricopa Water District's Beardsley Canal to the White Tank Recharge and Recovery Facility recharge basins. A schedule showing both the cost and recharge capacity for the White Tank Recharge and Recovery Facility is shown in Table 2-1 below.

Table 2-1 White Tank Recharge and Recovery Facility Cost Estimate

Basin Area (Acres)	Facility Recharge Capacity (AF per year)[4]	Construction Cost
4.0	1,000	$2,641,000

Note 1: Facility Recharge Capacity reflects 2-3 months when recharge basins are not used because of necessary maintenance.

Note 2: Additional CAP Water, recycled water or other renewable supplies may be available for recharge at this facility.

Arizona Water's engineering estimates show an opinion of probable operations and maintenance ("O&M") costs for the White Tank Recharge and Recovery Facility of $25,000 per year.[5] The O&M cost estimate for the White Tank Recharge and Recovery Facility is based on similar costs for Arizona Water's Pinal Valley Recharge and Recovery Facility. Arizona Water will further develop and refine O&M cost estimates as it gains experience operating and maintaining its Pinal Valley Recharge and Recovery Facility, and from conducting a pilot recharge program for the White Tank Recharge and Recovery Facility site selected for this recharge facility in 2016 or 2017.

Arizona Water plans to fund the construction of the White Tank Recharge and Recovery Facility primarily with offsite facilities fees. Also, Arizona Water will seek federal and state grants, and at current projections it appears that company funds are necessary to construct this recharge facility.[6] Arizona Water anticipates that it will start construction of the White Tank Recharge and Recovery Facility in 2018.

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[4] Prior to full-build out of the USF, CAP water will be delivered to a GSF.

[5] Details of the Opinion of Probable Operations and Maintenance Costs is located in Appendix A-2

[6] Arizona Water plans to file a general rate case for its Western Group of water systems by August 31, 2015, in which it will seek Commission approval for offsite facilities fees for its White Tank water system.

Table 2-2 White Tank Recharge and Recovery Facility Construction Cost and Projected Offsite Facilities Fees

Year	Recharge and Recovery Facility Construction Cost	Offsite Facilities Fees Available*	Projected Company Funds Needed To Complete Construction
2018	$2,641,000	$1,075,000	$1,566,000

*Note: Projected Offsite Facilities Fees. Federal or state grants that are received would reduce the need for offsite facilities fees or company funds.

2.5. White Tank Recharge and Recovery Facility Feasibility and Customer Savings

Arizona Water analyzed the effect on White Tank customers' water rates by comparing the cost of constructing and operating its White Tank Recharge and Recovery Facility to the cost of constructing and operating a surface water treatment plant and 12-inch water transmission line, as originally planned in the 2006 CAP Use Plan. Table 2-3 below shows the cost savings achieved by constructing, operating and maintaining the White Tank Recharge and Recovery Facility instead of the costly and labor-intensive surface water treatment plant and 12-inch water transmission line.

Table 2-3 Cost Savings Associated with White Tank Recharge and Recovery Facility

Category	Surface Water Treatment Plant	Recharge and Recovery Facility	*SAVINGS*
Construction Cost	$11.2 million	$2.6 million*	**$8.6 million**
Annual Operating and Maintenance Cost	$395,000	$215,000	**$180,000**
Annual Overall Revenue Requirement	$2.1 million	$500,000	**$1.6 million**
Monthly Customer Cost	$43.43	$10.13	**$33.30 or 77%**

*This amount is paid by Offsite Facilities Fees and company funds as shown in Table 2-2.

As Table 2-3 shows, delivering CAP water to customers through recharge and recovery at Arizona Water's White Tank Recharge and Recovery Facility will save customers $1.6 million per year compared to constructing, operating, and maintaining a costly surface water treatment plant and 12-inch water transmission line. As a result, the average residential customer will save $33.30 per month, or 77%, compared to a surface water treatment plant and 12-inch water transmission line, showing that Arizona Water's plan to use CAP water through recharge and recovery at the White Tank Recharge and Recovery Facility is the most cost-effective, practical and thus feasible option.

Beyond the cost savings for the average residential customer, another reason to construct the White Tank Recharge and Recovery Facility instead of a costly surface water treatment plant and 12-inch water transmission line is the limited availability of contributed capital through offsite facilities fees. Even with an off-site facilities fee, Arizona Water would have needed to raise $11.2 million of investment capital (i.e. equity or debt) to pay for 1.0 MGD of capacity in EPCOR's White Tank surface water treatment plant and 12-inch water transmission line. To put that $11.2 million of plant investment into perspective, paying for 1.0 MGD of capacity in EPCOR's surface water treatment plant and constructing 8 miles of 12-inch water transmission line would increase Arizona Water's White Tank water system rate base by 220%. On the other hand, Arizona Water expects to be able to fund most, if not all of the entire cost of the White Tank Recharge and Recovery Facility with offsite facilities fees and federal

and state grants, which are recorded as contributions in aid of construction and excluded from rate base, thereby keeping customer rates low.

Given the cost savings and the feasibility of the White Tank Recharge and Recovery Facility, constructing a costly surface water treatment plant and 12-inch water transmission line is neither feasible nor prudent now or in the foreseeable future.

2.6. Interim Plan to Recharge and Recover CAP Water

Prior to completing construction of the White Tank Recharge and Recovery Facility, Arizona Water plans to store and recover CAP water for delivery to customers on an interim basis starting in 2016 by storing CAP water at a groundwater savings facility. To this end, Arizona Water has been able to negotiate a short-term contract with Maricopa Water District to store CAP water in a groundwater savings facility owned and operated by Maricopa Water District.

Under this interim approach, Arizona Water will schedule delivery of CAP water to Maricopa Water District in lieu of their pumping groundwater. Under the terms of Arizona Water's water storage permits, every acre-foot of water delivered to the irrigation districts for use in lieu of pumping groundwater generates an acre-foot of CAP water storage credit. Arizona Water can then recover an equivalent amount of stored CAP water from its recovery wells and directly deliver recovered CAP water to its White Tank customers.

Under the groundwater savings facility contract, Maricopa Water District will pay $16 per acre-foot to help offset Arizona Water's cost to purchase CAP water for groundwater storage. This offset reduces the net cost of CAP water to Arizona Water and its customers.

In 2016, Arizona Water will store 375 acre-feet of CAP water at Maricopa Water District's groundwater savings facility. Arizona Water plans to increase the amount of CAP water stored at this groundwater savings facility by 125 acre-feet each year until its full allocation is delivered to the company's customers from the recharge and recovery facility. When the White Tank Recharge and Recovery Facility is completed, Arizona Water will shift deliveries of CAP water to that facility from the groundwater savings facility.

Table 2-4 below shows the projected schedule and net cost of CAP deliveries to the groundwater savings facility and the White Tank Recharge and Recovery Facility by year:

Table 2-4 CAP Water Deliveries and Cost to Recharge CAP Water

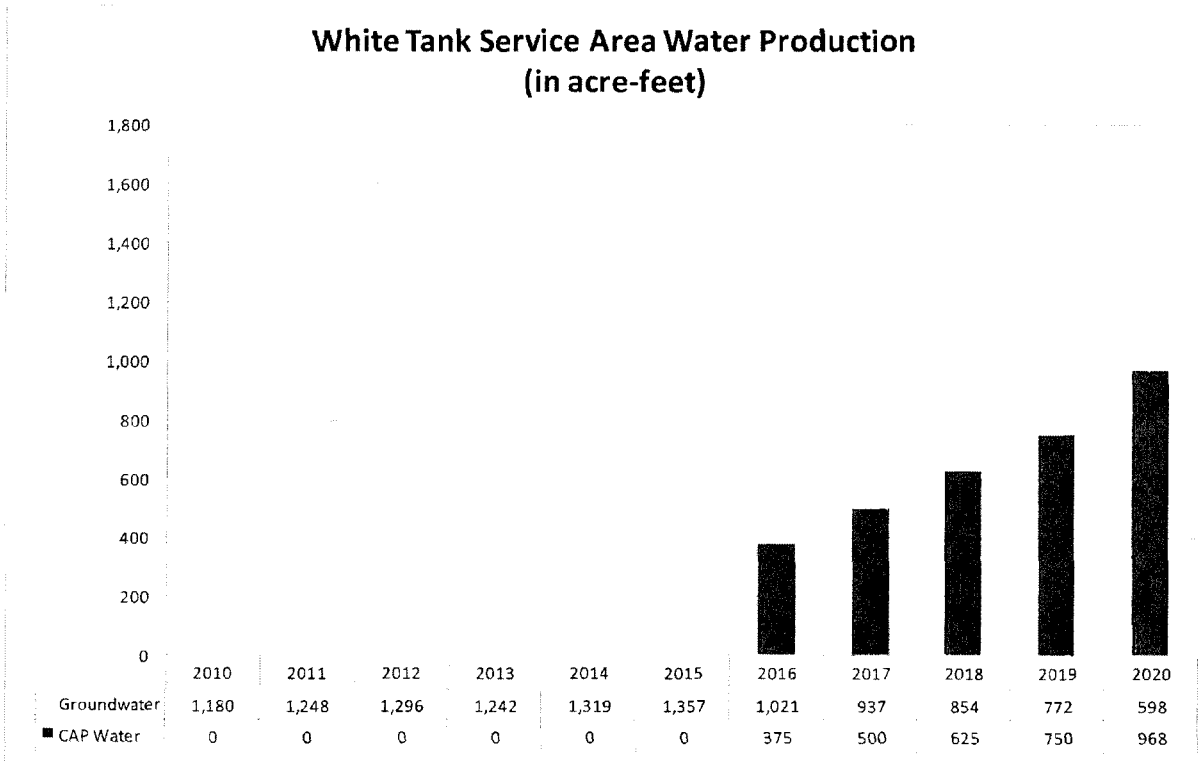
Year	Recharge and Recovery Facility (AF)	Groundwater Savings Facility Recharge (AF)	Cost of CAP Water ($/AF)	Groundwater Savings Facility Offset ($/AF)	Recharge and Recovery Facility Cost ($)	Total Groundwater Savings Facility Cost ($)	Annual Recharge Cost ($)[7]
2015	0	0	$157	N/A	$0	N/A	$0
2016	0	375	$161	$16	$0	$54,375	$54,375
2017	0	500	$166	$16	$0	$75,000	$75,000
2018*	625	0	$171	N/A	$106,875	N/A	$106,875
2019	750	0	$174	N/A	$130,500	N/A	$130,500
2020	968	0	$196	N/A	$189,728	N/A	$189,728

*CAP water ordered for 2018 at the White Tank Recharge and Recovery Facility after recharge basins are completed.

2.7. Future Water Supplies Under this 2015 CAP Use Plan

Arizona Water's total 2014 water production in its White Tank service area was 1,319 acre-feet of pumped groundwater. Implementing this 2015 CAP Use Plan will significantly increase the amount of CAP water recharged and recovered, as shown in Figure 2-3, below.

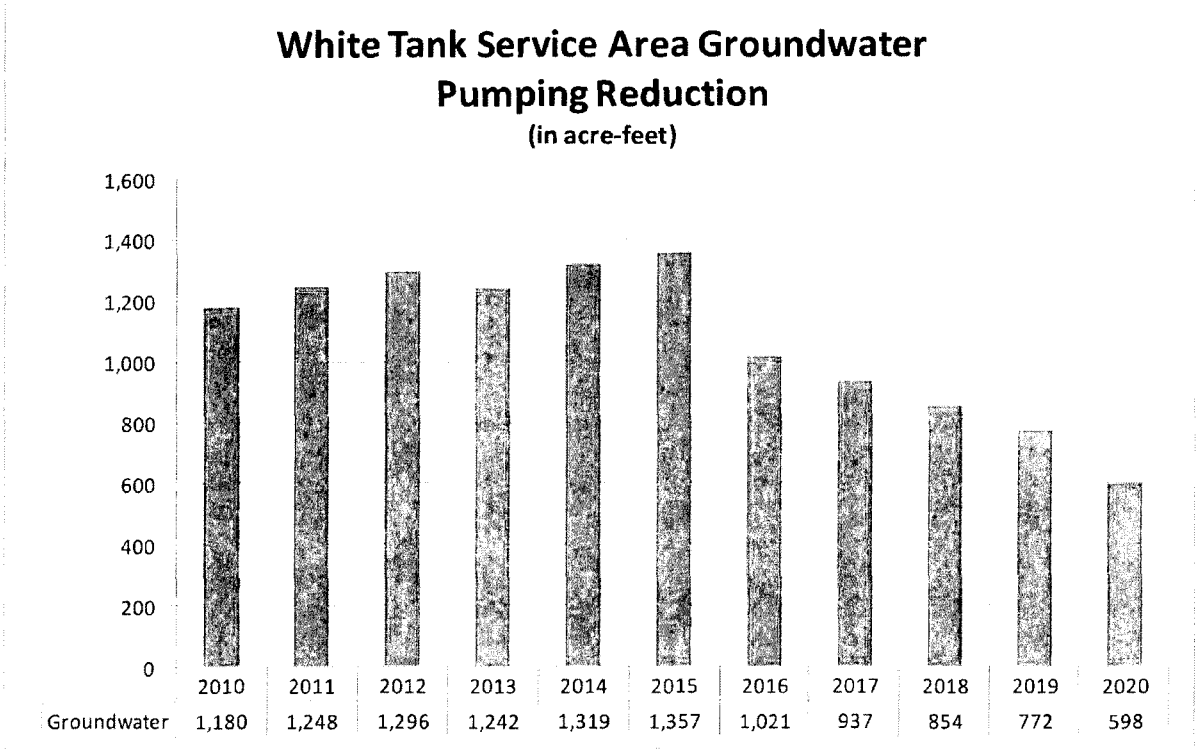
Figure 2-3 White Tank Service Area Water Production



[7] Recharge and Recovery Facility cost does not include $25,000/year O&M cost.

Under this 2015 CAP Use Plan, Arizona Water will reduce groundwater pumping from 2014 levels by nearly 55% or 721 acre-feet by 2020, as shown in Figure 2-4 below. Over the next ten years, Arizona Water will recharge an average of 800 acre-feet of CAP water per year and will have saved over 8,000 acre-feet of groundwater.

Figure 2-4 White Tank Service Area Groundwater Pumping Reduction



3. State and Regional Water Policies Require Arizona Water to Effectively Use its CAP Water Supplies

3.1. Arizona's Need to Address Water Supply Sustainability

Arizona has a long history of successfully addressing the state's need for sustainable, renewable, and effectively managed water supplies, while meeting water users' needs. Since Arizona Water completed its 2006 CAP Use Plan, the State of Arizona, as well as a number of federal agencies, have completed studies, reports, assessments, and plans documenting current and future water resource planning needs in Arizona and in other states that rely on Colorado River water. Four of these key documents that Arizona Water relied upon and references in this 2015 CAP Use Plan are:

- *Draft Demand and Supply Assessment 1985-2025: Phoenix Active Management Area ("AMA"), November 2010* – This assessment was prepared by ADWR as background for development of the Fourth Management (Conservation) Plan for the Phoenix AMA. ***ADWR's assessment concludes that groundwater pumping will likely increase in the Phoenix AMA through 2025.***

- *U.S. Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study: Study Report, December 2012* – This study, prepared by the Bureau of Reclamation, represents the most comprehensive analysis ever undertaken within the Colorado River Basin. ***This study concludes that there is an increased likelihood of future shortages of Colorado River water, having the greatest impact on agricultural users and affecting other CAP users as well.***

- *Arizona's Next Century: A Strategic Vision for Water Supply Sustainability, January 2014* - This report was prepared by ADWR as a next step to identify possible strategies to address identified water supply and demand imbalances. ***ADWR's study concludes that an appropriate water management strategy needs to include underground storage and recovery of CAP water and reclaimed water.***

- *Recovery of Water Stored by the Arizona Water Banking Authority, April 2014* – This plan is a collaborative effort among the AWBA, ADWR, CAP and stakeholders to provide a roadmap for recovering CAP water stored in each of the AMAs by the AWBA. ***This Plan discusses the amount of CAP water stored in the Phoenix AMA and how stored CAP water can be recovered through recovery partnerships with entities such as Arizona Water.***

As summarized above, these studies, reports, assessments, and plans conducted by state and federal agencies demonstrate the urgent need to address issues ranging from an increase in groundwater pumping to shortages of Colorado River water. The state agencies charged with addressing these challenges, ADWR, CAP and AWBA, agree that maximizing recharge of available CAP water for underground storage and recovery must play an integral role in assuring that Arizona's water users have long-term, reliable, renewable, and sustainable sources of supply, even as flows and availability of water from the Colorado River become less predictable.

3.2. The Groundwater Management Act

Prior to 1980, groundwater pumping in Arizona was largely unregulated which led to groundwater overdraft. In response, Arizona adopted one of the most comprehensive groundwater management programs in the United States – the 1980 Groundwater Management Act.[8] In order to facilitate management of groundwater supplies in areas where historical groundwater overdraft had been particularly severe, the Groundwater Management Act designated AMAs within certain high growth and water use areas in the state. Arizona Water's White Tank service area is located in the Phoenix AMA. The management plans for the AMAs, including the Phoenix AMA, are administered by ADWR and require municipal water providers, like Arizona Water, to progressively reduce their reliance on groundwater through the use of renewable water supplies like CAP water, recycled water, or through member land or service area enrollment in the Central Arizona Groundwater Replenishment District.[9]

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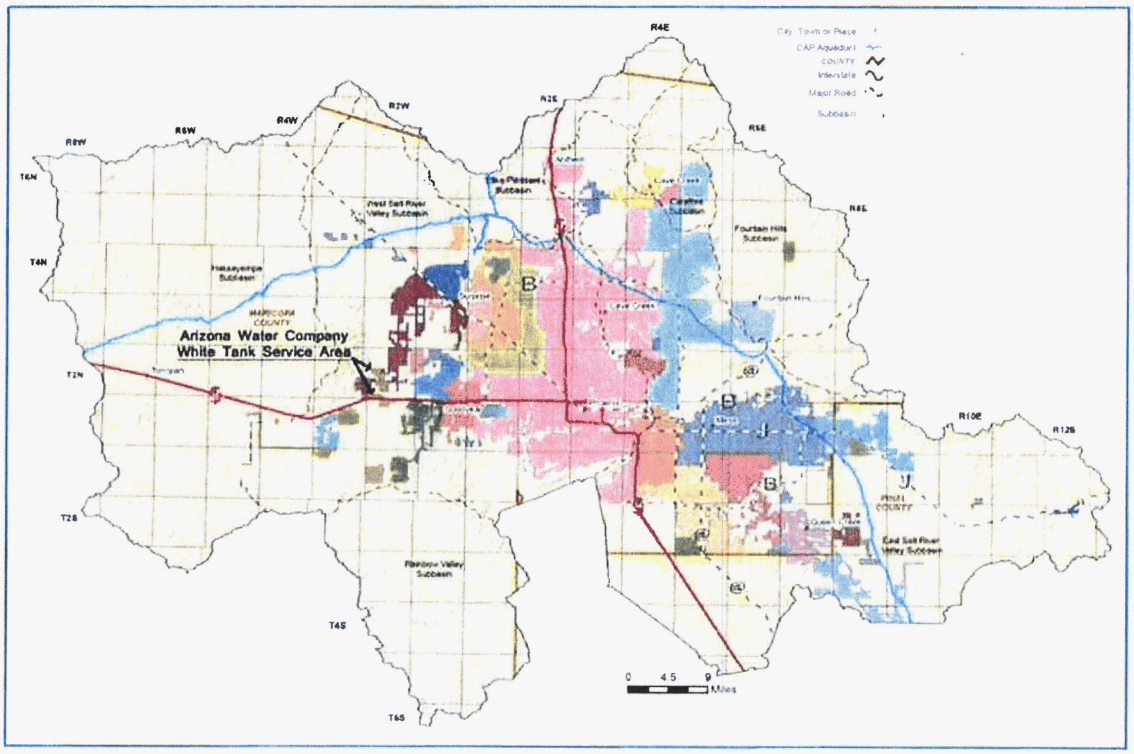
[8] As codified in A.R.S. § 45-401 through § 45-704

[9] The Central Arizona Groundwater Replenishment District is the name used to describe the groundwater replenishment authority operated by the Central Arizona Water Conservation District the entity charged with operating and maintaining the CAP aqueduct throughout its three-county service area.

The Phoenix AMA, shown in Figure 3-1, covers 5,646 square miles in the central portion of Arizona. The management goal for the Phoenix AMA is to achieve safe-yield by 2025 and maintain it thereafter.[10] Safe-yield means that the amount groundwater pumped from the AMA on an average annual basis does not exceed the amount of water that is naturally or artificially recharged. Safe-yield is a basin-wide balance; water level declines in one portion of the AMA could be offset by reducing groundwater pumping or recharging water in another part of the AMA.[11]

Figure 3-1 - Phoenix AMA



The Company's White Tank system is located in the West Salt River Valley sub-basin of the Phoenix AMA. This sub-basin includes most of western Maricopa County. The Phoenix AMA and its sub-basins, including the West Salt River Valley sub-basin, are also shown in Figure 3-1.[12]

As discussed in Section 2.7 and shown in Figures 2-2 and 2-3, Arizona Water will reduce groundwater pumping by 375 acre-feet per year in 2016, with corresponding increases on recovery of stored CAP water, followed by annual increases of 125 acre-feet of CAP recharge each year thereafter until its full CAP water allocation of 968 acre-feet is put to beneficial use, further reducing the need to pump groundwater. As a result, Arizona Water's water supply management strategy complies with the State of Arizona's public policy that requires greater use of renewable supplies such as CAP water. Arizona Water's 2015 CAP Use Plan also helps to achieve the Phoenix AMA's safe yield management goal.

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[10] Arizona Department of Water Resources, Third Management Plan - Phoenix Active Management Area, 1999

[11] Ibid., 3.

[12] Arizona Department of Water Resources, *Third Management Plan for Phoenix Active Management Area*, 1999, Phoenix, 1-2.

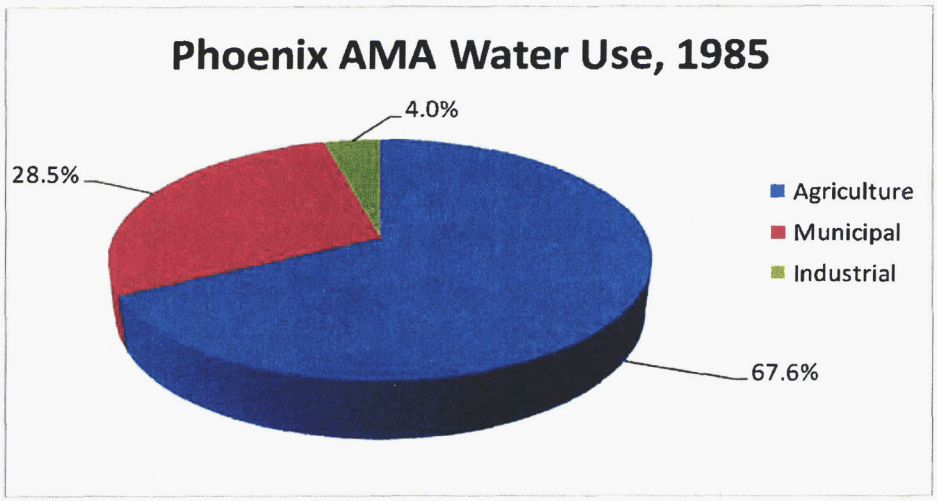
3.3. Water Use in the Phoenix AMA

In the Phoenix AMA, water is used primarily to meet municipal, industrial, agricultural and Indian demands. The beneficial uses of water, as defined by ADWR, are summarized as follows:

- Municipal water use, which includes water delivered for non-irrigation uses by a city, town, private water company or irrigation district.
- Industrial water use, which includes non-irrigation uses of water not supplied by a city, town, or private water company. Industrial use includes uses by animal industries, mines and power plants.
- Agricultural water use is water for agricultural uses (growing of crops) not located on Indian Reservations.
- Indian water use is municipal or agricultural water used on Indian Reservations.

In 1985, total water use in the Phoenix AMA was 2,227,284 acre-feet. At that time, non-Indian and Indian agricultural use accounted for 67.6 percent of total water use in the Phoenix AMA, while municipal and industrial use collectively accounted for 32.4 percent (28.5 percent for municipal and 3.9 percent for industrial) (*See* Figure 3-2 below).[13]

Figure 3-2 Phoenix AMA Water Use 1985



As shown in Table 3-1 below, total water use in the Phoenix AMA increased slightly from 2,227,284 acre-feet in 1985 to 2,235,680 acre-feet in 2006. Municipal water use increased from 633,757 acre-feet to 1,118,409 acre-feet and industrial water use increased from 88,667 acre-feet to 161,380 acre-feet during this same time period, collectively accounting for 57.2 percent of total water use in the Phoenix AMA in 2006.[14] Non-Indian agricultural and Indian communities water use decreased from 1,504,860 acre-feet in 1985 to 955,891 acre-feet in 2006, accounting for 42.8 percent of total water use in the Phoenix AMA in 2006.

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[13] ADWR's Draft Demand and Supply Assessment 1985-2025: Phoenix Active Management Area, November 2010
[14] Ibid.

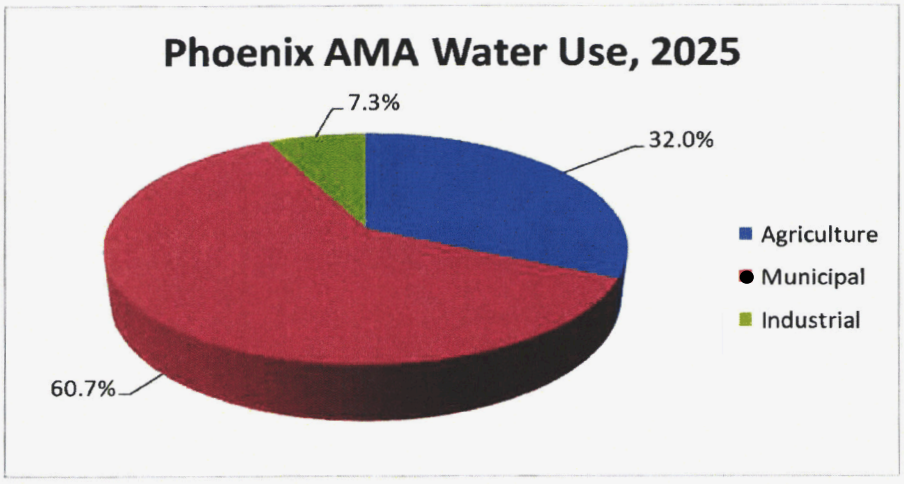
Table 3-1 Water Used in Phoenix AMA 1985 and 2006 (in acre-feet)

	1985		2006	
Non-Indian Agriculture Use	1,265,633		730,025	
Indian Communities Use	239,227		225,866	
Total Agriculture Use	1,504,860	67.6%	955,891	42.2%
Municipal Use	633,757	28.5%	1,118,409	49.4%
Industrial Use	88,667	3.9%	161,380	8.4%
Total Municipal and Industrial Use	722,424	32.4%	1,279,789	57.8%
Total Use	2,227,284	100.0%	2,235,680	100.0%

3.4. Future Water Uses in the Phoenix AMA

ADWR's *Draft Demand and Supply Assessment 1985-2025 Phoenix Active Management Area, November 2010* provides three water demand scenarios for the year 2025 for each category of water use in the Phoenix AMA. In all demand scenarios, overall water uses are projected to increase significantly, with the projected increase in total water uses ranging from between 12 percent and 55 percent, as compared to 2006. Municipal and industrial water uses are expected to continue to increase in the future as the Phoenix AMA urbanizes and population increases. Municipal water use increases are significant, ranging from a low of 33 percent to a high of 88 percent. Projections of Non-Indian agricultural and Indian Communities water use range from a 13.5 percent decrease to a 15.8 percent increase, depending upon the scenario and the category of water use. While Indian communities water use is projected to increase between 119 percent and 151 percent, Non-Indian agricultural use is projected to decrease between 26.1 percent and 54.5 percent as the Phoenix AMA urbanizes from 2006 through 2025, depending upon the scenario.

Figure 3-3 Phoenix AMA Water Use - Projected 2025



In all three water demand scenarios, municipal uses predominate in the Phoenix AMA in 2025, accounting for 60.7 percent of total water use. Industrial usage is projected to remain relatively constant at 7.3 percent of total water use. Non-Indian agricultural use drops significantly in all scenarios to about 14 percent of total water use while Indian uses are

projected to increase to approximately 18 percent of total water use in the Phoenix AMA for a total agricultural use of 32.0 percent, as shown in Figure 3-3 above.

3.5. Available Water Supplies in the Phoenix AMA

Prior to the availability of CAP water in 1986, surface water (i.e., water from the Salt and Verde rivers) was the primary supply used to meet customer needs in the Phoenix AMA, accounting for 51 percent of supply with groundwater comprising 47 percent of supply and reclaimed water making up the remainder.[15] At that time surface water from the Salt and Verde Rivers was the largest source of renewable supplies.[16]

CAP water deliveries in the Phoenix AMA began in 1986.[17] CAP water use in the Phoenix AMA over the 10-year period 2000-2009 consisted primarily of water used directly for municipal uses (54.7 percent) and CAP water used in lieu of pumping groundwater for agricultural uses (28.4 percent). Significant amounts of CAP water were used directly for agricultural uses (12.3 percent) and to meet Indian water uses (4.0 percent). Small amounts of CAP water, comprising less than 1 percent of total CAP water used, were delivered for industrial uses.[18]

The availability of CAP water in the Phoenix AMA shifted the mix of water supplies. Over the ten-year period, 2000-2009, even though surface water supplies from the Salt and Verde Rivers were significantly reduced from 51% to 33% of total water supplies due to ongoing drought conditions, groundwater use was reduced to 34 percent of total water supplies with CAP water making up 26 percent of the total water supplies[19] (*See* Figure 3-4).[20]

More significantly, as illustrated in Figure 3-4, CAP water use not only made up for reduced Salt and Verde River water supplies but also significantly reduced the use of mined groundwater. Over the ten-year period, 2000-2009, as compared to 1985, groundwater usage decreased by over 250,000 acre-feet annually, a significant 25 percent reduction.

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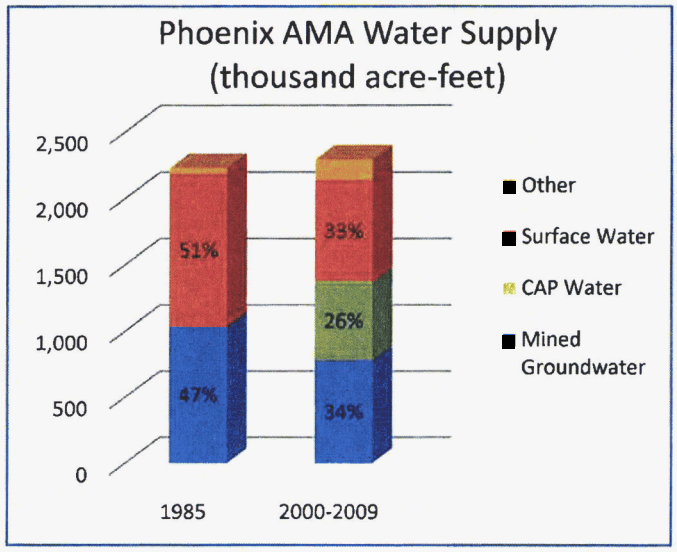
[15] Ibid., 50.
[16] Ibid., 35.
[17] Ibid., 50.
[18] ADWR, *Phoenix AMA Summary Budget,* http://www.azwater.gov/AzDWR/Water Management/Assessments/documents/Phoenix AMA SummaryBudgetOct252010.xls, accessed 3/14/2015.
[19] Includes CAP water used directly and CAP water used in lieu of pumping groundwater.
[20] ADWR, *Phoenix AMA Summary Budget.*

Figure 3-4 Water Supply, Phoenix AMA



3.6. The Future of CAP Water Supplies in the Phoenix AMA

As of 2012, approximately 40 million people in seven western states relied on the Colorado River for water supplies.[21] Despite recently experiencing the worst 14-year drought in the last century, to date there has not been a declared shortage on the Colorado River that has affected CAP water deliveries to Arizona.[22] However, as of February 2015, Lake Mead is at approximately 41 percent of capacity.[23] Water levels at Lake Mead are important because the Bureau of Reclamation uses these water levels to determine whether to declare a shortage in supply and to what degree.

Declared shortages by the Bureau of Reclamation can reduce Colorado River water deliveries to the CAP depending on the severity of the declared shortage. For example, the Bureau of Reclamation has identified three tiers of shortage, Tier 1, Tier 2 and Tier 3, which have a specific effect on Arizona's water supplies from the Colorado River through the CAP. Water users in Arizona who rely on deliveries from the CAP aqueduct incur the majority of any restrictions or reductions in deliveries caused by declared shortages. Appendix A-4 provides greater detail of the process of reducing Colorado River water deliveries to CAP during declared shortages.

If drought conditions persist, Arizona could soon face a reduction of nearly one third of its Colorado River water supply.[24] Longer-term drought conditions could cause more severe reductions to Arizona's CAP water supply. During Tier 1, Tier 2 and Tier 3 declared shortages, water users without a CAP subcontract or with CAP subcontracts with a lower priority than Arizona Water will have CAP water deliveries reduced or even eliminated depending on the

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[21] U.S. Department of the Interior, Bureau of Reclamation, *Colorado River Basin Water Supply and Demand Study: Study Report*, 2012, 2

[22] Ibid., 3

[23] U.S. Department of the Interior, Bureau of Reclamation, *Lower Colorado Water Supply Report*, http://www.usbr.gov/lc/region/g4000/weekly.pdf, accessed 2/10/2015.

[24] U.S. Bureau of Reclamation, Colorado River Basin Water Supply and Demand Study, Study Report, December 2012, 6.

severity of the shortage. Arizona Water's Municipal and Industrial ("M&I") priority subcontract has a high priority and somewhat lesser risk of reduced deliveries except under declared shortages more severe than a Tier 3 shortage. Agricultural users are most affected by declared shortages since they do not have CAP subcontracts and receive Excess CAP water or non-Indian Agricultural priority CAP water, which have a lower priority than M&I priority CAP water.

In addition to the possibility of shortage and reduced deliveries of CAP water, CAP also plans to reduce deliveries to non-Indian Agricultural users in the Phoenix AMA by 25,000 acre-feet per year in 2017, with an additional 25 percent in 2024. After 2030, CAP plans no deliveries to non-Indian Agricultural users. As a result, non-Indian Agricultural users will be forced to pump more groundwater to make up the shortfall caused by planned reductions in CAP water deliveries or any mandatory reductions because of declared shortages on the Colorado River.

3.7. The Future of Groundwater Supplies in the Phoenix AMA

As of June 2015, the AWBA and the CAWCD had 2.52 million acre-feet of CAP water stored in the Phoenix AMA through recharge. In addition, as of June, 2015, ADWR reports that a total of nearly 5.56 million acre feet of CAP water and recycled water have been stored at groundwater savings facilities and underground storage facilities in the Phoenix AMA for the following purposes:

- Assured water supplies
- Recovery during declared shortages
- Indian water settlement purposes
- Southern Nevada's allocation of Colorado River water

Like Arizona Water, AWBA and CAWCD plan to recover stored CAP and Colorado River water for the above-listed purposes by using recovery wells. For example, AWBA's recovery plan projects the need to recover small volumes of water as early as 2017.[25] Additionally, in late 2014 CAP started reaching out to subcontractors, such as Arizona Water, to develop recovery strategy partnerships.[26] Arizona Water could also operate its recovery wells to recover CAP water stored by AWBA of CAWCD as part of its recovery strategy.

[25] Recovery of Water Stored by the AWBA, April 2014
[26] Ibid., 52

4. Conclusion

This 2015 CAP Use Plan identifies and explains how Arizona Water is implementing solutions to water supply uncertainties facing Arizona Water's White Tank service area. According to the Bureau of Reclamation, the likelihood of declared shortages of Colorado River water means that CAP M&I subcontractors like Arizona Water, face the risk of cutbacks and curtailments in CAP deliveries when declared shortages on the Colorado River reduce flows in the CAP aqueduct. At the same time, municipal and industrial water uses will increase as development occurs in the Phoenix AMA.

For these reasons, Arizona Water's 2015 CAP Use Plan carefully examined and analyzed:

- Arizona's public policy of using renewable supplies like CAP water to meet water demands,
- Effects of drought and groundwater overdraft,
- Need to develop a sustainable, renewable, and reliable long-term supply of water,
- Need for a cost-effective and practical way to use CAP water through recharge and recovery facilities, and
- How to make full and beneficial use of Arizona Water's CAP water and minimize the effects on customers' water rates.

As a result of that study, Arizona Water plans to store CAP water in underground storage beginning in 2016 in cooperation with Maricopa Water District and is moving forward to identify a viable underground storage facility site and design and construct the White Tank Recharge and Recovery Facility with the following benefits:

- Implements Arizona's public policy of using renewable CAP water supplies to meet White Tank customers' demands,
- Recharges and recovers CAP water to help mitigate the effects of drought and groundwater overdraft,
- Achieves a renewable, sustainable, and reliable long-term supply of water for White Tank customers,
- Saves $8.6 million in construction costs and $1.6 million in annual operating and maintenance costs compared to the cost of constructing and operating a costly and labor intensive surface water treatment plant and 12-inch water transmission line, and
- Saves the average residential customer $33.30 per month or 77% compared to a costly surface water treatment plant and 12-inch water transmission line.

A-1 Arizona Water Company's Opinion of Probable Construction Cost Estimate

ARIZONA WATER COMPANY

OPINION OF PROBABLE COST
PROPOSED WHITE TANK CENTAL ARIZONA PROJECT
RECHARGE AND RECOVERY FACILITY
FOR THE WHITE TANK WATER SYSTEM

DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	TOTAL
Engineering				
Design/Plan Approvals	1	LS	$ 100,000	$ 100,000
Mob/Demob/Bonds/Insurance/Permits				
Mob/Demob	1	LS	$ 50,000	$ 50,000
Construction Facilities and Temp Controls	1	LS	$ 10,000	$ 10,000
Permits	1	LS	$ 30,000	$ 30,000
Bonds/Insurance	1	LS	$ 20,000	$ 20,000
Site Work				
Clearing and Grubbing	6	AC	$ 2,500	$ 15,000
Basin Excavation and Disposal	30,000	CY	$ 15	$ 450,000
CAP Turnout/Trash Rack/Suction Line	1	LS	$ 100,000	$ 100,000
Grading and Drainage	1	LS	$ 25,000	$ 25,000
Access Drive (6" ABC)	500	CY	$ 100	$ 50,000
Site Fence	2,000	LF	$ 20	$ 40,000
Pump Station				
Pumps (2 duty, 1 stby, 400 gpm each)	1	LS	$ 75,000	$ 75,000
Concrete Slabs	1	LS	$ 10,000	$ 10,000
Electrical and Instrumentation	1	LS	$ 200,000	$ 200,000
Piping and Appurtenances				
Discharge Piping/Transmission Main (12")	200	LF	$ 125	$ 25,000
Valves (12")	3	LF	$ 5,000	$ 15,000
Valves (8")	2	EA	$ 4,000	$ 8,000
Mag Meter (8")	1	EA	$ 10,000	$ 10,000
Overflow Main (18")	200	LF	$ 150	$ 30,000
Flapper Valves	2	EA	$ 5,000	$ 10,000
Micellaeous Appurtences	1	LS	$ 10,000	$ 10,000
Monitoring				
Monitoring Well	1	EA	$ 100,000	$ 100,000
SUBTOTAL				$ 1,383,000
Contractor Overhead and Profit	12	%	$ 1,383,000	$ 165,960
Sales Tax	8	%	$ 1,383,000	$ 110,640
Contingencies	15	%	$ 1,383,000	$ 207,450
SUBTOTAL				$ 484,050
Project Management/Administrative	200	HR	$ 65	$ 13,000
Testing	1	LS	$ 2,500	$ 2,500
Inspections	150	HR	$ 55	$ 8,250
SUBTOTAL				$ 23,750
OPINION OF PROBABLE CONSTRUCTION COST				**$ 1,890,800**
Land Acquisition	6	AC	$ 125,000	$ 750,000
OPINION OF TOTAL PROJECT COST				**$ 2,640,800**

A-2 Operations and Maintenance Cost Estimate

ARIZONA WATER COMPANY

PROPOSED WHITE TANK CENTRAL ARIZONA PROJECT
RECHARGE AND RECOVERY FACILITY
FOR THE WHITE TANK WATER SYSTEM

DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	ANNUAL COST
Trash Rack/Weeds				
Clean Trash Rack/Weed Site	20	MHR	$ 75	$ 1,500
Debris Disposal/Dump Fee	10	TRIP	$ 50	$ 500
Vehicle/Fuel	10	TRIP	$ 100	$ 1,000
Pump Station				
Pump Station/Pipe/Valve Maintenance	40	MHR	$ 75	$ 3,000
Electricity	30,000	kWh	$ 0.12	$ 3,600
Parts	1	LS	$ 2,500	$ 2,500
Vehicle/Fuel	10	TRIP	$ 100	$ 1,000
Basins				
Basin Maintenance	80	MHR	$ 75	$ 6,000
Equipment	12	TRIP	$ 200	$ 2,400
Vehicle/Fuel	10	TRIP	$ 100	$ 1,000
Monitoring				
Monitoring	12	MHR	$ 75	$ 900
Laboratory	1	LS	$ 400	$ 400
Vehicle/Fuel	12	TRIP	$ 100	$ 1,200
OPINION OF PROBABLE ANNUAL O&M COST				**$ 25,000**

A-3 White Tank Recharge and Recovery Facility Cost Savings over Surface Water Treatment Plant

Arizona Water Company
Comparison of Cost and Revenue Requirement
White Tank Recharge and Recovery Project Over Surface Water Treatment Facility

	Surface Water Treatment Plant	White Tank Recharge and Recovery Facility
Utility Plant in Service:		
Land	$ 0	$ 750,000
Wells	0	161,000
Pumping and Treatment Structures and Equipment	0	459,000
Treatment Equipment	4,700,000	1,097,000
Transmission and Distribution Mains	6,500,000	174,000
Total Utility Plant	$ 11,200,000	$ 2,641,000
Accumulated Depreciation	250,770	66,517
Net Utility Plant	$ 10,949,230	$ 2,574,483
Contributions in Aid of Construction	1,075,000	1,075,000
Amortization of CIAC	21,500	21,500
Contributions Net of Amortization	$ 1,053,500	$ 1,053,500
Deferred Taxes	69,031	3,193
Rate Base	$ 9,826,699	$ 1,517,790
Return on Rate Base	8.93%	8.93%
Operating Income Required	$ 877,524	$ 135,539
Gross Revenue Conversion Factor	1.63770	1.63770
Revenue Required - Rate Base	$ 1,437,121	$ 221,972
Purchased Water Cost	189,728	189,728
Operation and Maintenance Cost	205,216	25,000
Depreciation and Amortization	229,270	45,017
Total Revenue Required on Investment	$ 2,061,335	$ 481,717
Operating Revenue - White Tank	$ 2,478,781	$ 2,478,781
Average Monthly Residential Bill	$ 52.20	$ 52.20
Monthly Revenue Requirement per Average Residential Customer	$ 43.43	$ 10.13
Monthly Customer Savings		$ 33.30
Percentage of Monthly Customer Savings		77%

A-4 CAP Issue Brief, October 2014, Colorado River Shortage

CAP | Issue Brief

CENTRAL ARIZONA PROJECT | Strategic Initiatives & Public Policy

October 2014

COLORADO RIVER SHORTAGE

Based on current hydrologic conditions, there is a significant probability of an official declaration of shortage in the Colorado River water supply starting as early as 2016 or shortly after. Under shortage conditions the Central Arizona Project (CAP) will be subject to reductions in Colorado River water because CAP holds a "junior" priority[1] water entitlement to Colorado River water among the Lower Basin states (Arizona, California, and Nevada). Other low priority Colorado River contractors in Arizona, such as the Mohave County Water Authority, may also be subject to reductions during times of shortage. To prepare for possible shortage and to guide Colorado River operations during low reservoir conditions, the seven Colorado River Basin states and the Bureau of Reclamation (BOR) completed an agreement in 2007 ("Shortage Sharing Guidelines") identifying steps to be taken should a water shortage situation arise. In addition, CAP has worked with the Arizona Water Banking Authority to store excess CAP water underground. This stored water will be made available to protect municipal and industrial users from suffering reduced supplies during shortages and to meet Arizona's obligations pursuant to Indian Water Rights Settlements.

What is Shortage?

Each year, the Secretary of the Interior determines the status of the Colorado River water supply for the Lower Basin States in terms of it being in a Normal, Surplus, or Shortage condition. A Shortage condition is defined as "...insufficient mainstream water is available to satisfy 7.5 million acre-feet (maf)[2] of annual consumptive use in the Lower Division states." The Shortage Sharing Guidelines outline how and when the Secretary makes the annual water supply determination. The key factor for water supply determination is the amount of storage (as measured by water elevation) in Lake Mead. To date, a shortage has never been declared. There are a series of conditions and steps that must occur before a Shortage declaration would be made, including Lake Mead's water elevation falling below 1,075 feet.

Lake Powell and Lake Mead

Lake Mead releases water to meet water deliveries in Arizona, California, Nevada, and Mexico, while Lake Powell is operated to help the Upper Basin meet its obligations to deliver water to the Lower Basin. As part of the Shortage Sharing Guidelines, water levels in these two reservoirs are now coordinated to allow better management of the Colorado River supply. Four factors impact the water levels in Lakes Powell and Mead:

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[1] The "Law of the River," interlocking Federal and State laws, inter-State compacts, court decrees, contracts, and international treaties, defined Arizona and CAP water priority. Arizona's total entitlement to Colorado River water is 2.8 million acre-foot (maf); CAP's share has junior priority status.

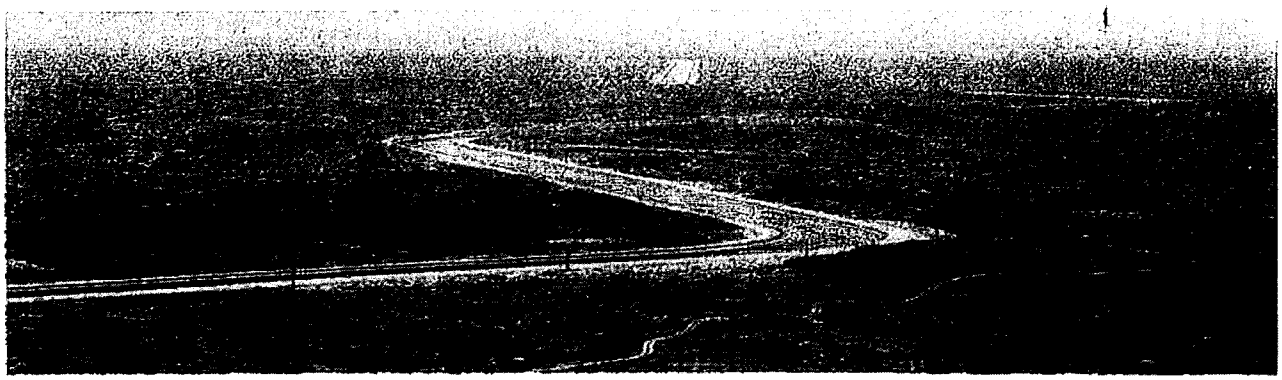
[2] An acre-foot is the amount of water it takes to cover an acre of land with one foot of water; about 326,000 gallons.

1. The uses in the Upper Basin States[3] - currently, these four states use about 60% of their entitlement to Colorado River water. The unused water flows to Lake Powell.
2. The hydrology of the Colorado River, such as the amount of precipitation that falls within the basin and the resulting runoff that flows into the river and reaches the reservoirs.
3. Colorado River reservoir operations.
4. Lower Basin uses and the structural deficit. The Lower Basin States and Mexico are currently using 100% of their entitlements[4]. These uses are larger than the normal inflow into Lake Mead resulting in an annual reduction in storage (structural deficit) within the reservoir.

One goal of the 2007 agreement is to balance storage between Lakes Powell and Mead. The idea is for the reservoirs to rise together in the event of wet conditions and, in the case of normal or dry conditions, fall together. This approach shares the water supply opportunities and risks among the Upper and Lower Basin States. The agreement creates a formula in which additional water in Lake Powell must be transferred to Lake Mead when Mead levels run low. When storage is roughly equal, the minimum required amount is released from Powell to Mead. When Powell has more storage than Mead, some additional water above the minimum requirement is transferred from Powell to Mead.

How would Arizonans be impacted if a shortage were declared?

If a shortage is declared by the Secretary of the Interior, most Arizonans will not notice any impact to their daily lives. Arizona has an entitlement to 2.8 maf of Colorado River water - including both water ordered by CAP contract holders and "excess" water delivered to other users and for recharge[5]. CAP uses about 1.6 maf of Arizona's entitlement every year. The senior water right users, who are mostly located along the Colorado River and within the Yuma area, would not have their supply reduced. While CAP holds a junior priority within Arizona and will be subject to shortages, CAP would manage a shortage by first reducing the excess water deliveries and ceasing portions of its recharge operations. Second, CAP would limit its water delivery to agricultural customers, who have limited rights to CAP water and could turn to pumping groundwater or other sources. If reductions are required beyond this level, then CAP would begin to recover CAP water stored underground. This would be done to protect existing municipal and industrial CAP customers from experiencing reductions in deliveries of CAP water and to recover water stored to meet Arizona's obligations pursuant to Indian Water Rights Settlements. A graphical depiction of how Colorado River water users, including CAP, would be impacted by various levels of shortage is provided in the last page of this document.



[3] The Upper Basin States are Colorado, New Mexico, Utah, and Wyoming.

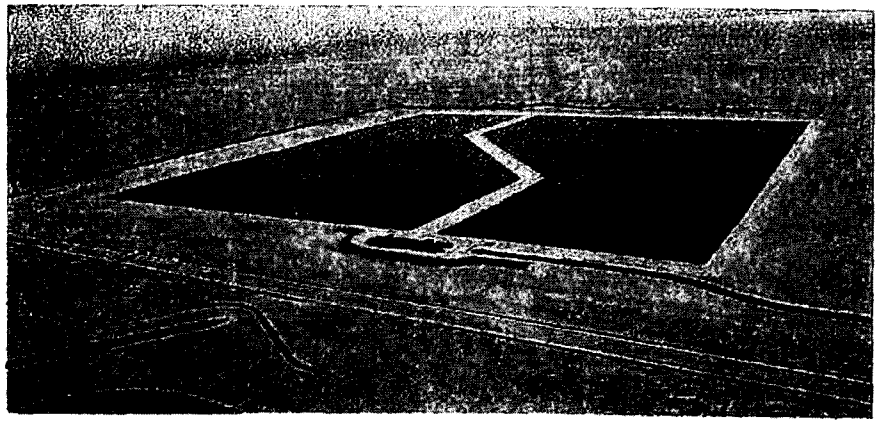
[4] The Lower Basin States of California, Arizona, and Nevada have annual Colorado River entitlements for 4.4, 2.8, and 0.3 maf respectively. Mexico has an annual entitlement of 1.5 maf.

[5] Excess CAP water is CAP water that is not ordered by long-term CAP contractors and any unused portion of Arizona's Colorado River entitlement delivered through the CAP system.

Other Shortage Solutions

Water professionals throughout Arizona and the seven Basin States have spent many years managing this issue. The CAP has taken part in programs that work toward making our water supply system more resilient to changes in climate and variable water levels. Some examples are:

- CAP, in partnership with Lower Basin water agencies, funded the construction of a new off-stream reservoir – Brock Reservoir[6] (see figure below) to reduce losses from water that is ordered but not diverted by Colorado River users.
- CAP is working on increasing runoff by participating in cloud seeding in Colorado, Wyoming, and Utah, and improving vegetation management along the River.
- CAP, BOR, and the Basin States reached an agreement, through Minute 318[7], with Mexico to allow Mexico to store up to 260,000 af in Lake Mead until the 2010 earthquake damage to irrigation infrastructure in Mexico can be repaired and Mexican agricultural users can effectively use their full entitlement. The additional storage could reduce the likelihood of a shortage declaration in the near term.
- CAP along with BOR and the Basin States, through Minute 319[7], reached an agreement with Mexico wherein Mexico would accept reductions in its deliveries during shortage periods in the Lower Basin.
- CAP, BOR, Southern Nevada Water Authority, and Metropolitan Water District of Southern California, are funding partners through Minute 319[7] for a conservation project. Through this project, Mexico is expected to conserve 124,000 af, creating additional storage in Lake Mead.
- CAP, with other Colorado River partners, is developing a Drought Response Plan to mitigate the impacts of a shortage in the Lower Colorado River Basin and to address the existing imbalance between supply and demand (structural deficit).
- CAP, in partnership with water agencies in the Colorado River Basin and BOR, has funded the System Conservation Agreement and the Innovative Conservation Agreement. Both agreements provide funds for fallowing activities and new conservation technology within the basin, respectively.
- CAP, in partnership with irrigation districts in central Arizona, has created an Agricultural Forbearance Program. Under the program, CAP provides incentives for the irrigation districts to reduce their use of CAP water. The conserved CAP water will be stored in Lake Mead, with the goal of attempting to reduce the probability of Colorado River shortages.



[6] The Warren H.Brock (formerly Drop 2) Reservoir was completed in October 2010 and is currently operational. The reservoir is located in California, along the All American Canal, near El Centro.

[7] Minute 318 and Minute 319 are addendums to the 1944 U.S./Mexico Treaty

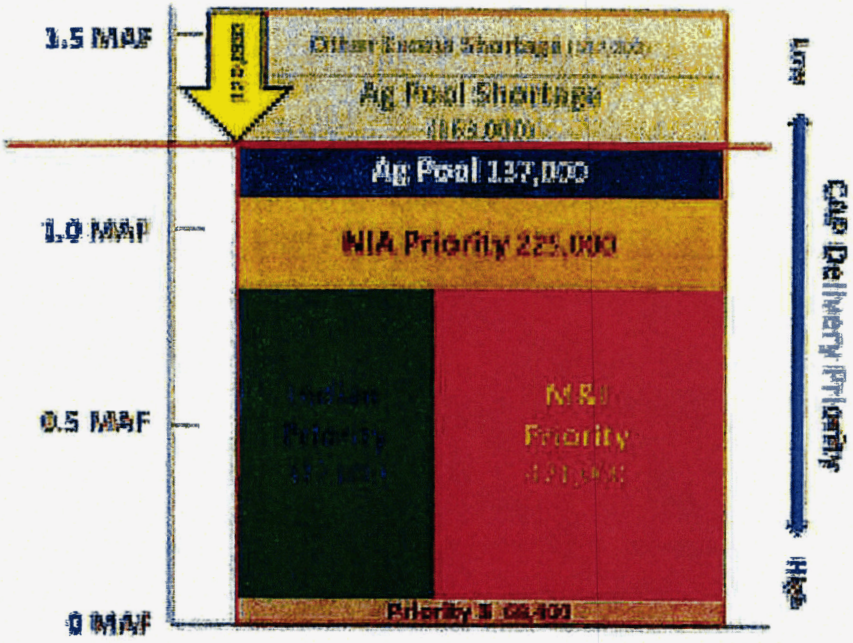
Colorado River Shortage Process:

1. Shortage Notice

2. Shortage Sharing: There are 3 tiers of shortage reductions triggered by water elevations in Lake Mead. Arizona bears the brunt of the reductions; with CAP taking most of the reductions.

Entity	Tier 1 (1,075')	Tier 2 (1,050')	Tier 3 (1,025')
CAP[2]	Up to 320,000 af	Up to 400,000 af	Up to 480,000 af
Other Arizona[3]	0 to 32,000 af	0 to 40,000 af	0 to 48,000 af
Nevada	13,000 af	17,000 af	20,000 af
Mexico[4]	50,000 af	70,000 af	125,000 af

3. Shortage Reductions to CAP Pools (based on a 2017 shortage)



Notes:
1. USBR provides 24-month water forecasts, updated monthly.
2. CAP's portion of shortage is related to water uses by other Arizona "on-river" users, which varies annually.
3. Other Arizona water users' portion of shortage is based on their annual water usage.
4. Mexico's share of shortage is subject to Minute 319.

For more information, please contact the Central Arizona Project's Strategic Initiatives & Public Policy Office at 623-869-2150.