ORIGINAL NEW APPLICATION

0000122316

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Arizona Corporation Commission
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BEFORE THE ARIZONA CORPORATION COMMISSION

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.	W-01445A-10-0517 DOCKET NO. W-01445A-10-_____ **APPLICATION**

Arizona Water Company, an Arizona corporation (the "Company"), hereby applies for an order approving certain adjustments to its rates and charges for utility service provided by the Company's Western Group water systems in Arizona, and in support thereof, states as follows:

1. The Company is an Arizona corporation engaged in providing water for public purposes in portions of Cochise, Coconino, Gila, Maricopa, Navajo, Pima, Pinal, and Yavapai Counties, Arizona, pursuant to certificates of public convenience and necessity granted by the Arizona Corporation Commission (the "Commission"). At the present time, the Company operates 19 water systems that serve approximately 84,000 customers.

2. The Company's central business office is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351. Its mailing address is Post Office Box 29006, Phoenix,

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PART 1 OF 8
BAR CODE # 0000122316

To review remaining parts please see the following:

PART 2 OF 8 BAR CODED #0000122317
PART 3 OF 8 BAR CODED #0000122318
PART 4 OF 8 BAR CODED #0000122319
PART 5 OF 8 BAR CODED #0000122320
PART 6 OF 8 BAR CODED #0000122321
PART 7 OF 8 BAR CODED #0000122322
PART 8 OF 8 BAR CODED #0000112323

Arizona 85038-9006, and its telephone number is (602) 240-6860. The Company's President and primary management contact is William M. Garfield, who is responsible for supervising the day-to-day operations of the Company.

3. The person responsible for overseeing and directing the conduct of this rate application is Joseph D. Harris, the Company's Vice President and Treasurer. Mr. Harris' office and mailing addresses are the same as those set forth in the previous paragraph. Mr. Harris' telephone number is (602) 240-6860, Ext. 170; his facsimile number is (602) 240-6874; his e-mail address is jharris@azwater.com. All discovery, data requests, and similar requests for information concerning this Application should be directed to Mr. Harris.

4. In this Application, the Company seeks adjustments to its rates and charges for utility service for the Company's Western Group systems, which includes the Pinal Valley (Casa Grande, Coolidge and Stanfield), Ajo and White Tank water systems. Together, the Company's Western Group water systems served approximately 30,400 customers at the end of the test year (December 31, 2009) used in this application. The Commission has previously authorized the Company to implement and utilize a "group concept" for filing rate applications in order to, among other things, simplify processing of the application and increase administrative efficiency. See Decision No. 58120 at 33-34 and 39. See also Procedural Order (August 1, 1995) issued in Docket No. U-1445-91-227.

5. The last Company rate case was filed in 2008, processed on a total company basis, and decided in Decision No. 71845 (August 25, 2010). The test year used in that proceeding was the 12-month period ending December 31, 2007. The Company's last rate case involving only its Western Group systems was filed in 2004 and decided in Decision No. 68302 (November 14, 2005), using a test year of the 12-month period ending December 31, 2003.

6. Revenues from the Company's utility operations are presently inadequate to allow the Company to recover its operating costs and provide a just and reasonable rate of return on the fair value of its utility plant and property used to provide service to its Western Group customers. Since 2007, the test year in the Company's most recent rate proceeding, the Company has

designed, constructed, and placed into service significant additions to utility plant in order to assure safe and reliable water service to its customers and, in particular, to comply with the Commission's directive to reduce water losses by July 1, 2011. As a result, the Company's rate base has increased substantially. Accordingly, the Company requests that certain adjustments to its rates and charges for utility service rendered by its Western Group water systems be approved by the Commission so that the Company can recover the costs of providing water service to its customers and earn a just and reasonable rate of return on the fair value of its utility plant and property.

7. Filed herewith as a separately bound exhibit are the schedules required pursuant to A.A.C. R14-2-103 for rate applications by Class A water utilities. The test year utilized by the Company in connection with the preparation of such schedules is the 12-month period that ended December 31, 2009. It is also the most recent 12-month period for which audited financial statements are available. The Company requests that the Commission utilize such test year in connection with this Application, with appropriate adjustments for utility plant additions that have been completed and placed in service in the Western Group water systems as detailed in said schedules, and appropriate adjustments for known and measurable changes in the Company's operating expenses since December 31, 2009 to obtain a normal or more realistic relationship between revenues, expenses and rate base during the period rates will be in effect. The Company stipulates that the Commission may use its original cost rate base as its fair value rate base for the limited purpose of setting rates in this proceeding.[1]

8. During the test year, the Company's Western Group had adjusted gross revenues of \$19,053,061, adjusted operating income of \$2,415,356 and adjusted net income of \$490,886. The Company's adjusted original cost rate base for the Western Group water systems was \$57,714,878. Thus, the rate of return on original cost rate base for the Western Group water systems for the adjusted test year was only 4.18%. The Company submits that this rate of return is inadequate to allow the Company to service its debt, maintain a sound credit rating, and enable

[1] In so stipulating, the Company does <u>not</u> intend to imply that the value of its utility plant, property and other rights is equal to its original cost rate base in other contexts or for other purposes.

the Company to attract additional capital on reasonable and acceptable terms in order to continue necessary investment in utility plant to adequately serve its customers.

9. The Company is requesting an increase in revenues for the Western Group equal to $5,097,223, which constitutes an increase of 26.75%. The proposed adjustment to the Company's rates and charges is designed to produce a rate of return on the original cost rate base equal to 9.52%.

10. In Decision No. 64302 (Nov. 14, 2005), the Commission approved an Arsenic Cost Recovery Mechanism ("ACRM") for the Company's Western Group water systems. For reasons described in the Direct Testimony of Fredrick Schneider, the Company must construct additional arsenic treatment plants in the Pinal Valley water system. Planning and design for those plants is underway. In Decision No. 71845, the Commission authorized the Company to make new ACRM filings for arsenic treatment plants that were planned for construction in its Sedona and Superstition water systems. The Company is proposing that the authorization granted in Decision No. 71845 be extended to the Western Group in this proceeding.

11. In Decision No. 71845, the Commission also approved consolidation of the Casa Grande, Coolidge and Stanfield water systems. In addition, the Company was ordered to prepare a study outlining consolidation proposals for its remaining systems, including impacts to customers and timelines for implementation. The Company filed the consolidation study in Docket No. W-01445A-08-0440 on September 30, 2010. Consistent with that study, the Company is now proposing to consolidate the White Tank water system with the Pinal Valley water system.

12. In Decision No. 68302 (Nov. 14, 2005), the Commission approved a Central Arizona Project ("CAP") Hook-Up Fee for the Pinal Valley (Casa Grande and Coolidge) and White Tank water systems for the purpose of recovering on-going and deferred CAP municipal and industrial capital costs. In Decision No. 71845, the Commission authorized the Company to continue collection of the CAP Hook-Up Fees until its next Western Group rate case or December 31, 2012, whichever comes first. As detailed in the Direct Testimony of Joel M. Reiker, the

Company is requesting in this case, that the Commission authorize the Company to continue collecting the present CAP Hook-Up Fees, and that they be consolidated into a single fee consistent with the Company's request to consolidate water rates for the Pinal Valley and White Tank water systems.

13. In addition to its request to continue the CAP Hook-Up Fees and ACRM for the Western Group systems, the Company, in order to restore and then maintain its financial ability to provide an adequate level of water service to its Western Group water system customers, is requesting authorization to implement a Distribution System Improvement Charge ("DSIC") for its Western Group water systems. The DSIC is a ratemaking tool that allows utilities to recover the fixed costs (depreciation and rate of return) of non-revenue producing distribution system improvement projects completed between rate cases. In Decision No. 71845, the Commission stated that an infrastructure funding mechanism, or DSIC, may be a reasonable way to proceed with orderly replacement of the Company's aging infrastructure. The Commission also stated its belief that it was appropriate for the Company to further develop this issue for future consideration by preparing and filing a DSIC study, and to utilize the information from that study to inform the Commission of further proposals in its future rate cases. An initial form of the DSIC study is being filed as part of this application as an exhibit to the Direct Testimony of Joseph D. Harris; the initial form of the DSIC Study and Mr. Harris' testimony provide the specific details of the Company's DSIC proposal.

14. In addition to its ACRM and CAP Hook-Up Fees continuation and the DSIC proposal, the Company is requesting authorization to implement an Off-Site Facilities Fee. The purpose of the Off-Site Facilities Fee is to equitably apportion the costs of constructing additional off-site facilities to provide water production, treatment, delivery, storage and pressure facilities among all new customers whose water supply requirements make these facilities necessary. A $3,500 fee would be established for each new service connection with a 5/8 x 3/4-inch meter, and the fee would be graduated in amount for larger meter sizes. The fee would be applicable to all

new service connections in the service area, as further detailed in the Direct Testimony of Mr. Harris.

15. Filed concurrently in support of this Application is the Direct Testimony of the following persons: William M. Garfield, Joseph D. Harris, Fredrick K. Schneider, Joel M. Reiker, and Thomas M. Zepp. Brief summaries of the testimony are provided at the beginning of each witness's testimony. This direct testimony is contained in a separately-bound volume filed concurrently with this Application. In addition, to assist the Utilities Division in evaluating this Application and to minimize discovery, the Company has provided the Utilities Division with copies of the Company's bill analysis.

WHEREFORE, the Company requests the following relief:

A. That the Commission, upon proper notice and at the earliest possible time, approve permanent adjustments to the rates and charges for water service provided by the Company's Western Group water systems, as proposed by the Company herein, or approve such other rates and charges as will produce a just and reasonable rate of return on the fair value of the Company's utility plant and property;

B. That the Commission authorize the Company to continue in place its CAP Hook-Up Fees, ACRM, and MAP Surcharge, as previously approved for its Western Group water systems;

C. That the Commission authorize the Company to implement a DSIC for the Western Group water systems.

D. That the Commission authorize the Company to implement an Off-Site Facilities Fee for the Western Group water systems.

E. That the Commission authorize such other and further relief as may be appropriate to ensure that the Company has an opportunity to earn a just and reasonable return on the fair value of its utility plant and property and as may otherwise be required under Arizona law.

RESPECTFULLY SUBMITTED this 29th day of December, 2010.

ARIZONA WATER COMPANY

By: Robert W. Geake

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An original and thirteen (13) copies of the foregoing, together with the separately bound schedules and direct testimony supporting this Application, were delivered this 29th day of December, 2010 to:

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

A copy of the foregoing together with the separately bound schedules and direct testimony supporting this Application, were delivered this 29th day of December, 2010 to:

Ms. Lyn Farmer
Chief Administrative Law Judge
Hearing Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Mr. Steve Olea, Director
Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Ms. Janice Alward, Chief Counsel
Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

By: Robert Geake

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

W-01445A-10-0517

2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

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2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

OF

William M. Garfield

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ARIZONA WATER COMPANY

Direct Testimony of

William M. Garfield

I. Introduction and Qualifications

Q. PLEASE STATE YOUR NAME, EMPLOYER AND OCCUPATION?

A. My name is William M. Garfield. I am employed by Arizona Water Company (the "Company") as its President and Chief Operating Officer ("COO"). As such I am responsible for setting the goals for each of the Company's various departments and conduct regular meetings with department heads to ensure that work is completed in accordance with these goals. I also work closely with the Company's Vice President and General Counsel to ensure that all work and activities comply with all legal requirements. I report directly to the Company's Chief Executive Officer.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE, EDUCATIONAL BACKGROUND AND PROFESSIONAL AFFILIATIONS.

A. Since my initial employment with the Company in February 1984, I have held the positions of Engineer, Senior Engineer, Operations Manager, Vice President of Operations and currently hold the position of President and COO, which I have held since July 18, 2003.

I completed my undergraduate studies at Southern Illinois University at Carbondale and received a Bachelor of Science degree with honors in Thermal and Environmental Engineering. I have taken post-graduate coursework at Arizona State University in Civil Engineering, including coursework in hydrology, water and wastewater treatment and statistics. I am a member of Tau Beta Pi, a national honorary engineering society.

I am a member of the American Water Works Association ("AWWA"), the Arizona Water Association and serve on the American Water Works Association's Water Meter Standards Committee. I have been active in numerous water industry stakeholder groups with the Arizona Department of Environmental Quality ("ADEQ"), the Arizona Department of Water Resources ("ADWR") and the Central Arizona Groundwater Replenishment District and am an ADEQ certified water distribution system and water treatment plant operator. I serve on the Company's Board of Directors, the Board of Directors of the Water Infrastructure Finance Authority of Arizona and the Board of Directors of the Water Utilities Association of Arizona ("WUAA") as well as serving as WUAA's Treasurer. I also serve as Chairman of the Water Management Subcommittee of the Pinal Active Management Area Groundwater User Advisory Council. In addition, I am a member of the Statewide Water Advisory Group, serve on the Arizona Water Institute's External Advisory Board and have been an active member of the Economic Working Group of the Blue Ribbon Panel on Sustainability, a panel formed to address water sustainability which was jointly chaired by the Arizona Corporation Commission (the "Commission"), ADWR and ADEQ.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY FOR THE COMPANY IN ANY OF ITS RATE APPLICATIONS AT THE COMMISSION?

A. Yes. I have testified in the Company's last four rate application proceedings, which were for the Company's Northern, Eastern and Western Groups and the total Company.[1]

Q. WHAT IS THE PURPOSE AND EXTENT OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to provide, discuss or describe: a) A summary of direct testimony and general background of the Company's rate application; b) An

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[1] *See* Docket Nos. W-0445A-00-0962, W-01445A-02-0619, W-01445A-04-0650 and W-01445A-08-0440.

overview of the Company's obligation to provide safe, reliable and adequate water service; c) The status of aging infrastructure in the Company's Western Group water systems; d) The factors affecting the Company's ability to reduce water losses; e) The cost to replace aging infrastructure and thereby reduce water losses; f) The appropriateness of instituting a Distribution System Improvement Charge("DSIC"); g) An overview of the need to continue the Company's consolidation plan; h) An overview of the success of the Arsenic Cost Recovery Mechanism ("ACRM")and the need to continue the ACRM; i) An overview of conservation efforts and Best Management Practices ("BMPs") and the need to fund BMPs; j) The need for an Off-Site Facilities Fee; and k) The need to continue Central Arizona Project ("CAP") hook-up fees.

II. Summary of Testimony and General Background of Application

Q. PLEASE SUMMARIZE THE COMPANY'S RATE APPLICATION.

A. The Company is requesting an increase in utility revenues of $5,097,223 over current rates to enable the Company to recover its cost of providing water utility service. This increase in utility revenues is required due to increased costs of providing utility service, increases in utility plant investment and the overall increase in the cost of capital since the Company's last rate decision and is due, in part, to declining water sales.

The Company must comply with safe drinking water standards and fulfill its obligation to provide safe, reliable and adequate water service to its customers. Also, in Decision No. 71845, the Company's most recent rate decision ("Decision No. 71845"), the Commission ordered the Company to reduce non-account water (i.e., water losses) to less than ten percent for all of its water systems, including its Western Group water systems. The Company may be unable to fully comply with these requirements and regulations due to the effects of aging infrastructure and the inability to timely recover the costs associated with the replacement or repair of such infrastructure. The Commission has already established an effective way to fund certain capital-intensive infrastructure projects needed to comply with safe drinking water standards through its approval and adoption of an ACRM. Therefore, consistent with the basis for establishing an ACRM, the Company is requesting that the Commission approve and authorize the establishment of a Distribution System Improvement Charge ("DSIC") for the Company's Pinal Valley Water System ("PVWS" or "Pinal Valley").

The Commission's public policy on water losses is clear – manage and control water loss and reduce water loss when it is too high. The Company has identified several main replacement projects needed to move towards compliance with the Commission's order to reduce water loss. To this end, the Company has installed, or will install, replacements of aging and leaking infrastructure in its PVWS. Some of this construction work was completed after the end of the test year. Because there is strong public policy supporting the installation of infrastructure needed to comply with safety, reliability and adequacy standards, the Company is requesting that the Commission allow this utility plant to be included in rate base as part of a 2009 Test Year in this proceeding.

In Decision No. 71845, the Commission approved the Company's proposal to consolidate several water systems and concluded in Statement of Fact Number 72 that the Company's rate consolidation proposal was just and reasonable. The Commission further ordered the Company to prepare a study on rate consolidation ("Consolidation Study") and to use the results of that study in its future rate cases, such as this case. In accordance with the Company's consolidation plan adopted by the Commission in Decision No. 71845 and with the Company's Consolidation Study, the Company is requesting that the Commission approve the first step in a phased consolidation of the PVWS and White Tank water system, and to continue with the next step of the consolidation of the Stanfield water system with the PVWS.

The Company is also requesting that the Commission continue the ACRM for the Company's Western Group, as the ACRM has proven to be an effective method of facilitating the construction of water treatment plants for reduction of arsenic in the water supply. The PVWS requires expansion of an existing water treatment plant and construction of a new water treatment plant due to sharply rising arsenic levels that do not comply with the arsenic safe drinking water standard.[2]

In Decision No. 71845, the Commission also ordered the Company to implement a certain number of BMPs for each water system, including its Western Group water systems. On December 22, 2010, the Company submitted its list of BMP tariffs to the Commission for its consideration in Docket No. W-01445A-08-0440 and has also requested recovery of the costs of implementing these BMPs. The Company requests that the increased cost of implementing these BMPs be authorized and approved for cost recovery in this proceeding. Mr. Reiker addresses the recovery of the cost of these BMPs in his direct testimony.[3] Having adequate funding would help mitigate the cost of implementing these BMPs.

The Company is also requesting that the Commission approve the establishment of an Off-Site Facilities Fee for the PVWS and authorize the continuation of the CAP Hook-Up Fees for its Pinal Valley and White Tank water systems.

III. <u>Overview of the Company's Obligation to Provide Safe, Reliable and Adequate Water Service</u>

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[2] *See* Mr. Schneider's direct testimony
[3] *See* Mr. Reiker's direct testimony, Pg. 21

Q. WHAT ARE THE COMPANY'S OBLIGATIONS AS A PUBLIC SERVICE CORPORATION?

A. As a public service corporation, the Company is obligated by Arizona Revised Statutes ("A.R.S.") §40-361 to provide service and facilities that are adequate, efficient and reasonable and that promote safety, health, comfort and convenience. The Commission is empowered by the Arizona Constitution to establish rules and regulations to ensure that service is safe, reliable and adequate. In exchange for the exclusive right to provide public utility service, the Commission allows a public service corporation to charge rates that are just and reasonable. A just and reasonable rate is one that allows the Company an opportunity to recover its cost of service.

Q. WHAT RESPONSIBILITY DOES THE COMMISSION PLACE ON PUBLIC SERVICE CORPORATIONS TO PROVIDE SAFE, ADEQUATE AND RELIABLE SERVICE?

A. The Commission requires public service corporations to comply with safety, adequacy and reliability standards. Beginning with the initial application for a Certificate of Convenience and Necessity ("CCN"), a public service corporation must not only demonstrate to the Commission that it is ready, willing and able to serve, but also that the water it serves complies with safe drinking water standards.

Q. BESIDES THE COMMISSION, IS THE COMPANY REGULATED BY ANY OTHER ENTITY OR AGENCY CONCERNING THE SAFETY, ADEQUACY OR RELIABILITY OF SERVICE?

A. Yes. The Company is also regulated by the U.S. Environmental Protection Agency ("EPA"), ADEQ and ADWR. The EPA and ADEQ regulate the safety and quality of the water that the Company provides under the safe drinking water standards established by the federal Safe Drinking Water Act. In addition to safe drinking water standards, ADEQ has established capacity, technical and managerial capability standards for public water systems and regulations for the water distribution system and water treatment plant operators of such systems. ADWR regulates the Company's efforts concerning water conservation and water use and requires the demonstration of supply adequacy through its Assured and Adequate Water Supply Programs.

Q. WHAT DO CUSTOMERS EXPECT FROM THEIR WATER SERVICE PROVIDER?

A. Safe, reliable and adequate water service at just and reasonable rates.

Q. WHAT CUSTOMER IMPACTS RESULT FROM UNRELIABLE OR INADEQUATE WATER SERVICE?

A. Among other impacts, interruptions in water service, low water pressure, and reduced fire flows can result from unreliable or inadequate water service. However, unreliable and inadequate water service can also adversely affect property values and the day-to-day lives of customers. Since water is a consumable commodity, the very health of the customer may be affected by the quality of the water provided. Disruptions in service can result in increased public safety risks when fire flows are not available. In addition, since water is also needed to support businesses, lack of supply or disruptions in water service can affect a customer's ability to work or earn a living.

Q. WITH REGARD TO THE CURRENT RATE APPLICATION, WHAT FACTORS AFFECT THE COMPANY'S ABILITY TO PROVIDE RELIABLE AND ADEQUATE WATER SERVICE?

A. Many factors can affect the Company's ability to provide reliable and adequate water service. One of the most important factors that can affect the Company's ability is its financial capability. Without adequate financial resources, the Company cannot fund the improvements or replacements needed to provide reliable and adequate water service. Utility infrastructure has a limited life and must eventually be replaced at the Company's own expense, whether such infrastructure was funded initially by contributions, refundable advances, or by the utility. In fact, the scope of this issue is so large that the EPA has identified that hundreds of billions of dollars in capital investments are needed to fund aging infrastructure in recent national surveys. [4]

The Company's utility plant accounts show that water distribution and transmission mains account for over seventy percent of its utility infrastructure. In addition, as an industry, water utilities are much more capital intensive than other regulated utilities. A recent report by the National Association of Water Companies and State Public Utility Commission shows that utility plant for water utilities at $3.35 per dollar of revenue is much higher than the utility plant per dollar of revenue for electric, gas and telephone utilities, which were shown respectively at $1.67, $1.13 and $0.88 of utility plant per dollar of revenue.[5] The Company has an even higher level of utility plant totaling approximately $7.50 of utility plant per dollar of operating revenue, based on year-end original cost utility plant of $387,582,097 and operating revenues of $51,429,832 as shown in the Company's 2009 annual report filed with the Commission.[6]

Even after the Company's efforts to maintain and operate its water distribution systems through prudent management efforts, its water distribution systems (i.e., its water system infrastructure) are reaching, or have reached, a point where maintaining certain portions of those systems is not cost-effective and replacement of major portions of the water distribution system is necessary. As water distribution systems age, they become less reliable and present certain safety concerns as well. Every water distribution system main break or major leak

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[4] *See* Exhibit WMG-1.
[5] *See* Exhibit WMG-2
[6] *See* Exhibit WMG-3

disrupts service. Water quality and safety can also be adversely affected by the frequency of water distribution system main breaks. Even with the Company's strong commitment to provide safe, reliable and adequate water service, the necessary solution extends beyond management efforts alone.

In Decision No. 71845, the Commission concluded that reducing water loss is an important public policy objective. The Company has analyzed and assessed its Pinal Valley and Coolidge Airport water systems and concluded that management efforts alone cannot achieve this public policy objective and the Company must accelerate the replacement of aging infrastructure in the Pinal Valley and Coolidge Airport water systems.[7]

Q. WHAT DO YOU MEAN BY THE TERM "MANAGEMENT EFFORTS"?

A. When I use the term "management efforts," I am referring to methods of operation and maintenance (i.e., monitoring system pressure) in addition to repair – and prudent operation of existing infrastructure in a manner intended to prolong its useful life. Ultimately, infrastructure reaches the point where it can no longer be effectively repaired and must be replaced.

IV. Aging Infrastructure

Q. ARE THE PROBLEMS WITH AGING INFRASTRUCTURE EXPERIENCED IN ARIZONA?

A. Yes. While the symptoms of aging infrastructure were initially evident in the older areas of the United States, they are becoming increasingly evident in Arizona and other parts of the Southwest. In fact, the Company has experienced the effects of aging infrastructure in many of its oldest water systems, such as its Pinal Valley and Coolidge Airport water systems. Unfortunately, the Company is unable to fund the level of infrastructure replacement necessary to maintain adequate and

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[7] *See* Mr. Schneider's direct testimony and related exhibits.

reliable water service since its income is insufficient to support any additional debt.[8]

Q. CAN YOU EXPLAIN WHAT THE TERM "AGING INFRASTRUCTURE" MEANS AND WHY THE COMMISSION SHOULD BE CONCERNED WITH IT IN THIS CASE?

A. Aging infrastructure refers to the physical decline or degradation of utility plant facilities caused by corrosion, wearing out of equipment, age-related reduction in capacity and other effects of aging. Aging infrastructure is a particularly serious problem facing the Company because of the Company's inability to accumulate or obtain capital to fund replacement infrastructure and has led to increasing frequencies of water main and service line leaks and breaks, increasing water losses. The Commission already has expressed grave concerns about increasing water losses and increasing frequencies of water distribution main and service line leaks and breaks in the PVWS, all of which are caused by the effects of the aging water transmission and distribution system. Without the ability to accumulate or obtain capital to fund needed water transmission and distribution system replacements, water losses will continue to increase.

Q. WHAT ARE SOME PHYSICAL SIGNS OF AGING INFRASTRUCTURE?

A. Increased frequency or occurrence of water main and service line leaks and breaks, increasing water losses, discolored water, decreased pressure and increasing numbers of disruptions in water service are all signs of aging infrastructure.[9]

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[8] *See* Mr. Harris' direct testimony at pages 7-8.

[9] *See* Mr. Schneider's direct testimony and related exhibits.

Q. HOW DOES THE COMPANY KNOW WHEN ANY PART OF ITS TRANSMISSION AND DISTRIBUTION SYSTEM NEEDS TO BE REHABILITATED OR REPLACED?

A. Water main breaks and pipe leakage increase. To keep up with an increasing number of leaks and breaks, and to control water losses, the Company has increased its management efforts to detect, locate and repair leaks in its water distribution system. When this is either no longer a feasible or cost-effective response, replacement becomes necessary. Mr. Schneider provides additional testimony on the specific symptoms of aging infrastructure, water losses, and how the Company knows when any part of its transmission or water distribution system needs to be rehabilitated or replaced.

Q. HOW WOULD YOU CATEGORIZE THE AGE OF WATER SYSTEMS WITHIN THE WESTERN GROUP?

A. The Company's Western Group, comprised of the Pinal Valley, White Tank, Coolidge Airport, Tierra Grande, Stanfield and Ajo water systems, is a mix of older and newer water systems. For example, White Tank is a fairly new water system, with certain portions dating back to the 1960s. The majority of the White Tank distribution system is less than thirty years old. The Ajo water system is comprised of a distribution system dating back to the 1950s. The PVWS, comprised of Casa Grande and Coolidge, is a mix of older and newer water distribution systems. Portions of the Casa Grande water system, primarily downtown Casa Grande, date back to the early 1920s. Similarly, portions of the Coolidge water system, primarily downtown Coolidge, date back to the late 1920s and 1930s. Stanfield, located west of Casa Grande, has most of its water distribution system dating back to the 1950s and 1960s.

Q. WHAT WATER SYSTEMS WITHIN THE WESTERN GROUP SHOW SYMPTOMS OF AGING INFRASTRUCTURE?

A. While all of the water systems in the Western Group are aging, the Company's Pinal Valley and Coolidge Airport water systems show the most severe signs of aging – sharply higher water losses and increasing frequencies of water main and service line leaks and breaks. Mr. Schneider provides additional testimony on water losses in these water systems.

V. Factors Affecting the Company's Ability to Reduce Water Losses

Q. WHAT HAS THE COMPANY DONE TO ADDRESS AGING INFRASTRUCTURE AND SYSTEM WATER LOSS SINCE DECISION NO. 71845 WAS ISSUED BY THE COMMISSION?

A. The Company has always recognized the need to reduce water losses to the extent it is financially feasible. In Decision No. 71845 the Commission directed the Company to analyze its water loss data and identify key water loss reduction projects throughout the Company. The Commission also directed the Company to prepare a water loss report and file it with the Commission as a compliance item by December 31, 2011. See Decision No. 71845, page 92, line 27 through page 93, line 8. The Company identified three critical water main replacement projects specific to the Western Group. Because of the Commission's urgent directive in Decision No. 71845 ordering the Company to "reduce non-account water for each of its systems to less than 10 percent by July 1, 2011," the Company assigned a very high priority to these projects. The projects were commenced in October 2010 (little over a month following the Commission's order) and the Company expects to complete these Commission-ordered projects by the Commission's July 1, 2011 deadline.

Q. IS THE COMPANY REQUESTING THAT THOSE PROJECTS BE INCLUDED AS POST-TEST YEAR PLANT?

A. Yes. Strong public policy and compliance with the Commission's order on reducing system water loss support the inclusion of those Commission-ordered utility plant additions in rate base in this case.

Q. WILL THE COMPANY BE ABLE TO COMPLY WITH THE COMMISSION'S ORDER TO REDUCE WATER LOSS TO LESS THAN TEN PERCENT FOR ITS WATER SYSTEMS IN THE WESTERN GROUP?

A. Yes. The Company complies with this order for its White Tank and Ajo water systems at the present time. The Company will comply for its PVWS, because the Company undertook those infrastructure replacement projects listed above and is expressly seeking recovery of the cost of those projects in this proceeding. The work does not end with these projects, however, and the replacement plan will continue. The Company's water distribution system infrastructure replacement plan is more fully discussed by Mr. Schneider in his direct testimony.

VI. Costs to Replace Aging Infrastructure and Thereby Reduce Water Losses

Q. WITH REGARD TO THE COST OF REPLACING AGING TRANSMISSION AND DISTRIBUTION SYSTEM INFRASTRUCTURE, HOW DOES THE REPLACEMENT COST COMPARE WITH SUCH PLANT'S ORIGINAL COST?

A. According to the EPA report on Deteriorating Buried Infrastructure[10], the average cost to replace a 6-inch distribution main was $100 per foot in 2002 dollars. Mr. Schneider testifies about the increase in the cost of replacing aging water transmission and distribution system infrastructure in the PVWS, where infrastructure dates back to 1921.[11]

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10 *See* Exhibit WMG-4.

11 See Section X of Mr. Schneider's direct testimony.

Q. ARE THERE OTHER COSTS TO REPLACE AGING TRANSMISSION AND WATER DISTRIBUTION MAINS?

A. Yes. Several other categories of costs should also be considered in developing cost and budget estimates for constructing replacement transmission and water distribution mains. For example, in almost all cases, when transmission and distribution mains were originally installed, no customers were receiving water service. This is typical of most subdivision projects, because water mains, service lines and meters are all installed before water service is established.

Q. HOW DOES THIS FACT AFFECT THE COST OF REPLACING TRANSMISSION AND DISTRIBUTION MAINS?

A. Unlike initial installation, when conducting replacement work today, the Company must maintain water service to its customers while it constructs replacement facilities. Even if the Company can construct a new transmission and distribution main in an alternate location and thus avoid having to install temporary facilities, new water services are typically required as well as the need to tie-over every customer's existing on-site piping. In many cases, however, an alternative location is not available because public rights-of-way have become much more congested, as regulated and unregulated utility services of many types have been installed to meet the changing needs and demands of the consuming public. These factors lead to increased construction costs beyond changes solely due to increases in labor or material costs.

Q. DOES DEPRECIATION EXPENSE RECOVERY HELP REPLACE SUCH AGING TRANSMISSION AND WATER DISTRIBUTION INFRASTRUCTURE?

A. No. That only provides a small fraction of modern-day infrastructure replacement costs. The depreciation expense related to such infrastructure produces cash flows to help support infrastructure replacement. However, given the significant increase in replacement costs, cash flows from depreciation fall far short of the amount required to support such replacements.

Q. WILL THE RATES AUTHORIZED BY THE COMMISSION IN DECISION NO. 71845 SUPPORT THE FUNDING NEEDS OF REPLACING AGING TRANSMISSION AND DISTRIBUTION MAINS?

A. No. The rates established in Decision No. 71845 were designed to recover the cost of service based on a 2007 adjusted test year. No additional cost recovery or funding mechanism was established in the Decision that would provide additional cost recovery for the necessary infrastructure replacements required for the Western Group beyond the recorded adjusted test year utility plant additions in that case.

Despite the fact that rates went into effect on July 1, 2010, the Company is still not fully recovering its cost of service. This is primarily due to increases in operating costs and investment since the 2007 test year. As a result the Company's earnings are not sufficient to meet the interest coverage ratio test of its General Mortgage Bond Indenture. As a result, the Company is unable to issue additional long-term debt to fund capital expenditures, including the replacement of aging and leaking infrastructure, as discussed by Mr. Harris on page 6 of his direct testimony.

Q. WHAT LEVEL OF INFRASTRUCTURE REPLACEMENT FUNDING IS CONTEMPLATED OR NEEDED FOR THE COMPANY'S WESTERN GROUP?

A. The Company's total construction budget levels peaked at or near $19 million per year during the years arsenic treatment plants were being constructed, but did not include an increased level of transmission and water distribution replacement projects. Recent construction budgets have been significantly reduced from peak levels due to lack of earnings and inability to borrow, as further discussed by Mr. Harris his direct testimony.

The Company's Engineering department determined that at least $2.5 million per year needs to be expended on capital projects to replace aging transmission and distribution mains and services in the PVWS alone. In fact, it has completed a projection of these capital projects through 2014.[12]

Q. IS THIS LEVEL OF CONSTRUCTION SPENDING NORMALLY INCLUDED IN THE COMPANY'S ANNUAL CONSTRUCTION BUDGET?

A. No. This level of construction spending is above and beyond the Company's ability to fund. The construction budget has been significantly reduced to a level which can be supported by internally-generated cash flows due to the Company's inability to borrow.

VII. <u>Distribution System Improvement Charge ("DSIC")</u>

Q. HAS ANY OTHER PUBLIC UTILITY COMMISSION APPROVED OR AUTHORIZED A DSIC?

A. Yes. The Pennsylvania Public Utility Commission was the first utility commission in the United States to adopt a DSIC when it approved a DSIC for Philadelphia Suburban Water Company and Pennsylvania American Water Company"" in 1996. As an example of the benefits of a DSIC, Pennsylvania American Water Company has reported that it is now able to accelerate the replacement of aging infrastructure and reduce the projected time for full replacement from 225 years to 117 years, more closely matching the estimated practical life of distribution infrastructure. Based on current rates of infrastructure replacement, the Company estimates that it will take more than hundreds of years for full replacement of its current infrastructure. Mr. Schneider provides additional testimony about the rate of infrastructure replacement without the approval of a DSIC.[13]

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[12] *See* Mr. Schneider's direct testimony and exhibits.

[13] *See* Mr. Schneider's direct testimony, page 54.

Q. DID THE COMMISSION REACH ANY CONCLUSIONS IN DECISION NO. 71845 ABOUT THE NEED FOR A DSIC?

A. Yes, the Commission concluded that it needed more information, evidence and a fully developed record upon which it could determine if a DSIC is reasonable for certain of the Company's aging infrastructure or for its systems that face other unique challenges.[14] In response to that conclusion, the Company is providing that evidence and support in this case.

Q. YOU HAVE TESTIFIED ABOUT THE NEED TO PROVIDE RELIABLE AND ADEQUATE WATER SERVICE AND HAVE REQUESTED THE COMMISSION TO APPROVE A DSIC. HAS THE COMPANY STUDIED THE COSTS AND BENEFITS OF A DSIC?

A. Yes. In Decision No. 71845, the Commission ordered the Company to prepare a study of the DSIC mechanism and to provide details of the benefits and costs of implementing a DSIC and how they will be balanced with regard to customers. The Commission stated that the DSIC Study should be used by the Company in future rate proceedings, such as this general rate case.

Q. WHEN IS THE COMPANY REQUIRED TO SUBMIT SUCH A DSIC STUDY TO THE COMMISSION?

A. The Company is required to file a copy of the DSIC Study with Commission Docket Control in Docket No. W-01445A-08-0440 no later than June 30, 2011. The Company has prepared an initial DSIC study in advance of the required filing which is attached as Exhibit JDH-4 to Mr. Harris' Direct Testimony.

Q. WHAT IS THE CONCLUSION OF THIS FORM OF DSIC STUDY AND HOW DOES A DSIC APPLY IN THIS PROCEEDING?

A. This advanced form of a DSIC study concludes that replacement of aging infrastructure cannot be funded in the usual and customary ratemaking manner

[14] *See* Decision No. 71845, page 76, lines 5-7.

because of the sheer magnitude of the funding needed to replace such infrastructure. Delaying infrastructure replacement too long could lead to degradation of service, water quality, service reliability, and require sudden and significant increases in rates to address replacements on an emergency basis. The benefits achieved from a DSIC are improvements in water service reliability. Another conclusion of the DSIC study is that replacement of aging infrastructure can be completed sooner and with smaller rate increases by using DSIC funding mechanisms.[15]

Q. ARE THERE OTHER BENEFITS ACHIEVED BY A DSIC?

A. Yes. In addition to direct cost benefits and improvements to reliability and adequacy, the local community will benefit. Main breaks or leaks damage roadways and landscaping. Disruptions to traffic and barricaded streets also negatively affect local businesses. These impacts and the risks of these impacts can be avoided through careful planning and commitments to replace aging infrastructure on a routine, scheduled basis, as well as providing the financial means to do so.

Q. WHAT IMPACT WOULD A DSIC SURCHARGE HAVE ON RATES IF THE COMMISSION APPROVES A DSIC PROCEDURE IN THIS PROCEEDING?

A. At a level of infrastructure replacement equal to $2.5 million per year, a DSIC surcharge would result in an annual increase of approximately $0.99 per month for the average PVWS residential customer.[16]

Q. WHAT DO YOU ANTICIPATE THE PUBLIC'S ACCEPTANCE TO BE CONCERNING INCREASES IN UTILITY RATES TO REPLACE AGING INFRASTRUCTURE?

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[15] *See* Mr. Harris' direct testimony, Exhibit JDH-4.

[16] *See* Mr. Harris' direct testimony, page 20.

A. A recent study shows that most residential customers would be willing to pay as much as $6.20 per month on average to address aging water infrastructure.[17]

Q. WHY DO YOU BELIEVE THAT THERE IS SUCH STRONG SUPPORT FOR EFFECTIVE MEANS TO ADDRESS AGING INFRASTRUCTURE?

A. Replacing aging infrastructure, including water and wastewater infrastructure has been a primary focus of the American Recovery and Reinvestment Act, and a significant amount of press coverage over the past two years has alerted the public to the risks and costs of failing to replace and the public accurately perceives that aging infrastructure adversely affects the reliability and adequacy of water service to their homes.

Water main breaks are also highly visible to the public; they can interfere with local traffic and even cause significant property damage, so it is not surprising that the public is well aware of aging infrastructure and the problems it causes.

Q. BESIDES RELIABILITY AND SERVICE ADEQUACY, ARE THERE OTHER STRONG PUBLIC POLICY REASONS TO REPLACE AGING INFRASTRUCTURE?

A. Yes. Water is a scarce and valuable resource, particularly in Arizona; it must be used wisely and conserved. Irrespective of its scarcity, water losses must be minimized as much as possible because of the costs the Company incurs to produce and treat that water. Ultimately, if infrastructure is not adequately maintained, operating costs will increase, resulting in higher rates.

Q. FROM A RESOURCE PERSPECTIVE, WHAT IMPACTS WILL RESULT IF INFRASTRUCTURE IS NOT MAINTAINED OR REPLACED WHEN NEEDED?

A. Although leaks in mains may be returned to the hydrologic water cycle at some point, increasing water loss places higher demands on a water system, ultimately requiring more water production, treatment, storage, and transmission and

[17] *See* Exhibit WMG-5.

distribution capacity to meet demands, together with the corresponding costs of doing so, as well as causing additional wear on pumping equipment.

Q. CAN GROWTH ALONE PAY FOR THE REPLACEMENT OF AGING INFRASTRUCTURE?

A. No. Customer growth would not provide the funds to replace infrastructure that needs to be replaced. Further, the benefits of replacing aging infrastructure apply to all customers, and it would be unfair to single out and burden new customers to bear this cost. First, the infrastructure that needs to be replaced is needed now to provide reliable and adequate service to existing customers. Second, the Company is proposing that the Commission approve an Off-Site Facilities Fee tariff that would collect fees from new developments to fund new infrastructure. It would not be fair to ask developers to pay for the full cost of serving new developments and also ask them to pay to replace aging and failing infrastructure needed to serve existing customers.

Q. HAS THE COMMISSION ADOPTED ANY OTHER METHOD TO ADDRESS THE LARGE CAPITAL INVESTMENTS NEEDED TO PROVIDE SAFE, RELIABLE OR ADEQUATE WATER SERVICE?

A. Yes. The Company faced a significant need for investment in the construction of water treatment plants to remove arsenic from drinking water. Those treatment plants were required to ensure the safety of the water provided by the Company to its customers and to comply with the stringent new arsenic Maximum Contaminant Level ("MCL") established by the EPA under the Safe Drinking Water Act. The Company could not have funded the approximately $35 million of treatment plant investment without the establishment of the ACRM. The Commission authorized and approved the ACRM, the first such mechanism of its kind in Arizona, which proved to be an effective way to ensure adequate funding for the required arsenic water treatment plants. Mechanisms such as a DSIC or an ACRM augment

Arizona's traditional rate case process based on a historic test year methodology, and can and do support the level of investments required to address mandated compliance with the arsenic MCL and the infrastructure replacements the Company currently faces, which is why it is so important to authorize a DSIC in this proceeding.

Q. HOW WOULD A DSIC WORK IN THIS CASE AND HOW WOULD IT HELP TO MEET THE INFRASTRUCTURE REPLACEMENT NEEDS OF THE COMPANY'S PVWS?

A. The DSIC is comparable to the ACRM in many ways. The ACRM was needed to fund utility plant needed to comply with safe drinking water standards for existing customers, and the DSIC is needed to fund replacement of utility plant required to maintain reliable and adequate water service to existing customers. Neither of these mechanisms is associated with utility plant needed to serve new development, nor are these mechanisms linked to customer growth or new revenues. The DSIC approach to infrastructure replacement will build on the success of the Commission's approach to infrastructure needed to comply with the new arsenic MCL. Today there is a compelling need to provide reliable and adequate water service that is being jeopardized by aging infrastructure.

Q. HOW DO WATER LOSS CONTROL EFFORTS, INFRASTRUCTURE REPLACEMENTS AND A DSIC RELATE TO EACH OTHER?

A. The Company manages water loss through careful oversight, monitoring for leaks, repairing leaks and breaks, maintaining accurate water meters, guarding against water theft and keeping its systems in good condition. As systems age and pipes begin to leak or break, there is a shift from maintaining facilities to replacing facilities. The optimum time to replace facilities rather than simply repair them is based on a number of factors. These factors include an assessment of the critical nature of the facility or infrastructure, the cost of replacement versus repair, the history of leaks or breaks, an assessment of the condition of the utility infrastructure, the impacts to service reliability or adequacy, and impacts on the quality of water served. As stated earlier, the ability of the Company to fund such replacements is limited by its ability to recover the associated costs. Implementation of the DSIC would provide that mechanism.

VIII. <u>An Overview of the Need to Continue the Company's Consolidation Plan</u>

Q. WHAT IS THE COMPANY'S PLAN FOR CONSOLIDATION OF THE COMPANY'S WESTERN GROUP IN THIS RATE PROCEEDING?

A. The Company proposed a plan in its last rate case (Docket No. W-01445A-08-0440) to consolidate the following groups of water systems: 1) Superstition and Miami, 2) Casa Grande, Coolidge and Stanfield, 3) Rimrock, Pinewood and Sedona, 4) Lakeside and Overgaard, and 5) Bisbee and Sierra Vista. The Commission approved the Company's consolidation proposal.[18] The Commission also directed the Company to file a rate consolidation study with Commission Docket Control in Docket No. W-01445A-08-0440. The Company did so on September 30, 2010.

Consistent with this rate consolidation study, the Company proposes to consolidate its White Tank water system with its PVWS. Mr. Harris testifies in greater detail about the consolidation proposals addressed within this rate application and the benefits achieved by such consolidations.[19]

As Mr. Harris testifies, the Company's consolidation proposal is a conservative and gradual move toward a more complete and full consolidation and avoids sudden changes in rates.

Q. DOES THE COMPANY STILL HAVE THE GOAL TO CONSOLIDATE ITS WATER SYSTEMS WITHIN EACH GROUP?

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[18] *See* Decision No. 71845.

[19] *See* Mr. Harris' direct testimony, pages 9-11.

A. Yes. As long as the consolidations conform to the principles set forth in the Consolidation Study, the Company will continue to propose consolidations. For the reasons discussed in that study, full consolidation of all of its water systems within the Western Group is not yet supportable.

IX. An Overview of the Success of the ACRM and the Need to Continue the ACRM

Q. PLEASE DESCRIBE THE BASIS FOR THE COMPANY'S ORIGINAL REQUEST FOR THE COMMISSION TO APPROVE AN ACRM.

A. The Company faced a water safety issue when the EPA adopted a new safe drinking water standard for arsenic which became effective in 2006, reducing the arsenic MCL from 50 parts per billion ("ppb") to 10 ppb. The Company determined that approximately $35 million was needed to design and construct arsenic treatment plants in its Western, Eastern and Northern Groups over a three year period. This level of capital investment would not have been possible without the approval of a mechanism to expeditiously recover at least part of the cost of constructing and operating these arsenic treatment plants.

The Commission and its Staff recognized that the safety of drinking water was a top priority for the Commission and worked with the Company to establish the ACRM. The Commission's progressive and forward-thinking approach provided a practical solution to providing for funding facilities required to ensure the delivery of safe drinking water to the Company's customers. This same approach was subsequently approved for other water companies.

Q. DID THE COMMISSION APPROVE CONTINUATION OF THE ACRM IN DECISION NO. 71845?

A. Yes. The Commission approved continuation of the ACRMs for the Company's Sedona and Superstition water systems.

Q. DOES THE COMPANY PLAN TO CONSTRUCT ADDITIONAL ARSENIC TREATMENT PLANTS OR TO EXPAND TREATMENT PLANTS FOR ANY OTHER SYSTEMS IN THE WESTERN GROUP?

A. Yes. Mr. Schneider testifies in Section VI in his direct testimony that the Company is planning to construct an expansion of the Henness Road arsenic treatment plant and construct a new arsenic treatment plant at its Coolidge Well No. 13. These plants are similar to the treatment plants proposed for construction in connection with its Sedona (Verde Valley) and Superstition water systems, and the Company requests that the Commission approve the continuation of the ACRM for the Company's Western Group as well.

Q. ARE THESE TREATMENT PLANT PROJECTS NEEDED TO COMPLY WITH SAFE DRINKING WATER STANDARDS?

A. Yes. The original phase of treatment plants constructed in the Company's PVWS did not include treatment for all of the arsenic-contaminated wells within that system. Treatment for the remaining wells is needed to ensure system reliability and adequacy in addition to complying with safe drinking water standards. The ACRM will provide a source of funding for these additional treatment plants that are not included in existing levels of revenues and operating income.

X. <u>An Overview of Conservation Efforts and BMPs and the Need to Fund BMPs</u>

Q. WHAT IS THE STATUS OF THE COMPANY'S IMPLEMENTATION OF BMPs AS REQUIRED IN DECISION NO. 71845?

A. The Company submitted for the Commission's consideration the additional BMPs required in Decision No. 71845 on December 22, 2010. As of the date of this application, the Commission is still considering the Company's proposed BMPs. In addition, the Company is requesting that the Commission approve the recovery of additional BMP costs in this proceeding for the Company's Western Group.[20]

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[20] *See* Mr. Reiker's' direct testimony, Page 21

Q. UNDER WHAT CONSERVATION PROGRAM IS THE COMPANY REGULATED BY THE ADWR?

A. The Company's larger systems are regulated under ADWR's Modified Non-Per-Capita Conservation Program for water systems located in an Active Management Area ("AMA"). Its smaller water systems located in an AMA, i.e., those water systems withdrawing less than two-hundred fifty (250) acre-feet of groundwater per year are not subject to conservation requirements. The Company's Western Group includes large water systems (PVWS and White Tank) and small water systems (Stanfield and Tierra Grande) which are located within an AMA, and Ajo, which is not located in an AMA.

Q. DOES THE COMPANY INTEND TO IMPLEMENT THE BMPs REQUIRED IN DECISION NO. 71845?

A. Yes. A number of BMPs were implemented before Decision No. 71845. The additional BMPs have been submitted for the Commission's consideration and when approved by the Commission, the Company will implement them.

XI. <u>The Need for an Off-Site Facilities Fee</u>

Q. HOW DOES THE COMPANY PLAN TO FUND LARGE REGIONAL SCALE INFRASTRUCTURE, SUCH AS A SURFACE WATER TREATMENT PLANT, FOR ITS PVWS?

A. The Company looks to new development to pay the cost of designing and constructing water infrastructure needed to meet the demands of such development. Main extension agreements together with Advances or Contributions provide funding primarily for onsite facilities within individual developments and subdivisions. But funding large regional scale infrastructure, such as a surface water treatment facility, additional water supplies, and major upgrades of the water transmission and distribution system are best funded through the facilities fees received from developers and not customers. Mr. Harris testifies about the Off-Site Facilities Fee tariff proposed by the Company in this case.[21]

Q. WHAT ARE THE BENEFITS OF FUNDING NEW FACILITIES IN THIS WAY?

A. The benefits are twofold. This method of funding shields existing ratepayers from the rate effects of funding infrastructure to serve new development. Another benefit is that customers are not subject to the costs and risks associated with building needed utility plant additions in advance of development.

Q. WHAT LEVEL OF CONTRIBUTIONS WOULD BE GENERATED FROM THE OFF-SITE FACILITIES FEE TARIFF IF IT IS APPROVED BY THE COMMISSION?

A. Although the housing market and development are presently at a standstill due to the current recession and high foreclosure rates, when the housing market begins to recover, the utility plant required for meeting the water demands of development will need to be constructed. This fact, when coupled with the increasing need to fund replacement infrastructure, leads me to believe that funding utility plant directly from developers is prudent and necessary Mr. Harris provides additional testimony on the amount of capital expected to be raised by the Off-Site Facilities Fee, but his projections depend on the rate of customer growth assumed in the future.[22]

XII. <u>The Need to Continue Central Arizona Project ("CAP") Hook-Up Fees</u>

Q. SHOULD THE COMMISSION CONTINUE CAP HOOK-UP FEES FOR THE COMPANY'S PINAL VALLEY AND WHITE TANK WATER SYSTEMS?

A. Yes. The CAP Hook-Up Fees have been an effective tool to recover the cost of maintaining CAP water allocations. Although the housing market and development are at a standstill, when growth returns to a more normal level, the

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21 *See* Mr. Harris' direct testimony, pages 20-22

22 *See* Mr. Harris' direct testimony, page 20.

fees collected under the CAP Hook-Up Fee tariff will continue to help pay for this much needed resource. Mr. Reiker testifies further about CAP Hook-up Fees, and Mr. Schneider testifies further about the planned use of CAP water, in their respective direct testimonies.[23]

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS MATTER?

A. Yes.

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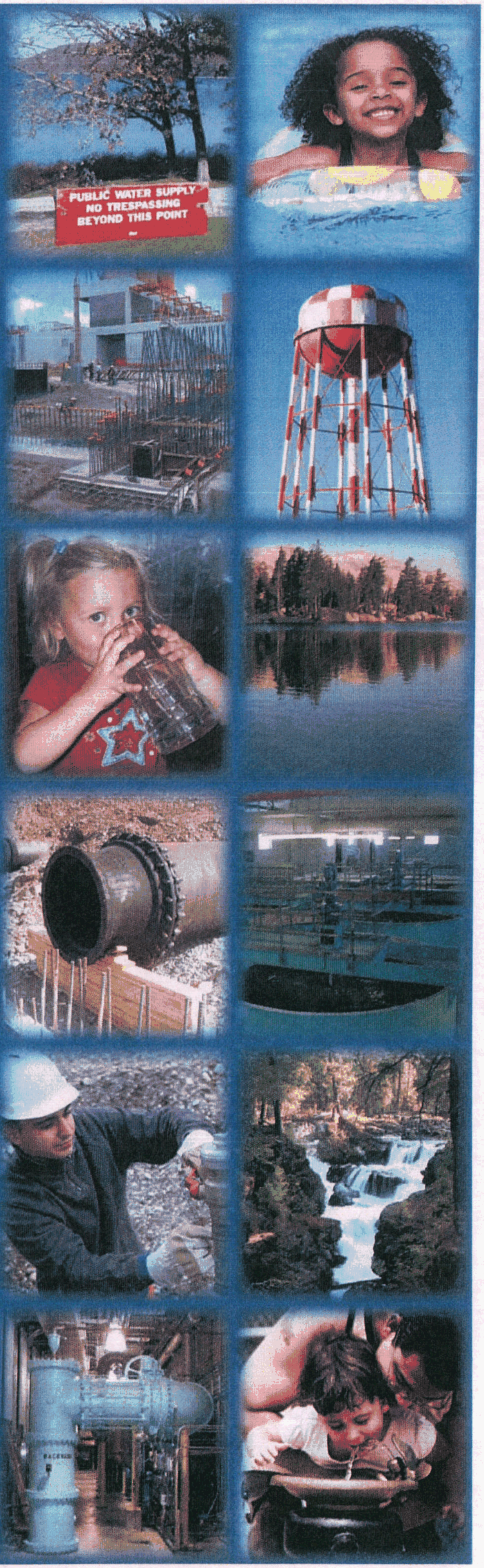
[23] *See* Mr. Reiker's direct testimony, page 5 and Section VIII of Mr. Schneider's direct testimony.

WMG-1

United States
Environmental Protection
Agency

Drinking Water Infrastructure Needs Survey and Assessment

Fourth Report to Congress



Executive Summary

Total National Need

The U.S. Environmental Protection Agency's (EPA's) fourth national assessment of public water system infrastructure needs shows a total twenty-year capital improvement need of $334.8 billion. This estimate represents infrastructure projects necessary from January 1, 2007, through December 31, 2026, for water systems to continue to provide safe drinking water to the public. The national total comprises the infrastructure investment needs of the nation's approximately 52,000 community water systems and 21,400 not-for-profit noncommunity water systems, including the needs of American Indian and Alaskan Native Village water systems, and the costs associated with proposed and recently promulgated regulations. The findings are based on the 2007 Drinking Water Needs Survey and Assessment (DWINSA or Assessment) which relied primarily on a statistical survey of public water systems (approximately 3,250 responses).

$334.8 Billion is Needed

The nation's drinking water utilities need $334.8 billion in infrastructure investments over the next 20 years for thousands of miles of pipe as well as thousands of treatment plants, storage tanks, and other key assets to ensure the public health and economic well-being of our cities, towns, and communities.

Authority, Purpose, and History

The 1996 Safe Drinking Water Act Amendments mandated that EPA conduct an assessment of the nation's public water systems' infrastructure needs every 4 years, and use the findings to allocate Drinking Water State Revolving Fund (DWSRF) capitalization grants to states. The DWSRF was established to help public water systems obtain financing for improvements necessary to protect public health and comply with drinking water regulations. From 1997 to 2007, states loaned $12.6 billion to water systems for 5,550 projects.

The estimate covers infrastructure needs that are eligible for, but not necessarily financed by, Drinking Water State Revolving Fund (DWSRF) monies (note-DWSRF is designed to supplement, not replace, investment funding by states and localities as well as rate payers). Projects eligible for DWSRF funding include the installation of new infrastructure and the rehabilitation, expansion, or replacement of existing infrastructure. Projects may be needed because existing infrastructure is deteriorated or undersized, or to ensure compliance with regulations. Cost estimates assume comprehensive construction costs including engineering and design, purchase of raw materials and equipment, construction and installation labor, and final inspection.

EPA recognizes that there are legitimate and significant water system needs that are not eligible for DWSRF funding, such as raw water dams and reservoirs, projects related primarily to population growth, and water system operation and maintenance costs. However, because the Assessment is directly associated with the allocation of DWSRF capitalization grants, needs ineligible for DWSRF funding are not included in the estimate.

National Need Compared to Previous Needs Assessments

EPA conducted three previous Assessments, in 1995, 1999, and 2003. Exhibit ES.1, which adjusts the findings to 2007 dollars, shows the 2007 Assessment's total national need

Exhibit ES.1: DWINSA Comparison of 20-Year National Need

Year	1995	1999	2003	2007
National Need	$200.4	$198.2	$331.4	$334.8

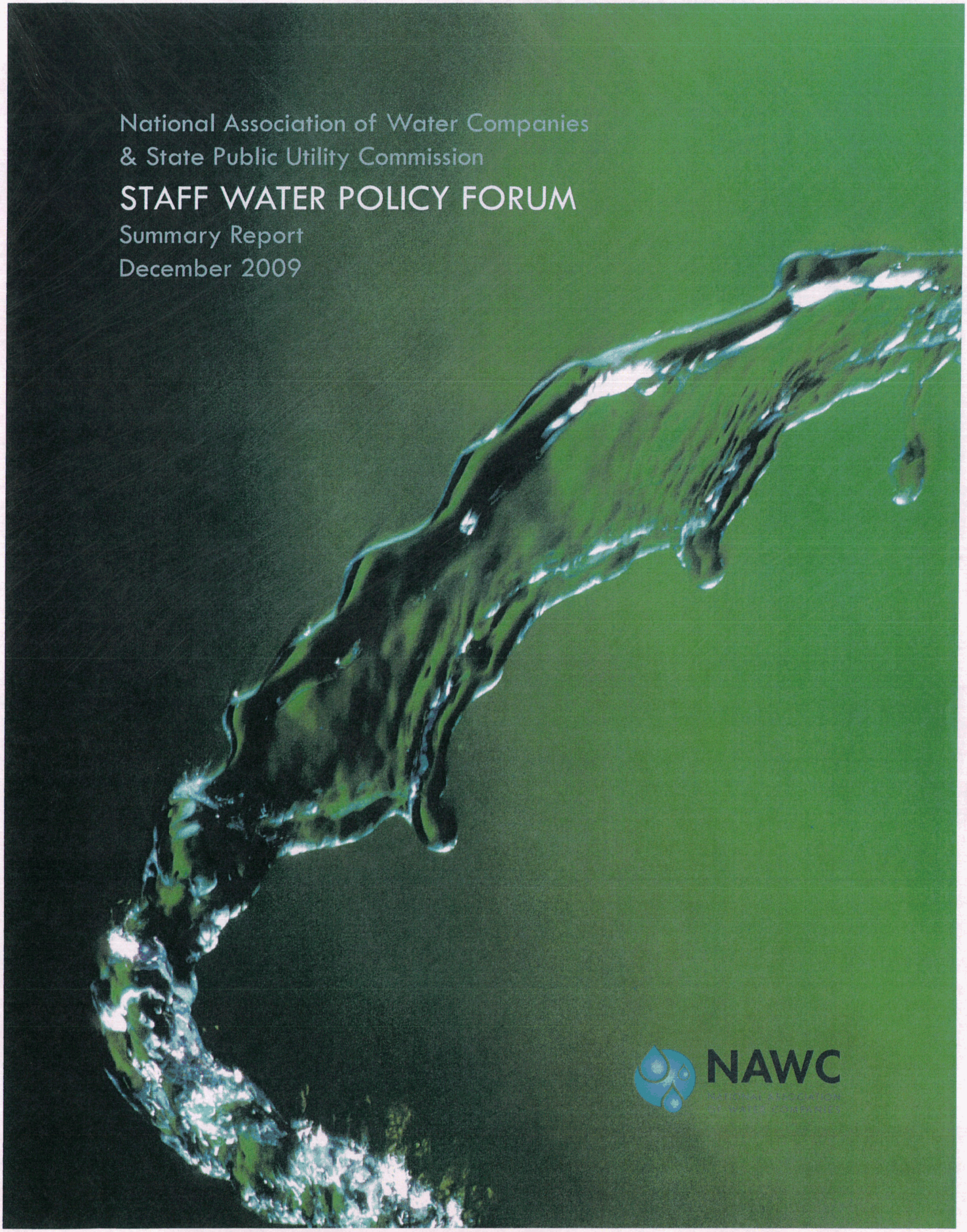
The national 20-year need estimate is reported in billions of January 2007 dollars.

WMG-2

National Association of Water Companies
& State Public Utility Commission

STAFF WATER POLICY FORUM

Summary Report
December 2009



NAWC

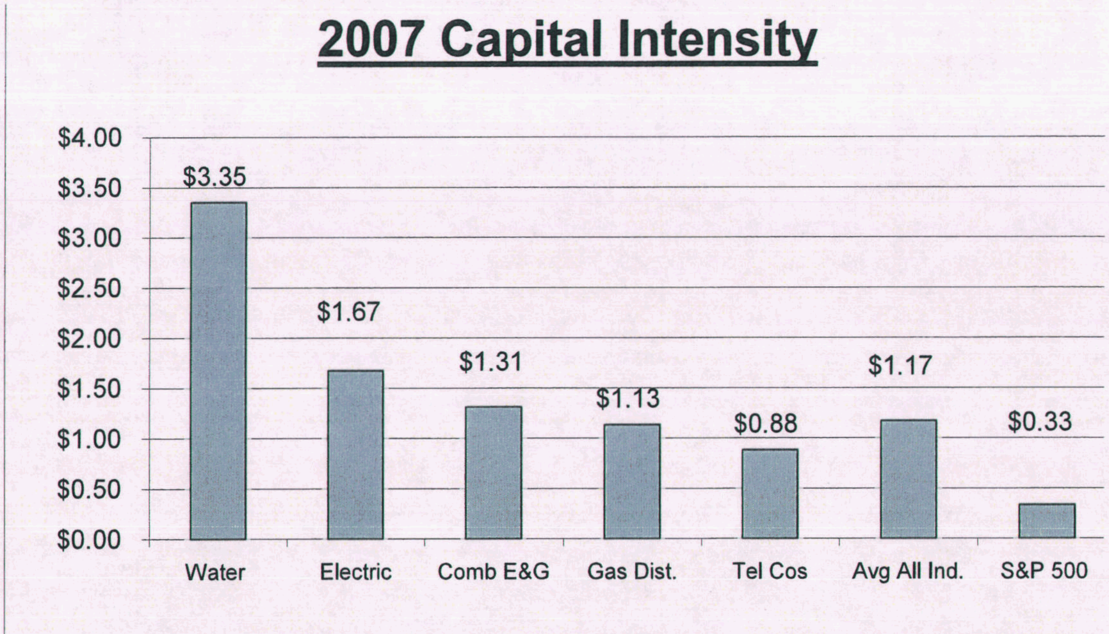
the unconstitutional confiscation of the property of the utility and its shareholders, and to assure that the utilities have access to the resources and capital necessary to provide service to their customers and otherwise fulfill their obligations as public utilities.

2. Capital Attraction

Generally, a company has to attract outside capital if it cannot generate enough funds internally to make investments necessary to meet customer needs today and into the future. The economics of the water industry make capital attraction the sine qua non of a financially and operationally healthy utility. Accordingly, the ability to provide reasonable rates of return to investors is essential for a water utility to provide high quality, reliable service to its customers. The inability to attract capital will impair the utility's financial and operational performance and therefore impair its ability to provide quality service at reasonable cost to customers.

In addition, Mr. Foran noted that capital attraction is particularly important to the water industry because of the need to replace aging infrastructure and comply with ever more stringent water quality standards. Based on USEPA estimates, the costs to replace aging infrastructure and comply with water quality requirements for the water and wastewater industries over the next 20 years could approach one trillion dollars.

Utilities are more capital intensive than most other industries and water utilities are the most capital intensive of all the traditional utilities. According to Mr. Foran, this means that more dollars of capital are invested by water utilities for each $1 of revenue received than in the electric, gas, or telecom industries and significantly more than the S&P 500.



On the other hand, service industries, such as legal, medical, financial or engineering require relatively minor levels of capital to produce $1.00 of revenue. Manufacturing requires machines, equipment, and large buildings to produce a product. However, most of the manufacturing industries, even the steel industry, do not require as much capital to produce $1.00 of revenue as does the water industry. Recent statistics show that water utilities invest $3.35 in capital to produce $1.00 of revenue, while in the electric, gas and telecom industries capital investment of $1.67, $1.13 and $0.88, respectively, produces a $1.00 of revenue, as indicated in the above graph.

WMG-3

ARIZONA CORPORATION COMMISSION
UTILITIES DIVISION

ANNUAL REPORT MAILING LABEL – MAKE CHANGES AS NECESSARY

1A

W-01445A

Arizona Water Company
P.O. Box 29006
Phoenix, AZ 85038-9006

ANNUAL REPORT
Water

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ACC UTILITIES DIRECTOR

FOR YEAR ENDING

12	31	2009

FOR COMMISSION USE

ANN 04	09

4-15-10

COMPANY NAME: ARIZONA WATER COMPANY

UTILITY PLANT IN SERVICE

Acct. No.	DESCRIPTION	Original Cost (OC)	Accumulated Depreciation (AD) *	O.C.L.D. (OC LESS AD)
301	Intangible-Organization	651		
302	Intangible-Franchises	111,601		
303	Intangible-Miscellaneous	2,319,704		
310.10	Source of Supply-Water Rights	4,108,259		
310.30	Source of Supply-Land-Other-Wells	1,197,420		
314	Source of Supply-Wells	27,280,742		
320	Pumping-Land	86,789		
321	Pumping-Structures and Improvements	1,027,635		
325	Pumping-Electrical Equipment	28,480,611		
328	Pumping-Gas Engine Equipment	209,204		
330	Water Treatment-Land	683,529		
331	Water Treatment-Structures and Improvements	1,933,631		
332	Water Treatment-Equipment	19,587,188		
340	Transmission and Distribution-Land	837,413		
342	Transmission and Distribution-Storage Tanks	12,822,668		
343	Transmission and Distribution-Mains	187,229,775		
344	Transmission and Distribution-Fire Sprinklers	52,516,234		
345	Transmission and Distribution-Services	4,318,953		
346	Transmission and Distribution-Meters	7,506,199		
348	Transmission and Distribution-Hydrants	17,540,966		
389	General-Land	70,136		
390	General-Structures and Improvements	2,257,296		
391	General-Office Furniture and Equipment	6,300,162		
393	General-Stores Equipment	78,161		
394	General-Tools, Shop and Garage Equipment	1,490,973		
395	General-Laboratory Equipment	214,511		
396	General-Power Operated Equipment	229,633		
397	General-Communication Equipment	4,309,082		
398	General-Miscellaneous Equipment	423,487		
	Totals	385,172,613	84,893,334	300,279,279
	LEASEHOLD IMPROVEMENTS			
390	General-Structures and Improvements	2,409,484	1,410,116	999,368
	TOTALS	387,582,097	86,303,450	301,278,647

* Depreciation is calculated using composite and component depreciation rates. Leasehold improvements are amortized on a straight line basis over the life of the lease.

COMPANY NAME: ARIZONA WATER COMPANY

COMPARATIVE STATEMENT OF INCOME AND EXPENSE

Acct. No.	OPERATING REVENUES	PRIOR YEAR	CURRENT YEAR
461	Metered Water Revenue	$47,008,646	$48,844,566
462	Fire Protection Revenue	49,258	52,544
470	Late Charges	157,807	156,214
471	Miscellaneous Service Revenues	1,992,436	1,955,322
472	Rents from Water Property	6,417	4,787
474	Other Water Revenues	415,317	416,399
	TOTAL OPERATING REVENUES	$49,629,881	$51,429,832
	OPERATING EXPENSES		
600	Source of Supply Operation-Supervision and Engineering	$90,414	$100,573
601	Source of Supply Operation-Labor and Expenses	0	0
602	Source of Supply Operation-Purchased Water	1,798,911	1,954,970
603	Source of Supply Operation-Miscellaneous	74,860	73,364
610	Source of Supply Maintenance-Supervision and Engineering	53,694	70,293
614	Source of Supply Maintenance-Wells and Springs	8,379	602
620	Pumping Operation-Supervision and Engineering	62,348	51,958
623	Pumping Operation-Purchased Power	4,571,494	4,833,983
624	Pumping Operation-Labor and Expenses	1,287,646	1,171,825
630	Pumping Maintenance-Supervision and Engineering	42,152	37,860
631	Pumping Maintenance-Structures and Improvements	150,089	110,013
633	Pumping Maintenance-Equipment	403,876	295,146
640	Water Treatment Operation-Supervision and Engineering	56,943	56,371
641	Water Treatment Operation-Chemicals	240,694	391,696
642	Water Treatment Operation-Labor and Expenses	1,144,783	2,136,434
650	Water Treatment Maintenance-Supervision and Engineering	45,104	34,655
651	Water Treatment Maintenance-Structures and Improvements	1,459	1,307
652	Water Treatment Maintenance-Equipment	335,893	354,612
660	Trans. and Distrib. Operation-Supervision and Engineering	84,843	57,681
661	Trans. and Distrib. Operation-Storage Facilities	48,945	33,615
662	Trans. and Distrib. Operation-Lines Expenses	625,408	512,152
663	Trans. and Distrib. Operation-Meters	1,395,161	1,275,191
664	Trans. and Distrib. Operation-Customer Installations	110,437	94,467
665	Trans. and Distrib. Operation-Miscellaneous	134,390	116,964
666	Trans. and Distrib. Operation-Rents	29,835	17,000
670	Trans. and Distrib. Maintenance-Supervision and Engineering	309,881	275,888
672	Trans. and Distrib. Maintenance-Tanks	466,849	466,063
673	Trans. and Distrib. Maintenance-Mains	1,068,616	1,016,900
675	Trans. and Distrib. Maintenance-Services	967,586	805,662
676	Trans. and Distrib. Maintenance-Meters	355,261	277,527
677	Trans. and Distrib. Maintenance-Hydrants	115,014	180,192

WMG-4

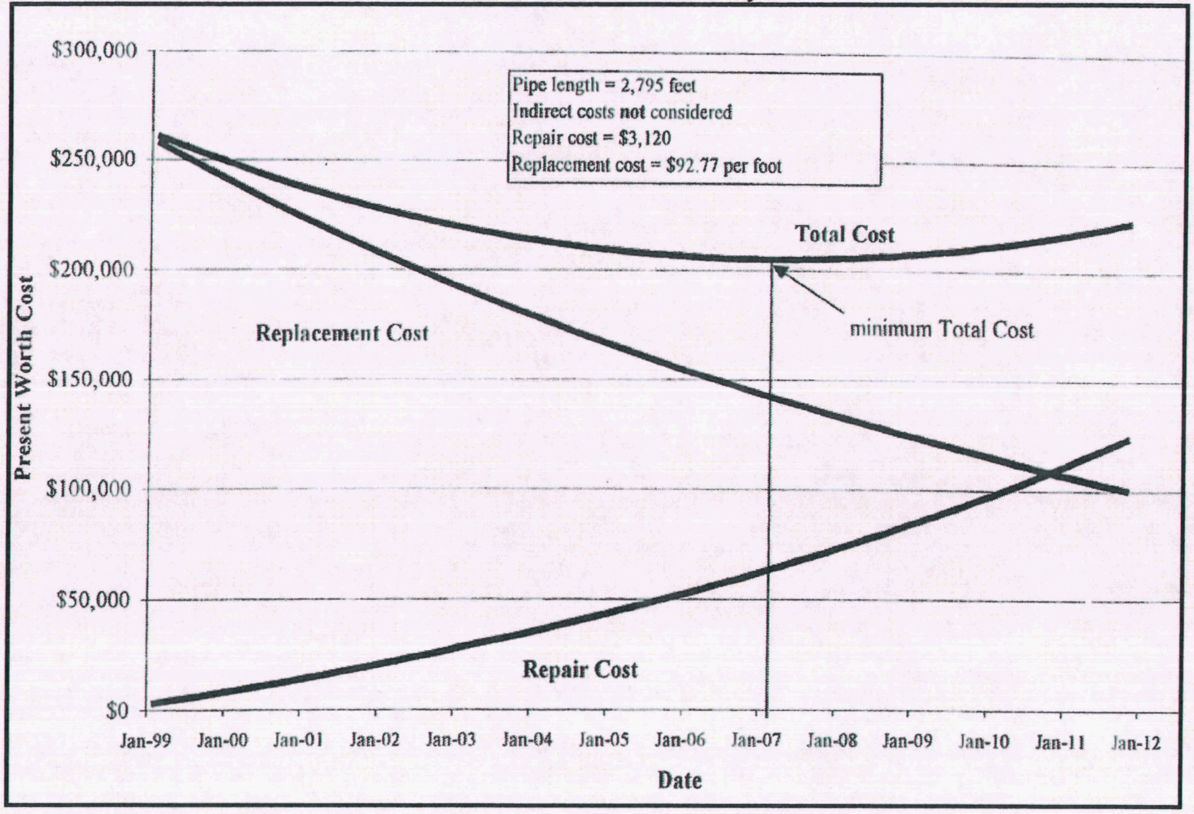
United States
Environmental Protection
Agency

Office of Water (4601M)
Office of Ground Water and Drinking Water
Distribution System Issue Paper

Deteriorating Buried Infrastructure Management Challenges and Strategies

May, 2002

Exhibit No. 5
Economic Break Even Analysis



This is an extraordinary case due to the unusually high number of main breaks. Most water utilities are not experiencing main breaks at such a rate and cannot economically justify replacement over repair. It also is important to note that the economic model is based on standard engineering economics, and does not incorporate financial factors such as taxes on capital investment and depreciation. If these additional factors were considered, the analysis would slant further in favor of repairing instead of replacing mains.

Consider the following example where actual direct costs for replacement and repair are compared. Average replacement costs are approximately $100/foot for 6-inch main. Therefore, for a 1,000-foot main, total replacement costs would be approximately $100,000. If the utility expects to recover that investment, the annualized revenue requirement or cost would be $10,000 to $15,000, depending on financing cost or economic regulation (investor-owned utilities). Repair costs on the main are approximately $3,000 per break. Consequently, in order to justify replacing that pipe purely from a cost standpoint, the main must experience breaks at a rate of approximately 3 to 5 per year. A rate of 4 breaks per year is a break every 3 months for a length of pipe slightly longer than a city block. Such a high break rate is very unlikely and certainly would not be tolerated by customers subjected to such frequent service and traffic disruptions. Therefore, other factors such as the stakeholder and liability costs associated with main breaks must also be considered.

WMG-5

ITT

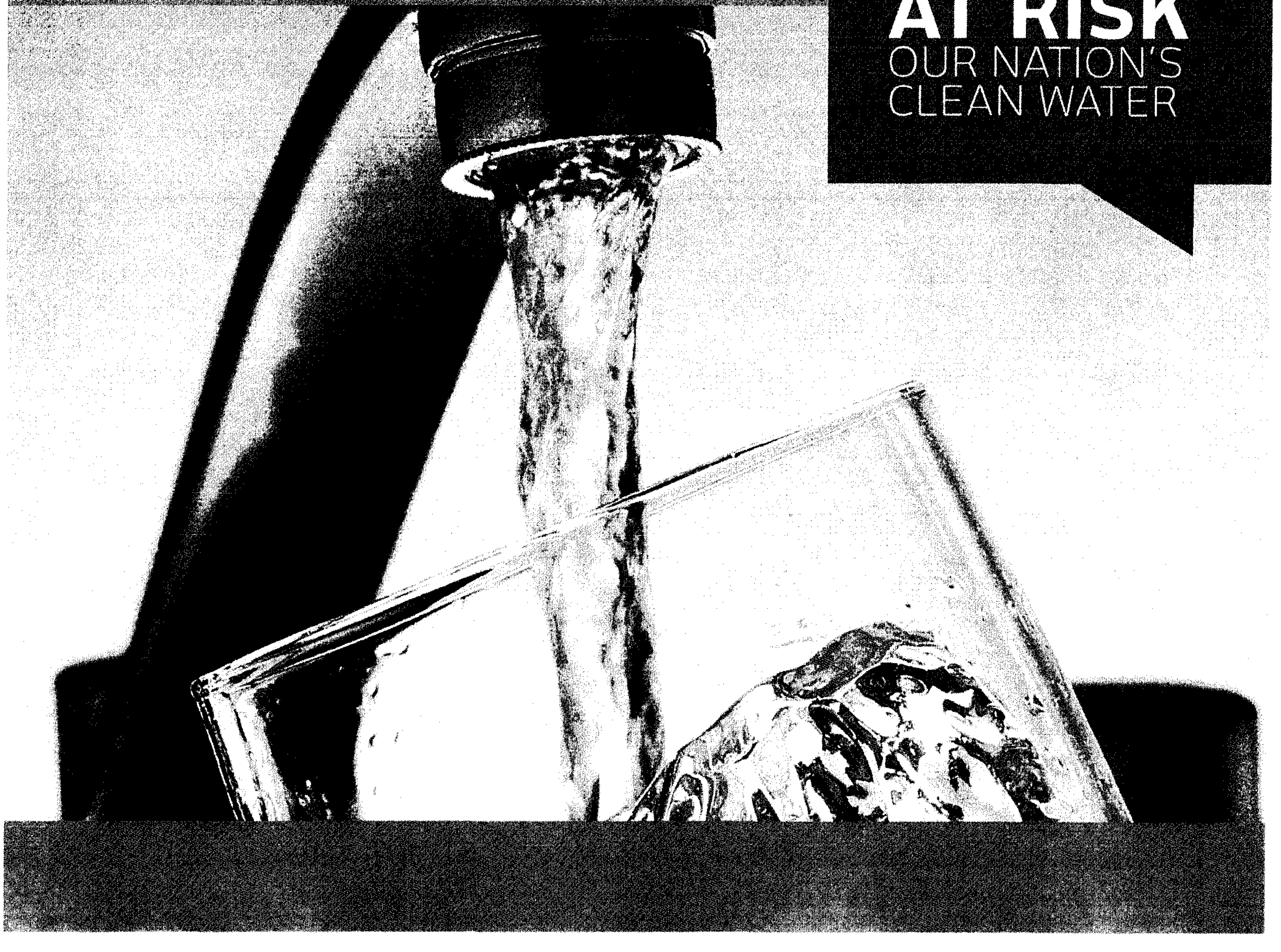
VALUE OF WATER SURVEY

AMERICANS ON THE U.S. WATER CRISIS

650
WATER MAIN BREAKS PER DAY

$2.6
BILLION IN LOST WATER EVERY YEAR

AT RISK
OUR NATION'S CLEAN WATER



TWO-THIRDS OF AMERICAN VOTERS ARE WILLING TO PAY AN AVERAGE OF $6.20 MORE PER MONTH

$6.20

AMOUNT VOTERS ARE WILLING TO PAY MORE, PER MONTH

AVERAGE PERCENTAGE INCREASE OVER CURRENT WATER BILL

11%

An increase of only 11% by 63% of American households alone would lead to increased investment in our nation's water infrastructure by more than $5 billion per year*

Of the 57% of businesses** willing to pay more now, the average acceptable increase is 7%

*BASED ON 2010 CENSUS U.S. BUREAU PROJECTIONS: 114,200,000 U.S. HOUSEHOLDS

**INDUSTRIAL AND AGRICULTURAL BUSINESSES ONLY

Q40/41: How much would you say you/your company pays on average each month for your water bill?
Q44: How much more money would you/do you think your company would be willing to pay each month to upgrade our water system to ensure that we have long term access to clean water? / Base-Voters: 1,003; Business**: 502

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

W-01445A-10-0517

2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

OF

Joseph D. Harris

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EXHIBITS

ARIZONA WATER COMPANY

Direct Testimony of

Joseph D. Harris

I. Introduction and Qualifications

Q. WHAT ARE YOUR NAME, EMPLOYER AND OCCUPATION?

A. My name is Joseph D. Harris. I am employed by Arizona Water Company (the "Company") as Vice President and Treasurer.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I have been Vice President and Treasurer of the Company since March 2007. I received a Bachelor of Science degree in Accounting from Eastern Illinois University in 1981 and I am a Certified Public Accountant in the State of Illinois. From approximately 1982 until 1999, I worked for Northern Illinois Water Company, first as Staff Accountant (from 1986 to 1999) and then as Chief Accountant, where I managed the accounting department and oversaw the company's financial reporting, tax compliance, strategic planning and filings with the Illinois Commerce Commission. From November 1999 until July 2002, I served as Comptroller of Illinois American Water Company, managing the company's accounting and information system departments. From July 2002 until March 2007, I worked for American Water Service Company as Senior Financial Analyst and as Manager for Performance, Planning and Reporting, where I directed and coordinated preparation of the annual business plan and quarterly forecasts, and provided financial expertise on all financial issues. I am also a member of the American Institute of Certified Public Accountants.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide an overview of the filing, recommend the weighted average cost of capital, propose the continuation of the Arsenic Cost Recovery Mechanism ("ACRM"), request the proposed consolidation of the White Tank system with the Pinal Valley water system, propose a Distribution System Improvement Charge ("DSIC") and propose an Off-Site Facilities Fee tariff.

II. <u>Overview of Filing</u>

Q. PLEASE SUMMARIZE THE FILING.

A. The Company filed this application with the Arizona Corporation Commission (the "Commission") to adjust its rates and charges for its Western Group water systems based on operating results and investment in these water systems for the adjusted test year 2009. The requested rates will result in a total revenue increase of $5,097,223 or 26.75 percent over current rates. As of December 31, 2009, the Western Group included three systems, Pinal Valley (Casa Grande, Coolidge and Stanfield), White Tank and Ajo. Together these systems serve approximately 30,400 customers.

The current rates are based on operating results and utility plant investments for the adjusted test year ending December 31, 2007, established as part of Decision No. 71845 in Docket W-01445A-08-0440. Since test year 2007, operating costs and investment in needed utility plant have increased, while customer sales have fallen. In the period between that test year and the adjusted test year ending December 31, 2009, the Western Group rate base has increased by $5,759,844 or 11.1 percent while operating expenses have increased even more dramatically, with costs rising $2,722,356 or 19.6 percent.

Q. WHAT HAS BEEN THE OVERALL EFFECT ON THE COMPANY'S RETURN ON RATE BASE?

A. As shown on page 1, line 8, of Schedule A-1, the Return on Rate Base for the Western Group for 2009 was 5.28 percent, far short of the 7.87 percent authorized in Decision No. 71845.

Q. DOES THIS RETURN INCLUDE THE EFFECTS OF THE NEW RATES ESTABLISHED IN DECISION NO. 71845?

A. Yes. Although the rates authorized in Decision No. 71845 went into effect on July 1, 2010, a pro forma adjustment, more fully explained in Section VI of Mr. Reiker's direct testimony, was made to annualize the new rates.

Q. WHAT STEPS HAS THE COMPANY TAKEN TO IMPROVE ITS FINANCIAL PERFORMANCE?

A. Beginning as early as 2008, the Company began taking steps to avert what it saw as an impending financial crisis by sharply reducing the amount of its capital budget as well as certain operation and maintenance expenses. In early 2009, even more dramatic efforts were made to reduce costs, including, for the first time in the Company's 55 year history, staff reductions. Other cost reduction efforts included a wage and hiring freeze. The capital budget was reduced by fifty-seven percent in 2008 and slashed by an additional thirty-eight percent in 2009. This new "bare bones" capital budget level has been continued through the current year as the Company continues its efforts to control its expenses, debt, and stabilize its earnings.

Q. EVEN WITH THESE REDUCTIONS TO CAPITAL EXPENDITURES AND OPERATING EXPENSES, WILL THE COMPANY RECOVER ITS COST OF SERVICE?

A. No. These steps were taken to stave off a financial crisis while the Company's last rate filing was pending. Even with the rates granted in Decision No. 71845, the Company will not recover its cost of service. This is primarily because rates set in the last general rate case were designed to recover the Company's costs through the adjusted test year 2007. As discussed above, since that time, operating costs and investment in utility plant have risen significantly. Additionally, the Company's response to the financial crisis it is experiencing is not sustainable because, in part, it cut investment and expenses to a level that, if continued will, in the long term jeopardize the Company's ability to provide reliable and adequate service.

Q. IS THE COMPANY MAKING ANY PROPOSALS THAT WOULD HELP TO MITIGATE OR IMPROVE THIS SITUATION?

A. Yes. The Company is proposing continuation of the ACRM for its Western Group systems to help alleviate the financial burden of constructing new government-mandated arsenic treatment facilities to comply with stringent new United States Environmental Protection Agency ("EPA") safe drinking water standards. Additionally, the Company is requesting the adoption of a DSIC that balances fiscal responsibility with customer affordability to assist it in replacing aging infrastructure. Finally, the Company is seeking approval of an Off-Site Facilities Fee tariff to provide the funds needed to construct infrastructure in its growing Pinal Valley water system.

III. Weighted Average Cost of Capital

Q. WHAT IS THE COMPANY'S WEIGHTED AVERAGE COST OF CAPITAL?

A. The Company's weighted average cost of capital is not less than 9.52 percent. This amount is calculated in Schedule D-1 of the application and the method is discussed below.

Q. HOW IS THE WEIGHTED AVERAGE COST OF CAPITAL DETERMINED?

A. The Company's weighted average cost of capital is determined by establishing the cost of the individual capital components, then calculating an overall cost weighted by each capital component's percentage of the total capital structure and individual cost. The Company's pro forma capital structure includes two components: Long-Term Debt and Common Stock Equity.

Q. WHY IS SHORT-TERM DEBT NOT INCLUDED IN THE COMPANY'S PRO FORMA CAPITAL STRUCTURE?

A. In October 2010 the Company's shareholder infused an additional $10,222,000 of equity in the Company. This infusion of additional capital allowed the Company to repay its short-term debt obligation and eliminate short-term debt as of the date of filing this application.

Q. WHY DID THE SHAREHOLDER CHOOSE TO MAKE AN ADDITIONAL CAPITAL INFUSION?

A. In the past five years, the Company undertook construction of water treatment plant facilities at a cost of $35 million to comply with federally-mandated safe drinking water standards. The Company was unable to finance this program with internally generated funds and as a result, issued $35 million in additional long-term debt. During this same period, earnings were in a steady decline and, as a result, common stock equity ratios dropped by nearly forty percent as illustrated in Exhibit JDH-1. At the conclusion of its 2007 test year rate proceeding, the Company was again faced with the prospect of undertaking a massive capital investment program required to replace aging infrastructure and reduce lost and unaccounted for water. The Company is neither able to finance this project with internally generated funds, nor issue additional long-term debt because it is not able to meet the minimum interest coverage ratio required by its General Mortgage Bond Indenture. Faced with continually increasing operating and capital costs, the Company's shareholder recognized the Company's financial predicament and, despite the fact that the Company has failed to recover its cost of service over the past several years, decided that it was imperative to provide additional equity capital.

Q. WHAT EFFECT DOES THE SHARP DECLINE IN EQUITY HAVE ON THE COMPANY?

A. The most obvious effect is the reduction or elimination of the Company's ability to incur debt to finance its much-needed utility plant additions. In the Company's last application for short-term financing the Commission Staff argued against approval of the Company's application due, in part, to its diminished equity position. In its Responsive Staff Report filed in Docket No. W-01445A-08-0607, Staff stated: "In previous cases, the strength of the Company's capital structure allowed Staff to assume that the Company could refinance the line of credit at the end of the financing agreement. Staff concludes that the Company's capital structure is no longer sufficiently strong to continue assuming that the line of credit can be refinanced."

Q. CAN THE COMPANY RELY ON ADDITIONAL SHAREHOLDER INVESTMENTS IN THE FUTURE?

A. No. While the shareholder has stepped forward to halt the continued slide in the Company's equity ratio, it is unrealistic to expect the shareholder to continue to invest millions of dollars in a company that is not able to recover its cost of service and the cost of capital.

Q. WHAT IS THE COST OF LONG-TERM DEBT IN THE CAPITAL STRUCTURE?

A. The cost of long-term debt is set forth in Schedule D-2, page 1. The Company's general mortgage bonds are listed by series with the annual interest and amortization in lines 24 through 26. The Company's computation of its long-term debt cost shown on line 28 is the approach adopted by the Commission in the Company's last five general rate cases. This same method is used by the Company in this rate application. This method shows an unchanging cost for each debt issue and then weights the cost of each individual issue by its percentage of the total debt outstanding.

In summary, at the end of Adjusted Test Year 2009, the Company had long-term debt totaling $75,000,000, at a weighted average embedded cost of 6.82 percent.

Q. HOW DID YOU DETERMINE THE COST OF COMMON EQUITY?

A. The cost of common equity, 12.1 percent, was determined by the Company's expert witness, Dr. Thomas M. Zepp, and is supported by his direct testimony.

Q. DO YOU HAVE AN OPINION AS TO WHAT WOULD BE A FAIR AND PROPER RATE OF RETURN FOR THE COMPANY TO EARN ON ITS ADJUSTED ORIGINAL COST LESS DEPRECIATION RATE BASE?

A. Yes. It should not be less than 9.52 percent, the weighted average cost of capital computed on Schedule D-1.

IV. <u>ACRM Continuation</u>

Q. DOES THE COMPANY NEED TO CONSTRUCT ADDITIONAL ARSENIC TREATMENT PLANTS IN THE WESTERN GROUP?

A. Yes. For the reasons described in Section VI of Mr. Schneider's direct testimony, the Company must construct additional arsenic treatment plants in its Pinal Valley water system, and planning and design for those plants is already underway. These facilities include the expansion of the Company's Henness Road arsenic treatment plant as well as new treatment facilities at Coolidge Well No. 13.

Q. WHAT WILL BE THE FINANCIAL IMPACT ON THE COMPANY AS A RESULT OF CONSTRUCTING THESE FACILITIES?

A. The estimated cost of these additional facilities is approximately $2,400,000. Without the ability to recover the costs associated with these mandated treatment plant investments they will have a significant negative impact on the Company's financial performance. The Company would need $418,000 of additional revenues just to recover the capital costs associated with these additional facilities and would not include additional costs for arsenic treatment related operating costs. An exhibit showing the revenue requirement based on the estimated cost of these additional facilities is attached as Exhibit JDH-2.

Q. HAS THE COMMISSION AUTHORIZED CONTINUATION OF THE ACRM FOR ANY OF THE COMPANY'S OTHER SYSTEMS?

A. Yes. In Decision No. 71845 the Commission authorized the Company to make new ACRM filings for arsenic treatment plants that were planned for construction in its Sedona and Superstition systems. The Company is proposing that the authorization granted in Decision No. 71845 be extended to the Western Group in this proceeding.

V. System Consolidation

Q. IS THE COMPANY PROPOSING TO CONTINUE WITH ITS PLAN TO CONSOLIDATE ADDITIONAL SYSTEMS IN THIS PROCEEDING?

A. Yes. Consistent with the Company's Consolidation Study, which the Commission required the Company to prepare in Decision No. 71845, attached hereto as Exhibit JDH-3, the Company proposes to operationally consolidate the White Tank water system into the Pinal Valley water system.

Q. PLEASE DESCRIBE WHAT FUNCTIONS WOULD BE OPERATIONALLY CONSOLIDATED.

A. Operational consolidation refers to the consolidation of the following functions: accounting, regulatory, operations and ratemaking. The Company is proposing to consolidate the accounting records, operations, regulatory and ratemaking functions of the two systems effective with the date of the Commission's decision in this proceeding. Because full consolidation of all of the rates of these two systems is not possible at this time, the Company is proposing a phased consolidation of the Pinal Valley and White Tank water systems.

Q. WHAT ARE THE COMPANY'S CONSOLIDATION PRINCIPLES?

A. The Company's consolidation principles, which were adopted by the Commission in Decision No. 71845 and detailed in the Consolidation Study, include:

1. Rate consolidation should produce average residential bills that are at or below the cost of service.

2. Changes to rate design should reflect gradualism.

3. Operational consolidation (which would include regulatory, accounting, operations, and ratemaking functions) should be implemented when the Commission approves the consolidation.

4. Rates should be consolidated partially where full rate consolidation is not yet feasible.

5. Systems with higher rates should have their rates frozen until the rates in the other systems in that consolidated group reach that level.

6. Consolidation is ideally made along functional relationships which share management, operating employees and customer service.

7. Areas consolidated should share similarities in water resources.

8. Areas consolidated should have similar rate structures.

Q. WHAT ARE THE BENEFITS OF CONSOLIDATING SYSTEMS FROM A RATEMAKING PROSPECTIVE?

A. There are a number of benefits that rate consolidation will bring to these water systems, the customers and the Company that were enumerated in the Consolidation Study. Primary among these benefits are:

1. Mitigate rate impacts to customers by smoothing the effect of discrete cost spikes across systems.

2. Improve affordability of service in smaller systems.

3. Achieve value of service equity to the extent that all customers pay the same price for comparable service.

4. Improve overall operational efficiency by encouraging investment in the consolidated systems based on need without being hindered by an individual system's inability to earn its return on the investment.

5. Streamline administrative and regulatory processes, thereby lowering costs, especially costs related to ratemaking and accounting.

6. Improve and further ensure affordability of water service in all systems.

Q. ARE THESE BENEFITS THE MAIN REASONS THAT THE COMPANY IS PROPOSING CONSOLIDATION OF THE WHITE TANK AND PINAL VALLEY WATER SYSTEMS?

A. Yes, they are.

Q. PLEASE SUMMARIZE THE CONSOLIDATION THAT THE COMPANY IS PROPOSING.

A. The Company is proposing a phased consolidation of the White Tank and Pinal Valley water systems consistent with the rate consolidation principles in the Company's Consolidation Study. These two systems share a common regional water resource, management, operating employees and customer service. Full consolidation is proposed for residential and commercial rates in the two systems. While industrial rates will be a phased consolidation with monthly minimums for the White Tank system set to equal those set for the Pinal Valley system. The White Tank system will retain separate industrial commodity rates until a future rate proceeding.

Q. HAS THE COMPANY PERFORMED A COST OF SERVICE STUDY THAT SUPPORTS THE COMPANY'S CONSOLIDATION EFFORTS?

A. Yes. As detailed in Section VII of Mr. Reiker's direct testimony, the Company conducted a cost of service study. The rate design the Company is proposing for the partial consolidation of the White Tank and Pinal Valley water systems, produces revenues that are equal to or below the residential cost of service, thus avoiding the type of residential subsidies that often result when separate water systems are consolidated for rate purposes.

Q. WHAT IS THE STATUS OF THE COMPANY'S PLAN TO CONSOLIDATE RATES FOR ITS CASA GRANDE, COOLIDGE AND STANFIELD SYSTEMS?

A. In Decision No. 71845, the Commission authorized the full rate consolidation of Casa Grande and Coolidge ("Pinal Valley"). Stanfield's rates were partially consolidated in that proceeding and the Company's proposal in this application is to continue to bring Stanfield's commodity rates a step closer to those of Pinal Valley's. The Company proposes this approach because the disparity in rates is such that full consolidation at this time would result in an undue decrease in the average bill for residential customers in Stanfield, thus sending a conflicting price signal that undermines the Company's conservation efforts. This approach is also consistent with the principle of gradualism identified in the Company's Consolidation Study.

VI. DSIC

Q. BRIEFLY DESCRIBE WHAT YOU MEAN BY A DSIC.

A. A DSIC is a ratemaking tool that allows utilities to recover the fixed costs (depreciation and return) of non-revenue producing distribution system improvement projects completed between rate cases. Mr. Garfield discusses the public policy aspects of a DSIC program in his direct testimony.

Q. ARE THERE OTHER JURISDICTIONS WHERE DSIC-TYPE MECHANISMS ARE ALREADY IN PLACE?

A. Yes. Many jurisdictions including Delaware, California, Connecticut, Pennsylvania, Indiana, Illinois, Missouri, New York and Ohio have adopted DSIC-type mechanisms to finance ongoing replacement of aging and deteriorating water distribution networks. In addition, DSIC programs have been cited by the National Association of Regulatory Utility Commissioners ("NARUC") as a "Best Practice".

Q. HAS A DSIC EVER BEEN APPROVED IN ARIZONA?

A. Not yet. However, in Docket No. W-01303A-05-0405, the Commission adopted a Public Safety Surcharge in Paradise Valley. This type of surcharge was specifically designed to provide funding of expenditures to replace undersized and inadequate mains in the Town of Paradise Valley. The DSIC, however, is more like the ACRM which was developed through joint efforts of the Company, Staff and the Residential Utility Consumers Office ("RUCO"). The ACRM allows utilities that have constructed arsenic treatment plants to seek recovery of capital costs and narrowly defined components of operating costs of arsenic treatment plants between formal rate filings. Without this proactive recovery method, a significant number of the State's utilities would not have been able to comply with new safe drinking water standards and as a result these utilities, including the Company, would have been placed in a precarious financial position.

Q. HAS THE COMMISSION EXPRESSED AN OPINION ON THE DSIC?

A. Yes. In Decision No. 71845 the Commission stated that an infrastructure funding mechanism (DSIC) may be reasonable for certain of the Company's aging infrastructure or infrastructures that face other unique challenges. The Commission further stated its belief that it was appropriate for the Company to further develop this issue for future consideration by preparing a study and filing a report on DSIC, and to utilize the information from that study to inform the Commission of further proposals in its future rate cases.

Q. WAS THE REQUIRED DSIC STUDY FILED WITH THE COMMISSION?

A. Not yet, but it will be filed by the June 30, 2011 compliance deadline. The Company has prepared an initial form of the DSIC study that details the history of the DSIC, the need for distribution system improvements, the cost of those improvements, the potential rate impacts and the balance between costs and benefits for customers. A copy of that initial form of study is attached as Exhibit JDH-4.

Q. DID THE INITIAL FORM OF THE DSIC STUDY CONCLUDE THAT DETERIORATING OR AGING WATER DISTRIBUTION SYSTEMS WERE PRIMARILY AN EAST COAST PROBLEM?

A. No. As discussed in the initial form of the DSIC study, the EPA report titled, "Drinking Water Infrastructure Needs Survey and Assessment, Fourth Report to Congress" shows a twenty year national capital improvement need of $334.8 billion. As shown in Exhibit JDH-5 of this report, Arizona's water systems are projected to have infrastructure needs over the next twenty years of nearly $7.5 billion, with $3.7 billion of that need being in transmission and distribution systems. The EPA report also categorized these capital needs by system size. Using the system sizes from the report, the Company's 19 water systems are classified as medium or small systems. For systems of this size, the report identified water system infrastructure needs in Arizona of $2.1 billion for medium-sized systems and $889 million for small systems. As discussed in Section X of Mr. Schneider's direct testimony, the Company is taking direct action to address water losses and has prepared a detailed study of its distribution systems to determine the sources of water losses and the best approach to help reduce such water losses[1]. The results of that study indicate that the Company is facing an infrastructure crisis arising from the fact that over 287,000 feet of the water mains in the Pinal Valley water system are in critical need of replacement to maintain system integrity and to continue to provide reliable and adequate water service. Without these necessary replacements, the Company will experience increasing breaks, leaks and water losses caused by failing infrastructure.

Q. CAN THESE REPLACEMENTS BE HANDLED AS PART OF THE COMPANY'S NORMAL RENEWALS AND REPLACEMENTS?

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[1] The study titled "Water Loss Reduction Program" is attached to Mr. Schneider's direct testimony as Exhibit FKS-10

A. No. In the last ten years the Company's rate of water main replacement in the Pinal Valley system is 5,900 feet per year. Based on the need identified above it would take over 48 years to be able to replace the 287,000 feet of water mains identified in the detailed system analysis. Additionally, the Company has identified 3,700 failing plastic services that need to be replaced to reduce water loss. The preliminary cost estimate of these replacements is nearly $41,000,000 as shown in the table below:

QUANTITY	DESCRIPTION	ESTIMATED COST
14,800	Replace Failing Water Mains 1920 - 1929	$ 736,880
7,116	Replace Failing Water Mains 1930 - 1939	$ 301,470
246,150	Replace Failing Problematic Water Mains 1940 and later	$ 11,205,230
19,304	Replace Failing Large Diameter Water Mains	$ 2,386,230
3,500	Replace Services on Failing Water Mains	$ 7,700,000
3,700	Replace Failing Plastic Services	$ 8,140,000
(1) **SUBTOTAL - MATERIALS AND LABOR**		$ 30,469,810
(2) PERFOMANCE BONDS, SURVEYING, RIGHT OF WAY PERMITTING, TESTING, FIELD INSPECTION AND OVERHEAD		$ 10,524,272
ESTIMATED COST OF CONSTRUCTION		**$ 40,994,082**

Based on its current limited financial resources, the Company simply does not have the ability to fund the type of infrastructure replacement program required to ensure the long-term viability and reliability of the Company's distribution system. Although these types of programs enable a utility to provide reliable and adequate water service, they do not generate additional sales or revenue. To be more precise, these types of replacements add to the Company's cost of providing service but they do not add any additional revenue to recover those costs.

As discussed earlier in this testimony, the Company is in critical financial condition due to rising costs and declining customer sales and, in fact, is not able to issue additional long-term debt because it is unable to meet the minimum interest coverage ratio provision of its General Mortgage Bond Indenture.

Not only is the Company unable to meet the interest coverage ratios in the Indenture but it has been unable to recover its cost of service for a number of years. The infrastructure replacement program needed to ensure the integrity of its distribution system would simply add to the Company's debt (if it could fund such debt) and increase costs that cannot be recovered under current rates. This type of much-needed infrastructure replacement program cannot be undertaken without a change in the way these costs are recovered.

Q. ARE THERE RATEMAKING STRATEGIES THAT COULD BE EMPLOYED OTHER THAN ESTABLISHING A DSIC?

A. Other than basing rates on a future test year, no. When a utility is faced with a large capital project, its cost and construction timeline are usually well known in advance. With that knowledge, the utility can time its rate case filing to coincide with completion of the facility to minimize the amount of earnings erosion. But the infrastructure replacement program needed by the Company does not lend itself to that type of timing strategy because it is made up of many smaller projects that will be constructed each year for a number of years. Most of these projects would likely have a very short construction timeline, meaning that they would either not qualify for accrual of Allowance for Funds Used During Construction ("AFUDC"), or the amount of AFUDC recorded would be very small. Because these replacement programs do not increase sales or revenues and since they will not accrue AFUDC, they neither generate cash returns nor AFUDC accruals. In order to generate any cash flow to support this type of program, the Company would be forced to file for annual rate increases to coincide with its capital expenditures, even though the ratemaking process takes longer than one year to complete. Even if this were possible, the amount of time and the cost of prosecuting annual rate cases would cause further earnings erosion and make the strategy unworkable.

Q. WHAT ARE THE ELEMENTS OF THE COMPANY'S PROPOSED DSIC?

A. As identified in the Company's initial form of the DSIC study, the following elements comprise the Company's proposed DSIC:

1. The DSIC will recover the fixed costs associated with DSIC-eligible utility plant additions net of retirements placed in service between rate cases. Utility plant additions eligible for the DSIC will be limited to those additions which are properly classified in the following NARUC Uniform System of Accounts for Class A and B Water Utilities (1976).

343 – Transmission and Distribution Mains

344 – Fire Mains

345 – Services

346 – Meters

347 – Meter Installations

348 – Hydrants

2. The DSIC will be filed on a semi-annual basis to reflect eligible utility plant additions placed in service during the six-month period ending two months prior to each DSIC update as illustrated below:

Effective Date Of Update	Period In Which DSIC-Eligible Plant Additions Made
July 1	November 1 – April 30
January 1	May 1 – October 31

3. Supporting data, as described below, for each semi-annual filing will be filed with the Commission at least 30 days prior to the effective date of the update. Exhibit JDH-6 contains examples of the following schedules:

Schedule 1: The Company's most recent balance sheet at the time of filing for a DSIC step increase.

Schedule 2: The most recent income statement for the Company and those systems for which the Company requests a DSIC step increase.

Schedule 3: An earnings test schedule for each system where the Company is requesting a DSIC step increase. The earnings test will reflect the Company's most recent financial data.

Schedule 4: A rate review schedule for each system showing the incremental and pro forma effects of the step increase associated with the eligible DSIC capital costs on the financial data provided in Schedules 2 and 3.

Schedule 5: A revenue requirement schedule showing the calculation of the required increase related to eligible DSIC capital costs for each system. The schedule will also indicate the current incremental increase, proposed monthly fixed basic service and volumetric charges for a customer with a 5/8 x 3/4-inch meter. The required rate of return, gross conversion factor and depreciation rate would be the same rates approved in that system's last rate case.

Schedule 6: A schedule showing the surcharge calculation for eligible DSIC capital costs for each system. Fifty percent of recoverable capital costs will be in the form of a monthly fixed surcharge and fifty percent will be in the form of a volumetric surcharge. The monthly fixed surcharge will be scaled to each meter size based on the approved 5/8 x 3/4-inch equivalent capacity ratio. This schedule will also provide information related to the number of customers by meter size and the number of gallons sold.

Schedule 7: A rate base schedule for each system showing the rate base determined in the most recent rate case as well as the most recent rate base calculated as of the date of the information provided in Schedules 1 and 2, both adjusted to reflect the inclusion of completed and in-service eligible DSIC facilities.

Schedule 8: A Construction Work In Progress ledger showing monthly charges related to the construction of eligible DSIC facilities.

Schedule 9: A schedule showing the calculation of the Company's three-factor allocation methodology.

Schedule 10: A typical bill analysis comparing bills for customers with a 5/8 x 3/4-inch meter under present and proposed rates.

4. The DSIC surcharge will be shown as a separate line item on each customer's bill. At least twice per year, the Company will print a message on each customer's bill which explains the DSIC surcharge and indicates the progress being made on replacing aging infrastructure.

5. The DSIC will be phased in each year and capped at 7.5 percent of the annual amount billed to customers under otherwise applicable rates and charges.

6. The DSIC will be reset to zero, as of the effective date of each new general rate case, by inclusion of the DSIC-eligible plant in rate base used to set base rates in the general rate case approved by the Commission. Thereafter, new DSIC-eligible utility plant additions not included in the general rate case will form the basis for the new semi-annual DSIC filing. No DSIC filing will be made if, in any semi-annual period, the system for which the filing would otherwise be made is earning a rate of return that exceeds the rate of return that would be used to calculate the revenue requirement under the DSIC.

Q. HAS THE COMPANY PREPARED AN EXAMPLE CALCULATION OF THE DSIC USING THE COMPANY'S ENGINEERING COST ESTIMATE OF $2.5 MILLION TO REPLACE AGING INFRASTRUCTURE?

A. Yes. A worksheet for the Pinal Valley water system showing the calculation of the revenue requirement for an infrastructure investment of approximately $2.5 million and the impact on a typical residential monthly bill is attached as Exhibit JDH-7.

Q. WHAT IS THE ESTIMATED EFFECT ON AN AVERAGE RESIDENTIAL BILL FROM THE DSIC SURCHARGE?

A. Based on the water main and service line replacement program described in Section X and Exhibit 10 of Mr. Schneider's direct testimony, at an estimated annual cost of $2.5 million, the Company estimates that the impact on a typical residential customer's monthly bill in Pinal Valley would be $0.99. Even at the maximum capped amount of 7.5 percent, the average monthly residential bill would not increase by more than $2.89.

Q. HOW DOES A DSIC BENEFIT CUSTOMERS?

A. There are a number of customer benefits highlighted by the initial form of the DSIC study. Primary among them are improved water quality and fire protection, decreased water loss, increased water pressure, fewer service interruptions, and the potential for a longer period of time between general rate cases, thus leading to greater rate stability and lower rate case expenses.

Failing distribution infrastructure causes a number of customer service issues such as degradation of water quality and service interruptions. Service interruptions can affect hundreds of customers when water mains fail. Additionally, leaking water mains and services result in millions of gallons of treated water failing to reach customers every year. While the Company's leak detection and repair program has made progress in reducing the amount of water lost to leaks, the DSIC being proposed by the Company is a way to make real progress in improving the integrity and reliability of its distribution systems and take positive steps forward in eliminating customer outages caused by distribution system failures.

Implementation of the DSIC will provide the necessary financial resources for the Company to invest in replacing its aging infrastructure and allow it to make these investments in incremental steps. Additionally, implementing a DSIC will limit the rate impact on customers to small, regular increases rather than large irregular increases that make customer affordability and acceptance more difficult.

VII. Off-Site Facilities Fee

Q. WHAT IS THE PURPOSE OF THE OFF-SITE FACILITIES FEE?

A. The purpose of the Off-Site Facilities Fee is to equitably apportion the costs of constructing additional off-site facilities to provide water production, treatment, delivery, storage and pressure facilities among all new customers whose water supply requirements make these facilities necessary. The fee would be applicable to all new service connections in the service area.

Q. WHAT IS THE AMOUNT OF THE PROPOSED FEE?

A. The proposed fee is $3,500 for each new service connection with a 5/8 x 3/4-inch meter, and is graduated in amount for larger meter sizes. Exhibit JDH-8 shows the estimated funds needed by meter size and a projection of the amount collected and expended to construct the necessary off-site facilities.

Q. HOW DID THE COMPANY ARRIVE AT THIS AMOUNT?

A. The Company arrived at this amount by determining the cost, in current dollars, of off-site infrastructure facilities that will not be provided by developers, and dividing it by the number of new 5/8 x 3/4-inch meter equivalents.

Q. HAS THIS TYPE OF FEE BEEN APPROVED BY THE COMMISSION BEFORE?

A. Yes. Off-site facilities fees have been approved in Docket Nos. W-01303A-05-0718, W-02859A-99-0101, W-02234A-00-0706 and WS-02987A-99-0745.

Q. WOULD THIS FEE BE A REPLACEMENT FOR ADVANCES OR CONTRIBUTIONS IN AID OF CONSTRUCTION THAT ARE TYPICALLY ASSOCIATED WITH EXTENDING OR PROVIDING WATER INFRASTRUCTURE FACILITIES?

A. No. This fee is intended to fund off-site facilities which would be in addition to an applicant's advance or contribution of the cost of extending and providing on-site water infrastructure facilities to the applicant's premises or development.

Q. WHAT FACILITIES DOES THE COMPANY INTEND TO FUND WITH THIS OFF-SITE FACILITIES FEE?

A. The facilities, more thoroughly discussed by Mr. Schneider in Section VIII of his direct testimony are primarily the Pinal Valley Regional CAP Plant and the necessary transmission and distribution mains, water storage tanks and booster stations needed to provide water service in this growing area, that are not otherwise supported by developer contributions.

Q. WHEN DOES THE COMPANY PLAN TO CONSTRUCT THESE FACILITIES?

A. The preliminary schedule of construction is detailed by Mr. Schneider in his direct testimony. It is the Company's policy that construction of a particular phase will not commence until sufficient off-site facilities fees have been collected to offset the costs associated with that phase. This will eliminate the possibility that the Company will face large off-site infrastructure investments that are not fully funded by contributions, which would lead to large increases in rate base and ultimately rates.

Q. DOES THIS MEAN THAT NO PLANT WILL BE CONSTRUCTED UNTIL ALL OFF-SITE FACILITIES FEES HAVE BEEN COLLECTED?

A. No. As shown on the facilities phasing schedule, off-site facilities will be constructed in phases to serve customers long before the actual surface water treatment plant is constructed. As indicated above, construction of these preliminary phases will be fully funded in advance of actual construction.

Q. HOW WOULD THE OFF-SITE FACILITIES FEES COLLECTED BE ACCOUNTED FOR?

A. When fees are received from developers, the amounts would be recorded in an off-site facilities fees deferred liability account. Once the off-site facilities are constructed with these fees and placed in service, the equivalent amount will be transferred from the deferred liability account to Contributions in Aid of Construction ("CIAC").

Q. WOULD IT BE APPROPRIATE TO OFFSET RATE BASE WITH UNEXPENDED FEES?

A. No. Since these fees are not available to the Company, except for the purpose of constructing off-site facilities, it would not be appropriate to include these unexpended fees as either CIAC or as a reduction to the cash working capital component of rate base, as they are not available for the Company's use except to build off-site facilities.

Q. HOW DOES THIS FEE COMPARE TO THE SAME TYPES OF FEES CHARGED BY OTHER COMPANIES AND MUNICIPALITIES?

A. Exhibit JDH-9 shows that the Company's proposed fee is at the midpoint of similar fees charged in communities similarly located.

Q. WHAT IS THE FORM OF TARIFF FOR THIS FEE?

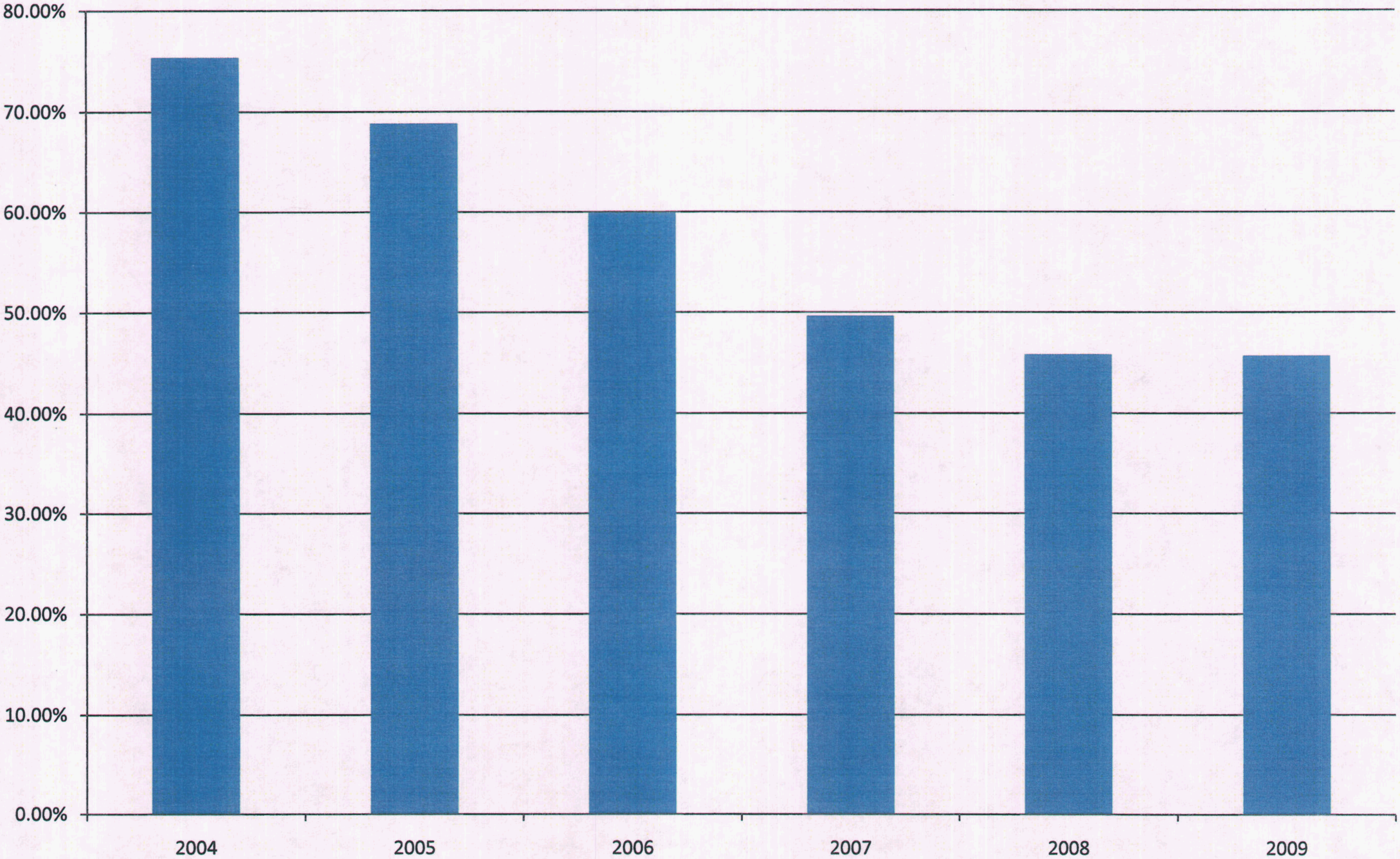
A. The proposed tariff is attached as Exhibit JDH-10.

Q. DOES THAT CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

JDH-1

Arizona Water Company Common Equity Ratio 2004 - 2009



JDH-2

ARIZONA WATER COMPANY
DOCKET NO. W-01445A-10-XXXX
REVENUE REQUIREMENT
AS OF DECEMBER 2009

Line No.		[A]	[B]	[C]	[D]
1		PINAL			
2	Arsenic Compliance Revenue Requirement:	VALLEY			
3					
4	Test Year Data:				
5	Arsenic Plant in Service (Sch. 8, p. 1)	$ 2,400,000			
6	Accumulated Depreciation	-			
7	Arsenic Rate Base	$ 2,400,000			
8	Required Rate of Return	9.52%			
9	Required Operating Income	$ 228,480			
10	Gross Revenue Conversion Factor	1.62860			
11	Revenue Required - Return on Arsenic Treatment Plant	$ 372,103			
12	Depreciation on Arsenic Treatment Plant (Sch. 8, p. 1)	$ 46,000			
13					
14	Revenue Required - Capital Costs (Ln. 11 + Ln. 12 + Ln. 13)	$ 418,103			
15					
16	Revenue Required - Capital Costs & Recurring O&M Expenses (Ln. 14 + Ln. 15)	$ 418,103			
17	Revenue Required - Deferred O&M Expenses	$ -			
18	Total Revenue Required - Step 1 (Ln. 16 + Ln. 17)	$ 418,103			
19					
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JDH-3

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

KRISTIN K. MAYES - Chairman
GARY PIERCE
PAUL NEWMAN
SANDRA D. KENNEDY
BOB STUMP

RECEIVED

2010 SEP 30 P 4: 37

DOCKET CONTROL

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 AND FOR CERTAIN RELATED APPROVALS BASED THEREON.	Docket No. W-01445A-08-0440 **CERTIFICATE OF COMPLIANCE FILING**

In Decision No. 71845 of the Arizona Corporation Commission (the "Commission") entered on August 24, 2010, in the above-captioned docket, the Commission ordered Arizona Water Company (the "Company"), at page 94 of the Decision, to "... prepare a study outlining consolidation proposals, inclusive of a full-system-wide single-tariff consolidation option, which details possible timelines and pursues paths of least impact for customers...and file a report detailing the results of the study by June 30, 2011, but no later than three months prior to filing its next rate case with Docket Control as a compliance item in this docket...".

The Company hereby files its Consolidation Study in compliance with the foregoing order.

RESPECTFULLY SUBMITTED this 30th day of September 2010.

ARIZONA WATER COMPANY

By: Robert Geake

Robert W. Geake
Vice President and General Counsel
Arizona Water Company
P. O. Box 29006
Phoenix, AZ 85038
Attorney for Applicant

AN ORIGINAL and thirteen (13) copies of the foregoing filed this 30th day of September, 2010 with:

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

A copy of the foregoing was mailed this 30th day of September, 2010 to:

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Assistant Chief Administrative Law Judge
Hearing Division
Arizona Corporation Commission
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By: Robert Geake

Arizona Water Company
Consolidation Study
Docket W-01445A-08-0440
September 30, 2010

In Decision No. 71845, the Arizona Corporation Commission (the "Commission") directed Arizona Water Company ("Company") to prepare a study outlining consolidation options, including an option for full, system-wide, single-tariff consolidation. A report of the study is to be filed with the Commission by June 30, 2011, but no later than 90 days prior to filing its next rate case. This consolidation study complies with Decision No. 71845 and addresses the following: (1) two different consolidation options; (2) impacts on residential customers; (3) possible timelines for implementation; and (4) potential efficiencies from consolidation.

The Company is a public service corporation engaged in providing public utility water service in portions of Cochise, Coconino, Gila, Maricopa, Navajo, Pima, Pinal and Yavapai Counties, Arizona, pursuant to certificates of convenience and necessity granted by the Commission. Currently, the Company operates 19 water systems which serve approximately 84,500 customers.

The Company's 19 water systems are organized into three groups: Northern, Eastern and Western. In Decision No. 58120, the Commission expressly authorized the Company to implement and utilize the three groups for filing rate applications to simplify processing and increase administrative efficiency. For management purposes, these three groups are further subdivided into six divisions, 11 systems and 13 sub-systems. Each division shares managerial, operating and customer service employees within each water system they manage. Additionally, the water systems within each division are located in the same general area of the state and share similarities in water resources. The chart below shows each of the systems by division and group. Note that several divisions have been renamed to better identify consolidated systems within the divisions.

Arizona Water Company
Consolidation Study
Docket W-01445A-08-0440
September 30, 2010

Group	Division	System (• Sub-system)
Northern Group		
	Navajo Division	
	(formerly Lakeside Division)	Navajo • Lakeside[1] • Overgaard[1]
	Verde Valley Division	
	(formerly Sedona Division)	Verde Valley • Sedona[2] • Rimrock[1] • Pinewood[1]
Eastern Group		
	Superstition Division	
		Superstition • Apache Junction[1] • Superior[1] • Miami[1]
	Cochise Division	
	(formerly Bisbee Division)	Cochise • Bisbee[2] • Sierra Vista[2]
	Falcon Valley Division	
	(formerly San Manuel Division)	San Manuel
		Oracle
		SaddleBrooke
		Winkelman
Western Group		
	Pinal Valley Division	
	(formerly Casa Grande Division)	Pinal Valley • Casa Grande[1] • Coolidge[1] • Stanfield[2]
		White Tank
		Ajo

[1]Fully consolidated in Decision No. 71845
[2]Partially consolidated in Decision No. 71845

Prior to Decision No. 71845, these 19 systems and sub-systems all had separate rates. However, in Decision No. 71845, the Commission authorized five full system consolidations and three partial consolidations, thereby reducing the number of separate systems for rate purposes from 19 to 14. When the current partially consolidated systems achieve full consolidation, the number of systems with separate rates will be reduced to 11.

Study Methodology and Company's Consolidation Principles

To develop the options in this study, the Company relied on the same rate design model that it used in Docket W-01445A-08-0440, which the Commission adopted in Decision No. 71845. The starting point for the comparison is the current rate for each system that was determined using a 2007 test year. The options were developed on the basis of a 2009 test year, to reflect the effects of the Company's greater investment in utility plant, higher operating expenses, and more up-to-date customer counts than in the recently adopted 2007 test year.

In Decision No. 71845, the Commission approved the Company's proposed rate consolidation which was based on the following principles:

- Rate consolidation should produce average residential bills that are at or below the cost of service.[1]
- Changes to rate design should reflect gradualism.[2]
- Operational consolidation (which would include regulatory, accounting, operations, and ratemaking functions) should be implemented when the Commission approves the consolidation.
- Rates should be consolidated partially where full rate consolidation is not yet feasible.
- Systems with higher rates should have their rates frozen until the rates in the other systems in the consolidated group reach that level.
- Consolidation is ideally made along functional relationships which share management, operating employees, and customer service.[3]
- Areas consolidated should share similarities in water resources.
- Areas consolidated should have similar rate structures.

[1] Docket W-01445A-08-0440 Direct Testimony of Joseph D. Harris, pg, 14, lines 1-9
[2] Docket W-01445A-08-0440 Direct Testimony of Joel M. Reiker, pg, 35, lines 6-25
[3] Docket W-01445A-08-0440 Direct Testimony of William M. Garfield, pg, 34, lines 1-8

The Company followed these same principles in formulating the consolidation options in this study.

The Consolidation Options

Option 1: Company Proposed – Continue Consolidating Within Systems in Phases

A. Northern Group
   i. The Navajo system would remain fully consolidated.
   ii. Verde Valley system (Sedona, Rimrock, Pinewood)
      a. Fully consolidate rates in phases until all sub-systems' rates can be equalized without rate reductions
B. Eastern Group
   i. The Superstition system would remain fully consolidated.
   ii. Cochise system (Bisbee, Sierra Vista)
      a. Fully consolidate rates in phases until both sub-systems' rates can be equalized without a rate reduction
   iii. Falcon Valley Division (San Manuel, Oracle, SaddleBrooke, Winkelman)
      a. Fully consolidate all systems in the Division operationally
      b. Fully consolidate rates in phases until all systems' rates can be equalized without rate reductions
C. Western Group
   i. Pinal Valley system (Casa Grande, Coolidge, Stanfield)
      a. Operationally consolidate the White Tank system into the Pinal Valley system
      b. Fully consolidate rates in phases until all sub-systems' rates can be equalized without rate reductions
   ii. Ajo system
      a. The Ajo system to remain operationally unconsolidated and will continue to have separate rates because it does not share similarities in water resources with the other systems in the Pinal Valley Division.

All of the Option 1 consolidations would occur along functional lines and combine sub-systems that share management, operations and customer service employees. The partial rate consolidations were created to minimize the impact on customers while still charting a path towards eventual full rate consolidation within a system.

Table 1 shows the Option 1 effect on monthly water bills for residential customers with a ⅝" x ¾" meter using 7,500 gallons of water per month and the annual revenue effect on each system.

Timeline and Customer Impact

Option 1 consolidations could begin with the Company's next rate filing. The Company will be filing the Western Group first, followed annually by the Eastern Group, then the Northern Group. If regulatory timelines for rate case proceedings are followed, the consolidations could be accomplished in four years. Option 1 produces typical residential bills that are equal to or less than the cost of service with the least impact on customers.

Option 2: Statewide Consolidation – Fully Consolidate All Systems

Option 2 of the study examined consolidating all of the Company's systems with a single set of statewide tariff rates for all systems. In many instances, Option 2 consolidation crosses management and operating lines, thereby requiring significant restructuring of the Company's management teams. Also, it would detrimentally alter customer water use patterns and encourage excessive water use by customers in the Northern Group systems which have limited groundwater supplies.

Table 1 shows the Option 2 effect on monthly water bills for residential customers with a ⅝" x ¾" meter using 7,500 gallons of water per month and the annual revenue effect on each system.

Timeline and Customer Impact

Option 2 consolidations could only be implemented with a Company-wide rate filing. If regulatory timelines for rate case proceedings are followed, full operational consolidation could be accomplished within a single three-year ratemaking cycle. Unlike Option 1, this consolidation option produces revenues that exceed the residential cost of service for several systems (Sierra Vista, Winkelman and Sedona). It also causes significantly larger revenue imbalances between a number of the consolidated systems which would cause the Pinal Valley system (Casa Grande, Coolidge, and Stanfield) to be burdened by more than $4 million in additional revenue requirements. Those additional revenues would be reallocated from the remaining systems, which would then have unjustifiably reduced rates. Besides the significant residential customer rate impacts, Option 2 deviates from and undermines the greater functional, operational, and managerial efficiencies achievable under Option 1. Option 2 is not desirable because it causes significant revenue imbalances between some of the systems (because of unjustifiable rate reductions) and encourages higher customer water use in systems where water supplies are scarce.

Benefits of Consolidation

Benefits of rate consolidation for customers, regulators, and the Company as a whole, depend upon the approaches taken in consolidating systems. Primary among these benefits are:

- Mitigate rate impacts to utility customers by smoothing the effect of discrete cost spikes across systems and over time.
- Improve affordability of services in smaller systems.
- Achieve value of service parity to the extent that all customers in a specific geographic area pay the same rates for comparable service.
- Improve overall operational efficiency by encouraging utility plant investments in systems based on need and not based on whether an individual system could sustain the resulting costs of such investments.
- Streamline administrative and regulatory processes, thereby producing efficiencies that minimize costs, especially costs related to accounting and ratemaking.
- Improve and further ensure affordability of water service in all systems.

Efficiencies through Consolidation

Consolidating systems operationally offers a number of efficiencies which can produce long-term gains in productivity. These gains primarily are achieved by eliminating the need to maintain detailed cost records at a discrete individual system level and will result in significant reductions in employee man-hours each day. For example, consider the 125 employees who typically are involved in this type of operational reporting for payroll and invoice coding in the three groups. Assuming that each of these employees will save as little as 12 minutes every work day (which is a conservative assumption), the Company would achieve 25 hours per day in increased productivity. If a typical work year is 240 work days (excluding holidays and vacations), the Company would realize a productivity gain of 6,000 hours over the course of a year. Consolidating accounting records would lead to similar productivity gains. By consolidating systems, the number of cost reports, schedules and analytics is reduced. Assuming two hours saved per system per month, each consolidation of a system could lead to a productivity gain of 72 hours per year company-wide.

The regulatory and ratemaking process is another area where significant savings can be achieved. Of the Company's general rate case legal costs incurred in this Docket, approximately $18,000 were related to consolidation. Though likely to recur in future cases involving consolidation, these costs will decline and eventually be eliminated.

Also in this Docket, the Commission Staff required an additional 90 days to process the rate filing, in part due to the number of separate rate systems, and Staff and other parties required an additional four weeks of time to prepare rate-related testimony. In total, this represented four months of additional effort. Even achieving a 50% reduction in this effort would yield a substantial productivity gain for the Commission itself.

Conclusion

The Company remains committed to consolidations following a principled and conservative approach, having first proposed consolidations in its 2000 rate case for its Northern Group systems – Sedona, Rimrock, Pinewood, Lakeside and Overgaard. The Company's consolidation principles, which the Commission affirmed in Decision No. 71845, should be applied as guidelines in pursuing a path to further consolidations. For this reason, the Company recommends the consolidation strategy outlined in Option 1, which it will begin pursuing in its next rate case. Option 1 continues the work started in Decision No. 71845 and extends it in a logical and reasonable manner. It is preferable to Option 2 because, as the Commission required in Decision No. 71845 (page 94, line 13) it "pursues paths of least impact for customers."

Arizona Water Company
Consolidation Study
Docket W-01445A-08-0440
September 30, 2010

Arizona Water Company
Consolidation Study
W-01445A-08-0440

Table 1

Line No.	System / Sub-system	Monthly Residential Bills[1] Current	2009 Test Year Option 1	2009 Test Year Option 2	System / Sub-system	Annual Revenue Effect (From) / To Option 1	Annual Revenue Effect (From) / To Option 2
	Northern Group				**Northern Group**		
1.	Navajo System				Navajo System		
2.	Lakeside / Overgaard	$ 48.57	$ 50.81	$ 38.81	Lakeside / Overgaard	$ -	$ (484,950)
4.	Verde Valley System				Verde Valley System		
5.	Sedona	$ 36.31	$ 43.01	$ 38.81	Sedona	$ 248,837	$ (365,084)
6.	Rimrock / Pinewood	$ 52.33	$ 52.33	$ 38.81	Rimrock / Pinewood	$ (248,837)	$ (618,891)
7.							
8.	**Eastern Group**				**Eastern Group**		
9.	Superstition System				Superstition System		
10.	Apache Junction / Superior / Miami	$ 37.20	$ 42.90	$ 38.81	Apache Junction / Superior / Miami	$ -	$ (1,683,135)
11.	Cochise System				Cochise System		
12.	Bisbee	$ 44.44	$ 44.44	$ 38.81	Bisbee	$ (258,963)	$ (481,864)
13.	Sierra Vista	$ 25.11	$ 32.10	$ 38.81	Sierra Vista	$ 258,963	$ 610,458
14.	Falcon Valley Division				Falcon Valley Division		
15.	San Manuel	$ 44.83	$ 48.56	$ 38.81	San Manuel	$ 39,058	$ (196,835)
26.	Oracle	$ 55.12	$ 55.12	$ 38.81	Oracle	$ (9,253)	$ (282,667)
17.	SaddleBrooke	$ 45.75	$ 55.12	$ 38.81	SaddleBrooke	$ (52,320)	$ (86,220)
18.	Winkleman	$ 27.31	$ 36.59	$ 38.81	Winkleman	$ 22,515	$ 33,327
19.							
20.	**Western Group**				**Western Group**		
21.	Pinal Valley System				Pinal Valley System		
22.	Casa Grande / Coolidge	$ 27.61	$ 34.67	$ 38.81	Casa Grande / Coolidge	$ 541,014	$ 4,111,622
23.	Stanfield	$ 36.82	$ 36.82	$ 38.81	Stanfield	$ (46,879)	$ (32,212)
24.	White Tank	$ 36.94	$ 36.94	$ 38.81	White Tank	$ (494,135)	$ (357,774)
25.	Ajo	$ 66.72	$ 60.44	$ 38.81	Ajo	$ -	$ (165,775)
26.							
27.							
28.							
29.							
30.	[1] Monthly Residential bills based on 5/8" X 3/4" meter and 7,500 gallons of usage.						
31.							
32.							
33.							
34.							

JDH-4

Arizona Water Company
Initial Distribution System Improvement Charge Study

Background

In Decision No. 71845, the Arizona Corporation Commission (the "Commission") ordered Arizona Water Company (the "Company") to prepare a study on Distribution System Improvement Charges ("DSIC") designed to implement leak detection devices and make conservation based repairs to infrastructure, and to file a report detailing the findings of this study with the Commission. The Commission stated that an infrastructure funding mechanism may be reasonable for certain of the Company's aging systems, or for systems that face other unique challenges. Further, the Commission stated its intent that the information contained in the study should be used by the Company to further develop this issue for future Commission consideration.

This initial DSIC study addresses costs and rate impacts and takes into consideration how to balance the costs and benefits of such improvements for customers. It is submitted to the Commission to provide the information discussed above, to establish the basis and need for establishing a DSIC mechanism to address aging and failing infrastructure, and urge the Commission to approve such a mechanism in this general rate case.

The Company is a public service corporation which provides public utility water service in portions of Cochise, Coconino, Gila, Maricopa, Navajo, Pima, Pinal and Yavapai Counties in Arizona pursuant to certificates of convenience and necessity granted by the Commission. The Company operates nineteen (19) water systems that serve approximately 84,000 customers.

Historical Development of DSIC

The pressing problem of aging drinking water system infrastructure has been brought to the forefront of public attention by agencies such as the United States Environmental Protection Agency (the "EPA") and organizations such as the American Society of Civil Engineers (the "ASCE"). The ASCE's 2009 *Report Card for American Infrastructure* gave the nation's aging drinking water system infrastructure a grade of D minus.[1] In addition, the EPA, in its report entitled *Drinking Water Infrastructure Needs Survey and Assessment*, projected a twenty year capital improvement funding need of $334.8 billion.[2]

[1] Exhibit A: *2009 Report Card for American Infrastructure – Water And Environment, Drinking Water* produced by American Society of Civil Engineers.
[2] Exhibit B: *Drinking Water Infrastructure Needs Survey and Assessment, Fourth Report to Congress* by the United States Environmental Protection Agency.

As the Commission noted in Decision No. 71845, aging infrastructure is often seen as an East Coast or Midwest phenomenon. But the same EPA report showed that Arizona needs nearly $7.5 billion of water system infrastructure funding over the next twenty years, with nearly half of that funding needed for transmission and distribution system replacements. The EPA report further categorized Arizona's water system infrastructure funding needs as $2.1 billion for medium-sized systems and $889 million for small-sized systems. All of the Company's water systems are classified as medium or small systems based on the EPA water system size categories, as follows:

Large	Systems serving over 100,000 persons
Medium	Systems serving 3,301 to 100,000 persons
Small	Systems serving less than 3,301 persons

In recognition of this growing crisis in the water industry, regulated water utilities began exploring ways to address the replacement and rehabilitation of failing water distribution system infrastructure while balancing financial stability with customer affordability with their state utility commissions. In 1996, Philadelphia Suburban Water Company ("PSWC") petitioned the Pennsylvania Public Utility Commission ("PPUC") seeking approval of a tariff that would establish a DSIC. The PSWC DSIC was designed to recover the fixed costs (depreciation and pre-tax return) of certain non-revenue producing, non-expense reducing infrastructure rehabilitation projects completed and placed in service between rate cases. In its petition to the PPUC, PSWC presented evidence that it was only able to replace/rehabilitate fifteen (15) miles out of a total of 3,130 miles of transmission and distribution ("T & D") mains or less than one-half of a percent each year, based on funding limitations, and at that pace it would take approximately 212 years to complete all of the needed replacements/rehabilitations to its T & D mains. PSWC also pointed out that the DSIC would help it to break out of a cycle of filing for general rate increases every fifteen (15) months, thus reducing the frequency of rate filings, which would benefit customers and the PPUC.

The DSIC proposed by PSWC restricted the type of utility plant eligible for cost recovery under the DSIC, required quarterly filings, set a cap on the maximum amount of revenue that could be collected by the DSIC, established an eligibility earnings test, and finally reset the DSIC to zero when the underlying utility plant was included in base rates in later rate cases.

In approving the DSIC in late 1996, the PPUC noted that: "PSWC and other Pennsylvania water companies had been required to make significant investments in new utility plant for projects such as the filtration of surface water supplies, the replacement of aging water distribution plant and the implementation of meter replacement programs. In addition, water companies face the daunting challenge of rehabilitating their existing distribution infrastructure before the property reaches the end of its service life to avoid serious public health and safety risks".[3]

Following its adoption by the PPUC, public utility commissions in many other jurisdictions including Delaware, California, Connecticut, Indiana, Illinois, Missouri, New York and Ohio adopted DSIC-type mechanisms.[4] In early 1999, the National Association of Regulatory Utility Commissioners ("NARUC") endorsed the mechanism as an example of an innovative regulatory tool that other public utility commissions should consider to solve infrastructure remediation challenges.[5] In 2005 NARUC adopted a resolution identifying the DSIC as a Regulatory Policy Best Practice.[6]

At the 1998 National Association of Water Companies Pennsylvania Forum, Commissioner Norma Brownell of the PPUC reported that implementation of the DSIC created little consumer reaction and resulted in infrastructure investment that otherwise would not have occurred. In a July 2007 Public Meeting PPUC, Chairman Wendell F. Holland further praised the DSIC mechanism as one of the most important regulatory tools of the past decade, and additionally noted the consumer safeguards that were established in conjunction with adoption of the DSIC.[7]

While the DSIC has become an important regulatory tool in other jurisdictions, it has not yet been approved in Arizona. However, in Docket No. W-01303A-05-0405, the Commission adopted a Public Safety Surcharge in Paradise Valley for Arizona American Water Company. This type of surcharge was specifically designed to provide funding for the replacement of undersized and inadequate water mains in the Town of Paradise Valley. While the Public Safety Surcharge collected funds in advance of construction, the DSIC is more like the Arsenic Cost Recovery Mechanism ("ACRM"), which was developed through the collective efforts of the Company, Commission Staff and the Residential Utility Consumers Office ("RUCO"). The ACRM allows utilities that have constructed arsenic treatment plants to seek recovery of capital costs and narrowly defined components of arsenic treatment plant operating costs incurred between formal rate filings. Without this progressive recovery method, a significant number of the State's water utilities would not have had the financial ability to comply with new, more stringent, safe drinking water standards for arsenic.

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[3] Exhibit C: *Petition of Philadelphia Suburban Water Company for Approval to Implement a Tariff Supplement Establishing a Distribution System Improvement Charge; Doc. No. P-00961036, Opinion and Order.*
[4] Exhibit D: *DSIC-type Mechanism by State.*
[5] Exhibit E: *National Association of Regulatory Utility Commissioners ("NARUC") Resolution Endorsing and Co-Sponsoring the Distribution System Improvement Charge, 1999.*
[6] Exhibit F: *National Association of Regulatory Utility Commissioners ("NARUC") Resolution. Supporting Consideration of Regulatory Policies Deemed as "Best Practices", 2005.*
[7] Exhibit G: *Motion of Chairman Wendell F. Holland, Docket No.: P-00062241, et al.*

Assessment of the Company's Distribution Systems

Due to the phenomenal rate of growth seen in the last decade, there is a common misconception that water distribution systems in Arizona are relatively young and that there is no aging infrastructure crisis in this state. In fact, many of the Company's water systems are comprised of a large percentage of aging waterlines and services that are approaching or have already exceeded their useful service lives, and many of those facilities are obsolete or failing. In the Bisbee system, for example, a significant portion of the water mains date back to the 1900s, and nearly thirty percent (30%) of that system's water mains (many of which have a history of chronic leaks) have reached the end of their useful service lives and must be replaced. Even systems viewed as more modern, such as the Company's Pinal Valley water system (Casa Grande, Coolidge and Stanfield), have a significant amount of water mains that were installed from the 1920s through the 1940s.

The materials used in the manufacture of pipe and services plays a significant role in determining the useful service lives of water mains, service lines and other distribution system components. For water mains constructed of ferrous pipe materials, such as cast iron, steel, galvanized steel or ductile iron, corrosion causes pitting of the pipe material. Eventually, the corrosion continues until a hole is formed in the pipe wall leading to a water leak. In advanced stages of corrosion, water mains can fail completely, resulting in a water main break, often causing costly damage to the water facilities, the roadway, and nearby property. In addition, corrosion can lead to the formation of tuberculation, which restricts the flow of water.

Water mains constructed of non-ferrous pipe materials, such as polyvinyl chloride ("PVC") and cement asbestos ("CA"), can become brittle or lose their physical integrity over time through various physical and chemical causes and effects. Even the gasket materials made to seal the joints between pipes fail through degradation of gasket materials. CA pipe, which has been used since the 1930s, loses physical strength through the leaching of cement or binding agents caused by corrosive soil conditions. This loss of physical strength or integrity leads to increased frequencies of water main leaks and breaks.

Water service lines are typically constructed of copper or polyethylene. Other materials have also been used, such as galvanized steel and PVC. Copper service lines can become pitted by internal or external corrosion leading to leaks or breaks. In the 1970s, the use of polyethylene for water service lines became commonplace. These materials become brittle and split longitudinally as they age, making repairs impractical and requiring complete replacement as leaks are discovered. Corrosion of galvanized steel service lines leads to similar signs of failure as seen in galvanized steel water mains, including pitting and tuberculation.

As an example of the factors that contribute to corrosion of water mains, when it first contemplated the use of ductile iron pipe, the Company conducted a number of soil surveys with help from professional engineers working for the Ductile Iron Pipe Research Association ("DIPRA"). Those soil surveys looked for certain soil attributes or conditions that could lead to corrosion. For water mains made from ferrous materials, such as ductile iron pipe, the presence of water, oxygen, conductive soils, sulfate reducing bacteria and nearby cathodic protection systems were found to accelerate or promote corrosion. Field tests were conducted as part of these soil surveys to classify whether the soil would conduct electricity. Since corrosion is essentially an electrochemical process, if the soil is likely to conduct electricity, it is more likely to lead to corrosion. The existence of cathodic protection systems, such as those used to protect steel gas mains against corrosion, can lead to increased rates of corrosion for water distribution systems. The DIPRA study concluded that wrapping ductile iron pipe with a polywrap material would help protect the pipe against corrosion by providing a non-conductive barrier and by providing a barrier against the transfer of oxygen to the pipe.

As a benefit of the DIPRA study, the Company developed specifications for new installations that required the use of polywrap (or encasement of ductile iron pipe with a plastic barrier) in nearly all of its water systems. The plastic barrier limits oxygen transfer to the pipe material, thereby reducing the rates of corrosion. The Company even requires polywrap to be used on copper service lines in certain instances based on its experience with corrosion in some of its water systems. These measures have helped to prolong the life of infrastructure installed since 1986, when ductile iron was first used by the Company in its water systems. When the Company is able to replace aging pre-1986 infrastructure, it will use these materials to maximize the useful life of the new infrastructure.

Additional environmental factors such as vegetation growth can also act to shorten the life of distribution systems. In downtown Coolidge, for example, the Company is replacing more than a mile of CA pipe due in part to the destructive effects of tamarack tree roots that have grown into the couplings of the mains and have caused the couplings to leak or fail. These types of leaks can go undetected for years. CA pipe accounts for forty-six percent (46%) of the water distribution system in the Pinal Valley water system.

An EPA research program titled "Aging Water Infrastructure Research Program" found that the earliest signs of aging pipe are increasing frequencies of water main leaks. Pipe leakage is an inherent aspect of operating a water distribution system, and every water system has measurable system water losses. As pipes age, the frequencies of water main and service line breaks and leaks increase. When reduction of system water losses through leak detection and repairs cannot reasonably keep pace with the increasing rates of leaks or breaks, replacement of water mains becomes necessary.

In Decision No. 71845, the Commission ordered the Company to reduce water loss in all of its systems to less than ten percent (10%) by July 2011. If it is not possible to comply with that standard by that date, the Company is required to submit a report demonstrating how the

Company intends to reduce water losses to less than ten percent (10%). If the Company contends that reducing water losses to less than ten percent (10%) is not cost effective, it must submit a report demonstrating why this reduction is not cost effective. Absent extraordinary circumstances, the Commission requires that no system should be permitted to maintain water losses above fifteen percent (15%).

Mitigating water loss requires an aggressive program of water and service line maintenance and replacement, leak detection, correctly sizing meters and a meter maintenance program. The Company has followed such a program for a number of years. As an example of the Company's efforts to reduce water losses, for the period October 2009 through September 2010, water system operators in the Pinal Valley water system spent nearly 16,000 hours monitoring, detecting and repairing water leaks and breaks. However, even with such an aggressive water loss reduction program, infrastructure does not last forever and eventually fails and needs to be replaced.

As part of its efforts to monitor and identify the sources and remedies for water loss, the Company has conducted a detailed analysis of its Pinal Valley service area and concluded that based upon water main repair logs and the age of the distribution system, approximately 287,000 feet of water main needs to be replaced. Additionally, service line repair records indicate that approximately 3,700 service lines need to be replaced.[8] The preliminary cost estimate for these improvements is nearly $41,000,000 as shown in the table below:

QUANTITY	DESCRIPTION	ESTIMATED COST
14,800	Replace Failing Water Mains 1920 - 1929	$ 736,880
7,116	Replace Failing Water Mains 1930 - 1939	301,470
246,150	Replace Failing Problematic Water Mains 1940 and later	11,205,230
19,304	Replace Failing Large Diameter Water Mains	2,386,230
3,500	Replace Services on Failing Water Mains	7,700,000
3,700	Replace Failing Plastic Services	8,140,000
(1) **SUBTOTAL - MATERIALS AND LABOR**		$ 30,469,810
(2) PERFOMANCE BONDS, SURVEYING, RIGHT OF WAY PERMITTING, TESTING, FIELD INSPECTION AND OVERHEAD		10,524,272
ESTIMATED COST OF CONSTRUCTION		**$ 40,994,082**

[8] The study titled "Water Loss Reduction Program for the Pinal Valley Service Area" is attached to Mr. Schneider's direct testimony as Exhibit FKS-10

To reduce water losses in the Coolidge sub-system, the Company has three water main replacement projects under design and construction. These projects will cost nearly $1.4 million, or an almost thirty-two percent (32%) increase of the rate base approved in Decision No. 71845 for that system.

Economic Discussion

One of the important economic considerations in distribution system improvements is the fact that replacement costs increase dramatically over time. For example, in the Pinal Valley water system, nearly 14,000 feet of cast iron water mains were installed in the period 1921 – 1929. Using the Handy-Whitman engineering cost index (an index that tracks construction costs over time), the index for 1921 for cast iron water mains is 27, while the 2010 index for cast iron water mains is 587. This means that the replacement cost for these water mains in 2010 dollars is 22 times greater than the original installation costs of the water mains installed in 1921. Even though this is a significant increase, the index still fails to fully account for the full increase in construction costs over time. Specifically, it fails to consider that waterline installation in the 1920s was much less complicated than it is today, with the multitude of competing underground infrastructure such as sewer and power lines, fiber optic networks, cable and gas lines which must be accommodated. Another important consideration is that these water mains are in service and that service must be continued during the replacement project, which complicates the process and adds significant additional cost.

As stated above, following a detailed study of its Pinal Valley distribution system, the Company has determined that it needs to replace approximately 287,000 feet of failing water mains and 3,700 services. As noted above, this infrastructure replacement program has an initial cost estimate of $41,000,000. However, identifying the need for capital funding and having access to necessary funding under reasonable terms are two different matters. Based on its current limited financial resources, the Company does not have the ability to fund the type of infrastructure replacement program required to ensure the long-term viability and reliability of the Company's distribution system and ensure reliable and adequate service. Although these types of replacement programs help the Company to provide reliable and adequate water service, they do not generate additional sales or revenue. In other words, these types of replacements add to the Company's cost of providing service, but do not provide any additional revenue to recover those costs. The Company is already in a critical financial condition due to rising operating and maintenance costs and declining water sales and, in fact, is not able to issue additional long-term debt, because it is not able to generate sufficient earnings to meet the minimum interest coverage ratio provision of its General Mortgage Bond Indenture[9].

[9] The Company's General Mortgage Bond Indenture requires that times interest earnings ratio be two (2.0) times the amount of interest on funded debt including the interest on any new bond before any additional long term debt can be issued. Based on its latest financial results the Company's times interest earning ratio is below 2.0, without considering any additional interest.

The infrastructure replacement program needed by the Company to ensure the integrity of its distribution system simply adds to the amount of debt that the Company has and contributes additional costs that will not be recovered in a timely manner. This type of infrastructure replacement program, as much as it may be needed, cannot be undertaken without a change in the way these costs are recovered.

Typically, when a utility is faced with a large capital project, its cost and construction timeline are usually well known in advance. With that knowledge, the utility can time its rate case filing to coincide with completion of the facility to minimize the amount of earnings erosion. But the infrastructure replacement program needed by the Company does not lend itself to that type of timing strategy because it is made up of many smaller projects that will be constructed every year for a number of years. Most of these projects would likely have a very short construction timeline, meaning that they would either not qualify for Allowance for Funds Used During Construction ("AFUDC"), or the amount of AFUDC recorded would be very small. Because these replacement programs do not increase sales or revenues, and since they will not generate AFUDC, they will not generate additional revenues or AFUDC accruals. In order to generate a financial return, the Company would be forced to file for annual rate increases to coincide with these capital expenditures. Even if this were possible, the amount of time and the cost of preparing and presenting an annual rate case would cause further earnings erosion, making this strategy unworkable.

DSIC Details

The Company proposes a DSIC being implemented in Arizona under the following guidelines:

1. The DSIC would recover the fixed costs associated with DSIC-eligible utility plant additions, net of retirements placed in service between rate cases. Utility plant additions eligible for the DSIC would be limited to those additions net of retirements which are properly classified in the following NARUC Uniform System of Accounts for Class A and B Water Utilities (1976):

343	Transmission and Distribution Mains
344	Fire Mains
345	Services
346	Meters
347	Meter Installations
348	Hydrants
398	Miscellaneous Equipment (Leak Detection Equipment)

2. The Company would file DSIC updates with the Commission on a semi-annual basis to reflect eligible utility plant placed in service during the six-month period ending two months prior to each DSIC update as illustrated below:

Effective Date of Update	Period in Which DSIC-Eligible Plant Additions Made
July 1	November 1 – April 30
January 1	May 1 – October 31

3. The Company would file supporting data, as described below, for each semi-annual filing with the Commission at least 30 days prior to the effective date of the update:

Schedule 1: The Company's most recent balance sheet at the time of filing for a DSIC step increase.

Schedule 2: The Company's most recent income statement, including those systems for which the Company requests a DSIC step increase.

Schedule 3: An earnings test schedule for each system where the Company is requesting a DSIC step increase. The earnings test will reflect the Company's most recent financial data.

Schedule 4: A rate review schedule for each system showing the incremental and pro forma effects of the step increase associated with the eligible DSIC capital costs on the financial data provided in Schedules 2 and 3.

Schedule 5: A revenue requirement schedule showing the calculation of the required increase related to eligible DSIC capital costs for each system. The schedule would also indicate the current incremental increase, proposed monthly fixed basic service and volumetric charges for a customer with a 5/8" x 3/4" meter. The required rate of return, gross conversion factor and depreciation rate would be the same rates approved in that system's last rate case.

Schedule 6: A schedule showing the surcharge calculation for eligible DSIC capital costs for each system. Fifty percent (50%) of recoverable capital costs would be in the form of a monthly fixed surcharge, and fifty percent (50%) would be in the form of a volumetric surcharge. The monthly fixed surcharge would be scaled to each meter size based on the approved 5/8" x 3/4" equivalent capacity ratio. This schedule would also provide information related to the number of customers by meter size and the number of gallons sold.

Schedule 7: A rate base schedule for each system showing the rate base determined in the most recent rate case, as well as the most recent rate base calculated as of the date of the information provided in Schedules 1 and 2, both adjusted to reflect the inclusion of completed and in-service eligible DSIC facilities.

Schedule 8: A Construction Work In Progress ledger showing monthly charges related to the construction of eligible DSIC facilities.

Schedule 9: A schedule showing the calculation of the Company's general plant allocation methodology.

Schedule 10: A typical bill analysis comparing bills for customers with a 5/8" x 3/4" meter under present and proposed rates.

4. The DSIC surcharge would be shown as a separate line item on each customer's bill. At least twice per year, the Company would be required to print a message on each customer's bill explaining the DSIC surcharge and indicating the progress being made on replacing aging infrastructure.

5. The DSIC would be phased-in over time and capped at seven and one-half percent (7.5%) of the annual amount billed to customers under otherwise applicable rates and charges.

6. The DSIC would be reset to zero, as of the effective date of each new general rate case, by inclusion of the DSIC-eligible plant in rate base used to set base rates in the general rate case. Thereafter, new DSIC-eligible utility plant additions not included in the general rate case would form the basis for the new semi-annual DSIC filings. No DSIC filing would be made if, in any semi-annual period, the system for which the filing is made is earning a rate of return that exceeds the rate of return that would be used to calculate the revenue requirement under the DSIC.

Customer Benefits

Customer benefits associated with a DSIC include improved water quality, fire protection and public safety, increased water pressure, decreased water loss, reduced main breaks, and fewer service interruptions. Additionally, implementation of a DSIC would help lead to rate stability, improve affordability and avoid large or sudden rate increases.

Failing distribution infrastructure often results in a number of customer service issues ranging from service interruptions for a single customer to larger problems involving service outages for hundreds of customers. Additionally, leaking water mains and services result in millions of gallons of treated water lost every year. While the Company's leak detection and repair program has made progress in reducing the amount of water lost to leaks and breaks, the distribution system replacement plan and the DSIC mechanism proposed here by the Company are practical ways to make real progress towards updating and improving integrity and reliability of the distribution system, as well as reducing customer outages caused by distribution system failures.

Implementation of a DSIC would help to provide the Company with the necessary financial means to invest in replacing its aging infrastructure, and would allow it to make these investments in orderly, scheduled incremental steps. Additionally, implementing a DSIC would mitigate the rate impact on customers by providing small, regular rate increases, rather than large irregular increases that make customer affordability and acceptance more difficult.

Based on $2.5 million of infrastructure to be replaced, the impact on a typical residential customer's monthly bill in the Pinal Valley water system would be $0.99.[10] Even at the maximum capped amount of seven and one-half percent (7.5%), the average monthly residential bill would not increase by more than $2.89. In a recent ITT Value of Water Survey, nearly one in four American voters is "very concerned" about the state of the nation's water infrastructure, and when asked, two-thirds responded that they were willing to pay an average of $6.20 more per month to upgrade water infrastructure.[11] While each customer has a different view of how much they would be willing to pay to replace infrastructure, it is interesting to note that in this survey and the comments expressed by PPUC Commissioner Brownell, customers appear to support increased water rates for necessary infrastructure replacement.

<u>Conclusion</u>

Distribution systems have a limited life and must eventually be replaced. The replacement of aging infrastructure, however, requires the replacement of all utility plant, whether funded initially by contributions, refundable advances, or utility investments. This single issue is a primary focus of discussions at the NARUC, the American Water Works Association, the ASCE, the EPA and other organizations. The scope of this issue is so large, in fact, that the capital investments identified by the EPA in recent national surveys show that hundreds of billions of dollars are needed to replace aging water system infrastructure in this country.

In a detailed study focusing on the Pinal Valley service area, the Company identified $41,000,000 million in critically needed waterline and service replacements. These replacements are needed to improve service reliability, increase pressure, decrease water losses and to enhance fire protection and public safety. The current rate structure will not allow for these critically-needed investments. The Company is unable to issue additional long-term debt due to its inability to meet the interest coverage ratio requirement in its General Mortgage Bond Indenture. The Company's ability to issue even short-term debt has been questioned by Commission Staff,

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[10] Exhibit H: *DSIC Revenue Requirement*
[11] Exhibit I: *ITT Corporation Value of Water Survey, Americans on the U.S. Water Crisis, 2010*

which raised concerns about the Company's continued ability to refinance its line of credit. Battered in recent years by steep increases in debt and expenses, the Company has been unable to recover its cost of service for a number of years. In this type of financial environment, prudent management would lead the Company to slash capital spending to the minimum, not to increase its capital spending. Yet, it is in this environment that the Company faces an order from the Commission to reduce its water losses, which requires replacement of aging water distribution infrastructure. Analyses conducted by the Company's engineering staff indicate that significant water line and service replacements are immediately necessary for a number of its systems and, ultimately, for all of its systems to ensure the integrity of the distribution system.

Even if it were possible for the Company to fund these improvements under traditional rate making, the resulting steep increases in customer rates could create a hardship for customers. A better way to achieve these goals is the adoption of the DSIC as outlined in this study. This would result in gradual increases in customers' bills without the impacts resulting from traditional ratemaking, while providing the Company a way to recover its cost of these investments. Therefore, the Company urges the Commission to carefully consider the information presented in this study to develop a DSIC procedure as a ratemaking tool to address the urgent need for water distribution system replacements.

JDH-5

Exhibit 2.1: State 20-Year Need Reported by Project Type (in millions of January 2007 dollars)

State	Transmission/ Distribution	Source	Treatment	Storage	Other	Total
Alabama	$3,343.9	$71.6	$386.5	$285.3	$12.0	$4,099.4
Alaska	$478.2	$56.4	$121.3	$150.0	$6.5	$812.4
Arizona	$3,819.0	$460.3	$2,150.2	$900.1	$81.1	$7,410.7
Arkansas	$3,667.5	$149.3	$966.0	$478.3	$17.4	$5,278.5
California	$22,988.5	$2,515.3	$7,549.7	$5,735.6	$257.3	$39,046.3
Colorado	$3,156.7	$371.7	$2,150.2	$696.7	$24.8	$6,400.1
Connecticut	$807.1	$134.9	$280.6	$151.6	$19.7	$1,394.0
District of Columbia	$836.8	$0.0	$0.4	$35.5	$1.5	$874.2
Florida	$7,234.9	$887.3	$3,552.1	$975.4	$173.5	$12,823.1
Georgia	$6,295.6	$406.2	$1,390.5	$751.5	$93.9	$8,937.7
Illinois	$8,982.0	$1,576.3	$2,907.8	$1,386.7	$164.2	$15,017.1
Indiana	$3,814.2	$353.8	$1,096.1	$648.5	$31.8	$5,944.4
Iowa	$4,356.8	$271.9	$990.8	$467.2	$26.4	$6,113.1
Kansas	$2,784.4	$187.1	$684.1	$339.7	$35.0	$4,030.2
Kentucky	$3,643.6	$121.7	$699.0	$474.8	$38.9	$4,978.1
Louisiana	$5,100.7	$305.7	$1,024.8	$427.4	$41.3	$6,900.1
Maryland	$3,497.6	$180.6	$1,134.5	$606.0	$24.7	$5,443.4
Massachusetts	$4,456.4	$340.9	$1,130.1	$823.4	$39.1	$6,790.0
Michigan	$7,657.6	$529.6	$2,548.5	$1,035.8	$71.3	$11,842.8
Minnesota	$2,819.3	$372.0	$1,982.9	$770.3	$43.9	$5,988.4
Mississippi	$1,604.4	$284.7	$907.2	$429.8	$17.2	$3,243.3
Missouri	$4,801.8	$324.7	$1,281.2	$635.7	$42.3	$7,085.6
Nebraska	$1,017.7	$140.5	$309.2	$300.8	$8.4	$1,776.6
Nevada	$1,116.4	$892.3	$202.2	$460.6	$19.8	$2,691.3
New Jersey	$4,722.9	$307.1	$1,850.4	$1,056.7	$24.7	$7,961.6
New York	$15,417.0	$1,915.5	$6,986.2	$2,707.8	$110.9	$27,137.3
North Carolina	$6,037.1	$670.7	$2,237.7	$1,032.7	$77.1	$10,055.2
Ohio	$8,374.2	$564.2	$2,235.6	$1,330.4	$94.6	$12,599.0
Oklahoma	$2,603.5	$142.0	$858.9	$493.5	$14.1	$4,112.1
Oregon	$1,520.6	$156.3	$546.1	$536.0	$26.2	$2,785.3
Pennsylvania	$7,644.9	$557.1	$1,834.5	$1,284.2	$58.7	$11,379.3
Puerto Rico	$1,079.5	$80.6	$1,037.4	$325.2	$14.8	$2,537.5
South Carolina	$1,102.7	$75.2	$222.3	$210.2	$17.9	$1,628.3
Tennessee	$2,356.3	$109.2	$692.8	$368.0	$21.2	$3,547.6
Texas	$15,950.2	$1,600.3	$5,785.2	$2,695.8	$99.2	$26,130.8
Virginia	$3,806.3	$196.0	$1,293.3	$722.8	$43.6	$6,061.9
Washington	$5,765.5	$717.3	$1,580.0	$1,502.7	$190.6	$9,756.0
Wisconsin	$3,550.5	$385.1	$1,467.5	$758.7	$24.2	$6,186.0
Partially Surveyed States*	$10,478.1	$1,131.1	$3,347.3	$2,099.5	$136.3	$17,192.4
Subtotal	**$198,690.3**	**$19,542.3**	**$67,421.3**	**$36,091.3**	**$2,246.3**	**$323,991.4**
American Samoa	$43.7	$10.6	$15.9	$22.0	$0.6	$92.8
Guam	$223.6	$2.0	$8.6	$29.7	$0.0	$263.9
Commonwealth of the Northern Mariana Islands	$123.2	$28.7	$61.8	$65.8	$9.7	$289.3
U.S. Virgin Islands	$138.3	$7.1	$45.9	$59.8	$2.3	$253.3
Subtotal	***$528.8***	***$48.4***	***$132.2***	***$177.2***	***$12.7***	***$899.4***
Total State Need	**$199,219.1**	**$19,590.7**	**$67,553.5**	**$36,268.5**	**$2,259.0**	**$324,890.8**

* For the 2007 DWINSA the need for states that opt out of the medium system portion of the survey is presented cumulatively and not by state. The list of the 14 partially surveyed states can be seen in Exhibit 2.4.

Exhibit 2.2: State 20-Year Need Reported by System Size (in millions of January 2007 dollars)

State	Large	Medium	Small	NPNCWS	Total
Alabama	$998.5	$2,709.8	$387.2	$3.8	$4,099.4
Alaska	$85.1	$302.3	$363.8	$61.1	$812.4
Arizona	$4,381.4	$2,121.3	$889.4	$18.5	$7,410.7
Arkansas	$443.6	$3,854.3	$973.3	$7.3	$5,278.5
California	$21,345.9	$14,098.1	$3,500.9	$101.4	$39,046.3
Colorado	$2,079.0	$3,246.6	$1,073.2	$1.3	$6,400.1
Connecticut	$288.3	$451.2	$627.0	$27.5	$1,394.0
District of Columbia	$874.2	$0.0	$0.0	$0.0	$874.2
Florida	$5,135.7	$5,769.3	$1,790.4	$127.7	$12,823.1
Georgia	$2,663.4	$4,716.0	$1,544.5	$13.8	$8,937.7
Illinois	$5,248.1	$7,006.7	$2,652.2	$110.2	$15,017.1
Indiana	$1,417.2	$3,291.0	$1,059.9	$176.3	$5,944.4
Iowa	$458.2	$4,190.3	$1,446.2	$18.4	$6,113.1
Kansas	$766.5	$2,017.8	$1,242.3	$3.5	$4,030.2
Kentucky	$757.5	$3,879.0	$340.5	$1.1	$4,978.1
Louisiana	$3,354.7	$2,249.4	$1,281.0	$14.9	$6,900.1
Maryland	$3,924.1	$853.3	$567.8	$98.2	$5,443.4
Massachusetts	$1,683.3	$4,649.7	$424.0	$32.9	$6,790.0
Michigan	$4,952.6	$4,677.0	$1,740.9	$472.2	$11,842.8
Minnesota	$672.0	$3,631.7	$1,416.5	$268.3	$5,988.4
Mississippi	$227.0	$1,432.2	$1,574.5	$9.6	$3,243.3
Missouri	$1,342.2	$3,860.3	$1,844.0	$39.1	$7,085.6
Nebraska	$379.0	$632.2	$749.4	$16.0	$1,776.6
Nevada	$2,098.2	$291.2	$287.7	$14.2	$2,691.3
New Jersey	$3,636.5	$3,502.2	$619.4	$203.6	$7,961.6
New York	$17,956.6	$5,434.9	$3,619.7	$126.2	$27,137.3
North Carolina	$3,043.9	$4,907.5	$1,734.1	$369.7	$10,055.2
Ohio	$3,172.1	$7,449.7	$1,695.0	$282.2	$12,599.0
Oklahoma	$714.8	$1,917.2	$1,457.9	$22.3	$4,112.1
Oregon	$674.2	$958.2	$1,097.3	$55.6	$2,785.3
Pennsylvania	$3,950.8	$4,542.2	$2,604.6	$281.8	$11,379.3
Puerto Rico	$823.6	$1,109.4	$603.3	$1.2	$2,537.5
South Carolina	$295.4	$806.1	$510.6	$16.2	$1,628.3
Tennessee	$555.8	$2,224.9	$738.1	$28.8	$3,547.6
Texas	$7,614.8	$13,376.3	$5,091.9	$47.7	$26,130.8
Virginia	$2,474.4	$2,216.5	$1,279.4	$91.7	$6,061.9
Washington	$2,686.7	$4,586.7	$2,366.6	$116.1	$9,756.0
Wisconsin	$1,299.2	$3,074.9	$1,328.4	$483.5	$6,186.0
Partially Surveyed States*	$1,664.1	$8,537.0	$6,686.7	$304.5	$17,192.4
Subtotal	***$116,139.0***	***$144,574.7***	***$59,209.6***	***$4,068.2***	***$323,991.4***
American Samoa	$0.0	$59.5	$33.3	$0.0	$92.8
Guam	$203.1	$60.8	$0.0	$0.0	$263.9
Commonwealth of the Northern Mariana Islands	$0.0	$158.6	$130.6	$0.0	$289.3
U.S. Virgin Islands	$0.0	$197.4	$55.9	$0.0	$253.3
Subtotal	***$203.1***	***$476.4***	***$219.9***	***$0.0***	***$899.4***
Total State Need	**$116,342.1**	**$145,051.1**	**$59,429.5**	**$4,068.2**	**$324,890.8**

* For the 2007 DWINSA the need for states that opt out of the medium system portion of the survey is presented cumulatively and not by state. The list of the 14 partially surveyed states can be seen in Exhibit 2.4.

JDH-6

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Balance Sheet
As of December 31, 2009

Line No.		[A] TOTAL COMPANY	[B] WESTERN GROUP[1]	[C] PINAL VALLEY
1	ASSETS			
2				
3	UTILITY PLANT			
4	Gross Utility Plant	$ 389,742,363		
5	Less: Accumulated Depreciation	86,303,450		
6	Net Utility Plant	$ 303,438,913		
7				
8	CURRENT ASSETS			
9	Cash on Hand and in Banks	1,612,976		
10	Investments and Special Deposits	2,703		
11	Accounts Receivable	3,142,008		
12	Materials & Supplies	277,830		
13	Other	414,410		
14	Total Current Assets	$ 5,449,927		
15				
16	DEFERRED DEBITS	$ 6,157,090		
17				
18	TOTAL ASSETS	$ 315,045,930		
19				
20				
21	LIABILITIES			
22				
23	CAPITALIZATION			
24	Common Stock	2,700,000		
25	Capital Surplus	9,087,347		
26	Retained Earnings	56,497,908		
27	Common Stockholders Equity	$ 68,285,255	$ 24,965,089	$ 18,464,333
28	*Long-Term Debt*	75,000,000	27,420,000	20,280,000
29	Total Capitalization	$ 143,285,255	$ 52,385,089	$ 38,744,333
30				
31	CURRENT LIABILITIES			
32	Notes Payable	6,000,000		
33	Accounts Payable	5,117,514		
34	Accrued Expenses	2,094,884		
35	Other	-		
36	Total Current Liabilities	$ 13,212,398		
37				
38	DEFERRED CREDITS			
39	Advances for Construction	82,666,061		
40	Contributions in Aid of Construction	47,509,171		
41	Deferred Income Taxes	23,622,910		
42	Other	4,750,135		
43	Total Deferred Credits	$ 158,548,277		
44				
45	TOTAL CAPITAL AND LIABILITIES	$ 315,045,930		
46				
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54				
55	[1]Allocated based on percentage of rate base to total company rate base.			

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Income Statement
12 Months Ending December 2009

Line No.		[A] TOTAL COMPANY	[B] WESTERN GROUP	[C] PINAL VALLEY
1				
2	OPERATING REVENUE	$ 51,429,832	$ 18,693,247	$ 16,574,910
3				
4	OPERATING EXPENSES			
5	Operation and Maintenance	26,569,681	10,113,600	9,033,956
6	Depreciation	8,473,317	3,580,346	3,120,561
7	Taxes Other than Income	6,668,744	2,583,464	2,380,893
8	Income Taxes	2,060,289	512,170	432,385
9	Total Operating Expenses	$ 43,772,031	$ 16,789,580	$ 14,967,795
10				
11	OPERATING INCOME	$ 7,657,801	$ 1,903,667	$ 1,607,115
12				
13	OTHER (INCOME) AND DEDUCTIONS			
14	Other (Income) - Net	(223,759)	(86,304)	(77,727)
15				
16	Interest on Long-Term Debt	5,115,500	1,973,048	1,776,966
17	Other Interest and Amortization	(135,105)	(52,110)	(46,931)
18	Total Interest	$ 4,980,395	$ 1,920,938	$ 1,730,034
19				
20	Total Other (Income) and Deductions	$ 4,756,636	$ 1,834,634	$ 1,652,307
21				
22	NET INCOME	$ 2,901,165	$ 69,033	$ (45,192)
23				
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ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Earnings Test
12 Months Ending December 2009

Line No.		[A] PINAL VALLEY
1		
2	REVENUE	
3	Total Operating Revenue	$ 16,574,910
4		
5	OPERATING EXPENSES	
6	Operation and Maintenance	9,033,956
7	Depreciation	3,120,561
8	Taxes Other than Income	2,380,893
9	Income Taxes	432,385
10	Total Operating Expenses	$ 14,967,795
11		
12	OPERATING INCOME/(LOSS)	$ 1,607,115
13		
14	RATE BASE - O.C.L.D. (Includes DSIC Plant)	42,603,042
15	(Sch. 7, Ln. 33)	
16		
17	RATE OF RETURN - O.C.L.D	3.77%
18	(Ln. 12 / Ln. 14)	
19		
20	AUTHORIZED RATE OF RETURN	7.87%
21	(Decision No. 71845)	
22		
23	OPERATING MARGIN	9.70%
24	(Ln. 12 / Ln. 3)	
25		
26	Interest Expense - Net	$ 1,730,034
27		
28	INEREST COVERAGE	1.18
29	[(Ln. 12 + Ln. 9) / Ln. 26]	
30		
31	Other (Income) and Deductions	$ (77,727)
32		
33	Equity Ratio	45.9%
34	(Decision 71845)	
35		
36	Allocated Equity	$ 19,533,495
37	(Ln. 14 x Ln. 33)	
38		
39	RETURN ON EQUITY	-0.23%
40	[(Ln. 12 - Ln. 26 - Ln. 31) / Ln. 36]	
41		
42	AUTHORIZED RETURN ON EQUITY	9.50%
43	(Decision No. 71845)	
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ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Rate Review
12 Months Ending December 2009

Exhibit JDH-6
Schedule 4

Witness: Harris

Line No.		[A] PINAL VALLEY Per Dec. No. 71845	[B] PINAL VALLEY 12 Mos. Ending 12/31/2009	[C] PINAL VALLEY DSIC Increase	[D] PINAL VALLEY Adjusted with DSIC
1					
2	REVENUE				
3	Total Operating Revenue	$ 17,114,071	$ 16,574,910	$ 439,281	$ 17,014,191
4					
5	OPERATING EXPENSES				
6	Operation and Maintenance	8,627,086	9,033,956	-	9,033,956
7	Depreciation	2,762,625	3,120,561	45,248	3,165,809
8	Taxes Other than Income	960,877	2,380,893	-	2,380,893
9	Income Taxes	1,229,441	432,385	156,033	588,418
10	Total Operating Expenses	$ 13,580,029	$ 14,967,795	$ 201,281	$ 15,169,076
11					
12	OPERATING INCOME/(LOSS)	$ 3,534,042	$ 1,607,115	$ 238,000	$ 1,845,115
13					
14	RATE BASE - O.C.L.D.	44,904,721	40,103,042	2,500,000	42,603,042
15	(Sch. 7, Ln. 33)				
16					
17	RATE OF RETURN - O.C.L.D	7.87%	4.01%	9.52%	4.33%
18	(Ln. 12 / Ln. 14)				
19					
20	AUTHORIZED RATE OF RETURN	9.50%	9.50%	9.50%	9.50%
21	(Decision No. 71845)				
22					
23	OPERATING MARGIN	20.65%	9.70%	54.18%	10.84%
24	(Ln. 12 / Ln. 3)				
25					
26	Interest Expense - Net	$ 1,578,311	$ 1,730,034	87,750	1,817,784
27					
28	INEREST COVERAGE	3.02	1.18	4.49	1.34
29	[(Ln. 12 + Ln. 9) / Ln. 26]				
30					
31					
32					
33	Equity Ratio	45.9%	45.9%	45.9%	45.9%
34	(Decision 71845)				
35					
36	Allocated Equity	$ 20,588,815	$ 18,387,245	$ 1,146,250	$ 19,533,495
37	(Ln. 14 x Ln. 33)				
38					
39	RETURN ON EQUITY	9.50%	-0.67%	13.10%	0.14%
40	[(Ln. 12 - Ln. 26) / Ln. 36]				
41					
42	AUTHORIZED RETURN ON EQUITY	9.50%	9.50%	9.50%	9.50%
43	(Decision No. 71845)				
44					
45	THREE FACTOR RATIO	0.3209	0.3474	0.3474	0.3474
46					
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Supporting Schedules:

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Recap Schedules:

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Revenue Requirement
As of December 31, 2009

Exhibit JDH-6
Schedule 5

Witness: Harris

Line No.		[A] PINAL VALLEY	[B]	[C]	[D]
1	TEST YEAR DATA				
2					
3	Eligible DSIC Plant in Service	$ 2,500,000			
4	Accumulated *Depreciation*	-			
5	(Sch. 8, p. 1)				
6	Eligible DSIC Plant Rate Base	$ 2,500,000			
7	Required Rate of Return	9.52%			
8					
9	Required Operating Income	$ 238,000			
10	(Ln. 6 x Ln. 7)				
11	Revenue Conversion Factor	1.6556			
12					
13	Revenue Requirement - Return on Eligible DSIC Plant	$ 394,033			
14	(Ln. 9 x Ln. 11)				
15					
16	Depreciation on Eligible DSIC Plant	$ 45,248			
17	(Sch. 8, p. 1)				
18					
19	Total Revenue Requirement	$ 439,281			
20	(Ln. 13 + Ln. 16)				
21					
22					
23			PINAL VALLEY (CASA GRANDE/COOLIDGE)		
24			Current		
25			Rates	Proposed Rates	
26					
27			Decision No.		Total
28			71845	DSIC	[B + C]
29	5/8 X 3/4-INCH RESIDENTIAL METER				
30	Basic Service Charge		$ 15.79	$ 0.61	$ 16.40
31	Commodity Rate (Per M Gallon)				
32	0 - 3,000 Gallons		$ 1.3700	$ 0.0427	1.4127
33	3,001 - 10,000 Gallons		$ 1.7123	$ 0.0427	1.7550
34	Over 10,000 Gallons		$ 2.1406	$ 0.0427	2.1833
35					
36					
37			PINAL VALLEY (STANFIELD)		
38			Current		
39			Rates	Proposed Rates	
40					
41			Decision No.		Total
42			71845	DSIC	[B + C]
43	5/8 X 3/4-INCH RESIDENTIAL METER				
44	Basic Service Charge		$ 15.79	$ 0.61	$ 16.40
45	Commodity Rate (Per M Gallon)				
46	0 - 3,000 Gallons		$ 2.4379	$ 0.0427	2.4806
47	3,001 - 10,000 Gallons		$ 3.0476	$ 0.0427	3.0903
48	Over 10,000 Gallons		$ 3.8097	$ 0.0427	3.8524
49					
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53					
54					
55					

Supporting Schedules:

Recap Schedules:

PINAL VALLEY

Line No.		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]
2				M Gallons	M Gallons					
3	GROWTH		Customers	Sold	Sold Per Cust.					
4	12/31/2008 (Year 1)		27,842	5,151,137.0	185.0					
5	12/31/2009 (Year 2)		27,973	5,134,786.7	183.6					
6	Increase/(Decrease)		131	(16,350)	(1.5)					
7	Percentage Change		0.47%	-0.32%	-0.78%					
8	Average M Gallons			5,142,961.9						
11	INCREMENTAL FIXED COSTS TO BE RECOVERED PER BILL									
13				Est. Average				Equivalent	Fixed Increment	
14		Custeomers by Meter Size		Customers		Basic Service	Meter	Meters	Monthly	Annual
15	Size	12/31/2009	12/31/2010	(A + B) / 2		Charge	Multiples	(C X F)	(G39 X F)	(C X G) X 12
17	5/8"	27,322	27,451	27,387		**varies**	1.0	27,387	$ 0.61	$ 199,803
18	1"	543	546	545		**varies**	2.5	1,361	1.52	9,932
19	1.5"	-	-	-		**varies**	n/a	-	-	-
20	2"	88	88	88		**varies**	8.0	703	4.86	5,131
21	3"	8	8	8		**varies**	16.0	125	9.73	915
22	4"	3	3	3		**varies**	25.0	80	15.20	582
23	6"	9	9	9		**varies**	50.0	449	30.40	3,277
24	8"	-	-	-		**varies**	80.0	-	48.64	-
25	10"	-	-	-		**varies**	115.0	-	69.92	-
26	Totals	27,973	28,105	28,039				30,106		$ 219,641

Line No.	CALCULATION OF SURCHARGE		Minimum Surcharge (F34 X .5)	Commodity Surcharge (F34 X .5)
34	Total Revenue Requirement of DSIC Eligible Plant Capital Costs	$ 439,281		
35	50% of Total Revenue Requirement on Line 34 Recoverable through Basic Service Charge		$ 219,641	
36	50% of Total Revenue Requirement on Line 34 Recoverable through Commodity Charge			$ 219,641
38	Equivalent Meters (Col. G, Ln. 26 X 12 Mos.)		361,267	
39	Increment Per Equivalent 5/8" Meter (Col. G, Ln. 35 / Col. G, Ln. 38)		$ 0.61	
41	Average M Gallons (Col. C, Ln. 8)			5,142,961.9
42	Increment Per M Gallon (Col. H, Ln. 36 / Col. H, Ln. 41)			$ 0.0427

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Rate Base
As of December 31, 2009

Exhibit JDH-6
Schedule 7

Witness: Harris

Line No.		[A] PINAL VALLEY Per Dec. No. 71845	[B] PINAL VALLEY DSIC Plant Increase	[C] PINAL VALLEY Dec. Plus DSIC Plant (A + B)	[D] PINAL VALLEY Actual Balance 12/31/2009	[E] PINAL VALLEY DSIC Plant Increase	[F] PINAL VALLEY Actual Plus DSIC Increase (D + E)
1							
2	DSIC Eligible Plant	$ -	$ 2,500,000	$ 2,500,000	$ -	$ 2,500,000	$ 2,500,000
3							
4	Other Utility Plant in Service	120,143,397	-	120,143,397	120,285,654	-	120,285,654
5	Total Plant in Service	$ 120,143,397	$ 2,500,000	$ 122,643,397	$ 120,285,654	$ 2,500,000	$ 122,785,654
6	(Ln. 2 + Ln. 4)						
7							
8	Accumulated Depreciation	20,198,728.0	-	20,198,728	21,769,965	-	21,769,965
9	Net Utility Plant	$ 99,944,669	$ 2,500,000	$ 102,444,669	$ 98,515,689	$ 2,500,000	$ 101,015,689
10	(Ln. 5 - Ln. 8)						
11							
12	Advances	36,902,330	-	36,902,330	39,846,625	-	39,846,625
13							
14	Contributions - Net	12,403,783	-	12,403,783	13,885,445	-	13,885,445
15							
16	Deferred Income Tax	6,150,049	-	6,150,049	6,387,635	-	6,387,635
17							
18	Customer Deposits	324,478					
19							
20	Working Capital Allowance	179,178	-	179,178	179,178	-	179,178
21	(Per Dec. 71845)						
22							
23	Net Regulatory Asset/(Liability)	561,514					
24							
25	Subtotal Rate Base	$ 44,904,721	$ 2,500,000	$ 47,167,685	$ 38,575,162	$ 2,500,000	$ 41,075,162
26	(Ln. 9 - Ln. 12 - Ln. 14 - Ln. 16 + Ln. 18)						
27							
28	Phoenix Office Allocation	- [1]	-	-	1,527,880 [2]	-	1,527,880
29							
30	Meter Shop Allocation	- [1]	-	-	-	-	-
31							
32	Total Rate Base	44,904,721	2,500,000	47,167,685	40,103,042	2,500,000	42,603,042
33	(Ln. 21 + Ln. 24 + Ln. 26)						

54 [1]Phoenix Office and Meter Shop allocation included in line 4.
55 [2]Includes Meter Shop allocation.

Supporting Schedules:

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Recap Schedules:

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
CWIP Ledger
As of December 31, 2009

Exhibit JDH-6
Schedule 8

Witness: Harris

Line No.	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[I]
1					PINAL VALLEY					
2	W.A. No.	Month/Year	Date	Description	Vendor Name	Invoice No.	34301	34501	34801	Total
3										
4	1-5000	May-08	5/30/2008	JV-1 PAYROLL						
5			5/30/2008	JV-2 PAYROLL TAXES			1,341.00	45.00	114.00	1,500.00
6			5/30/2008	JV-9 TRANSPORTATION			107.00	4.00	9.00	120.00
7							268.00	9.00	23.00	300.00
8							$ 1,716.00	$ 58.00	$ 146.00	$ 1,920.00
13										
14		Jun-08	6/30/2008	JV-1 PAYROLL						
15			6/30/2008	JV-2 PAYROLL TAXES			7,154.00	240.00	607.00	8,001.00
16			6/30/2008	JV-9 TRANSPORTATION			501.00	17.00	42.00	560.00
17			6/30/2008	Payables Trx Entry			1,431.00	48.00	121.00	1,600.00
18					ABC CONTRACTING	0100004	2,235,000.00	75,000.00	177,919.00	2,487,919.00
19							$ 2,244,086.00	$ 75,305.00	$ 178,689.00	$ 2,498,080.00
20										
21						Project Totals	$ 2,245,802.00	$ 75,363.00	$ 178,835.00	$ 2,500,000.00
22										
23						Depreciation Rate	1.79%	2.38%	1.82%	
24										
25						Annual Depreciation Expense	$ 40,200	$ 1,794	$ 3,255	$ 45,248
26										
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Supporting Schedules:

Recap Schedules:

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Three Factor Calculation
Fiscal Year 2009

Exhibit JDH-6
Schedule 9

Witness: Harris

Line No.	System	2008 Customers	2008 Gross Plant Less Intangibles	2008 Gross Payroll	Ratios Customers	Ratios Gross Plant Less Intangibles	Ratios Gross Payroll	Total	Three Factor Ratio
1									
2	Superstition	23,868	$ 107,806,887	$ 2,358,834	0.2851	0.2923	0.2791	0.8566	0.2855
3	Cochise	6,375	18,600,630	678,044	0.0761	0.0504	0.0802	0.2068	0.0689
4	San Manuel	1,516	4,189,431	174,513	0.0181	0.0114	0.0207	0.0501	0.0167
5	Oracle	1,525	8,225,478	175,550	0.0182	0.0223	0.0208	0.0613	0.0204
6	Winkelman	164	572,048	18,879	0.0020	0.0016	0.0022	0.0057	0.0019
7	Saddlebrooke	37	1,059,840	4,259	0.0004	0.0029	0.0005	0.0038	0.0013
8	Pinal Valley	27,842	136,434,861	2,869,730	0.3326	0.3700	0.3396	1.0421	0.3474
9	White Tank	1,884	17,284,928	189,932	0.0225	0.0469	0.0225	0.0918	0.0306
10	Ajo	677	2,243,869	68,251	0.0081	0.0061	0.0081	0.0222	0.0074
11	Navajo	9,239	28,715,966	782,813	0.1104	0.0779	0.0926	0.2809	0.0936
12	Verde Valley	10,593	43,655,065	1,129,717	0.1265	0.1184	0.1337	0.3786	0.1262
13					-	-	-	-	-
14					-	-	-	-	-
15					-	-	-	-	-
16					-	-	-	-	-
17					-	-	-	-	-
18					-	-	-	-	-
19					-	-	-	-	-
20					-	-	-	-	-
21	Totals	83,720	$ 368,789,003	$ 8,450,522	1.0000	1.0000	1.0000	3.0000	1.0000
22									
23									
24									
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Supporting Schedules:

Recap Schedules:

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Typical Bill Analysis
As of December 2009

Exhibit JDH-6
Schedule 10

Witness: Harris

Line No.	Gallons Consumption	[A] PINAL VALLEY (CASA GRANDE/COOLIDGE) Present Rates	[B] Proposed Rates	[C] DSIC Increase	[D] Percent Increase	[E] PINAL VALLEY (STANFIELD) Present Rates	[F] Proposed Rates	[G] DSIC Increase	[H] Percent Increase
1									
2	-	$ 15.79	$ 16.40	$ 0.61	3.9%	$ 15.79	$ 16.40	$ 0.61	3.9%
3	1,000	17.16	17.81	0.65	3.8%	18.23	18.88	0.65	3.6%
4	2,000	18.53	19.22	0.69	3.7%	20.67	21.36	0.69	3.4%
5	3,000	19.90	20.64	0.74	3.7%	23.10	23.84	0.74	3.2%
6	4,000	21.61	22.39	0.78	3.6%	26.15	26.93	0.78	3.0%
7	5,000	23.32	24.15	0.82	3.5%	29.20	30.02	0.82	2.8%
8	6,000	25.04	25.90	0.86	3.5%	32.25	33.11	0.86	2.7%
9	7,000	26.75	27.66	0.91	3.4%	35.29	36.20	0.91	2.6%
10	8,000	28.46	29.41	0.95	3.3%	38.34	39.29	0.95	2.5%
11	9,000	30.17	31.17	0.99	3.3%	41.39	42.38	0.99	2.4%
12	10,000	31.89	32.92	1.04	3.2%	44.44	45.47	1.04	2.3%
13	11,000	34.03	35.10	1.08	3.2%	48.25	49.32	1.08	2.2%
14	12,000	36.17	37.29	1.12	3.1%	52.06	53.18	1.12	2.2%
15	13,000	38.31	39.47	1.16	3.0%	55.87	57.03	1.16	2.1%
16	14,000	40.45	41.65	1.21	3.0%	59.68	60.88	1.21	2.0%
17	15,000	42.59	43.84	1.25	2.9%	63.49	64.73	1.25	2.0%
18	20,000	53.29	54.75	1.46	2.7%	82.53	84.00	1.46	1.8%
19	25,000	64.00	65.67	1.68	2.6%	101.58	103.26	1.68	1.6%
20									
21									
22	Average Residential Consumption	9,062	9,062			9,122	9,122		
23									
24	Residential Bill at Average Consumption	$ 30.28	$ 31.27	$ 0.99	3.3%	$ 41.58	$ 42.57	$ 0.99	2.4%
25									
26									
27									
28									
29									
30	Basic Service Charge	$ 15.79	$ 16.40	$ 0.61	3.9%	$ 15.79	$ 16.40	$ 0.61	3.9%
31									
32	Commodity Rate (per M Gallon)								
33	0 - 3,000 Gallons	1.3700	1.4127	0.0427	3.1%	2.4379	2.4806	0.0427	1.8%
34	3,001 - 10,000 Gallons	1.7123	1.7550	0.0427	2.5%	3.0476	3.0903	0.0427	1.4%
35	Over 10,000 Gallons	2.1406	2.1833	0.0427	2.0%	3.8097	3.8524	0.0427	1.1%
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Supporting Schedules:

Recap Schedules:

JDH-7

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
DSIC Revenue Requirement
As of December 31, 2009

Line No.		[A] Pinal Valley	[B]	[C]	[D]
1	TEST YEAR DATA				
2					
3	Eligible DSIC Plant in Service	$ 2,500,000			
4	Accumulated Depreciation	-			
5	(Sch. 8, p. 1)				
6	*Eligible DSIC Plant Rate Base*	$ 2,500,000			
7	Required Rate of Return	9.52%			
8	(Proposed)				
9	Required Operating Income	$ 238,000			
10	(Ln. 6 x Ln. 7)				
11	Revenue Conversion Factor	1.6556			
12	(Decision No. 71845)				
13	Revenue Requirement - Return on Eligible DSIC Plant	$ 394,033			
14	(Ln. 9 x Ln. 11)				
15					
16	Depreciation on Eligible DSIC Plant	$ 45,249			
17	(Sch. 8, p. 1)				
18					
19	Total Revenue Requirement	$ 439,282			
20	(Ln. 13 + Ln. 16)				
21					
22	*Total Operating Revenue*	16,574,910			
23					
24	Maximum increase cap	7.5%			
25					
26	Total Operating Revenue Limited by cap	$ 1,243,118			
27	(Ln. 22 X Ln. 24)				
28					
29	Total Revenue Requirement lesser of L 19 or 26	$ 439,282			
30					
31					
32			PINAL VALLEY (CASA GRANDE/COOLIDGE)		
33			Current		
34			Rates	Proposed Rates	
35					
36			Decision No.		Total
37	5/8 X 3/4-INCH RESIDENTIAL METER		71845	DSIC	[B + C]
38	Basic Service Charge		$ 15.79	$ 0.61	$ 16.40
39	Commodity Rate (Per M Gallon)				
40	0 - 3,000 Gallons		$ 1.3700	$ 0.0427	1.4127
41	3,001 - 10,000 Gallons		$ 1.7123	$ 0.0427	1.7550
42	Over 10,000 Gallons		$ 2.1406	$ 0.0427	2.1833
43					
44					
45					
46			PINAL VALLEY (STANFIELD)		
47			Current		
48			Rates	Proposed Rates	
49					
50			Decision No.		Total
51	5/8 X 3/4-INCH RESIDENTIAL METER		71845	DSIC	[B + C]
52	Basic Service Charge		$ 15.79	$ 0.61	$ 16.40
53	Commodity Rate (Per M Gallon)				
54	0 - 3,000 Gallons		$ 2.4379	$ 0.0427	2.4806
55	3,001 - 10,000 Gallons		$ 3.0476	$ 0.0427	3.0903
56	Over 10,000 Gallons		$ 3.8097	$ 0.0427	3.8524
57					
58					
59	Average Residential Bill (5/8 x 3/4 meter) - Casa Grande / Cooldige (9,062 gallons of usage)		$ 30.28	$ 0.99	$ 31.27
60					
61	Average Residential Bill (5/8 x 3/4 meter) - Stanfield (9,062 gallons of usage)		$ 41.58	$ 0.99	$ 42.57
62					
63					

Supporting Schedules:

C:\Documents and Settings\jharris\My Documents\2010 Rate Case Testimony\DSIC Support\DSIC calculation example.xlsx\5-Revenue Req
Processing Date: 12/27/2010 4:43 PM

Recap Schedules:

JDH-8

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Off-site Facilities Fee Overview

Line No.	[A]	[B]	[C]	[D]	[E]
1	ESTIMATED OFF-SITE FACILITIES				
2					Estimated
3					Cost
4					
5		Wells			4,070,000
6		Pumping and Treatment Structures			
7		and Equipment			50,190,000
8		Storage Tanks			4,910,000
9		Booster Stations			3,330,000
10		Transmission and Distribution Mains			19,290,000
11				Total:	$81,790,000

Off-Site Facilities Fee by Meter Size

Line No.	Meter Size	Meter Multiplier	Fee
19	5/8 & 3/4-inch	1	$3,500
20	3/4-inch	1.5	$5,250
21	1-inch	2.5	$8,750
22	1.5-inch	5	$17,500
23	2-inch	8	$28,000
24	3-inch	16	$56,000
25	4-inch	25	$87,500
26	6-inch & Larger	50	$175,000

Line No.	[F] Year	[G] No. of Customers	[H] Annual Fees	[I] Estimated Cumulative Fees	[J] Estimated Construction Expenditures[1]	[K] Estimated Fund Balance
18	2012	28,558	-	-	-	-
19	2013	28,872	1,098,350	1,098,350	-	1,098,350
20	2014	29,189	1,110,419	2,208,768	-	2,208,768
21	2015	29,510	1,122,621	3,331,389	1,753,640	1,577,749
22	2016	30,158	2,269,914	5,601,303	1,771,172	2,076,491
23	2017	30,821	2,319,801	7,921,104	1,788,884	2,607,408
24	2018	31,499	2,370,784	10,291,888	1,806,773	3,171,419
25	2019	32,191	2,422,887	12,714,775	3,411,763	2,182,543
26	2020	32,898	2,476,136	15,190,911	1,843,089	2,815,590
27	2021	33,621	2,530,555	17,721,465	3,895,368	1,450,776
28	2022	34,360	2,586,169	20,307,635	3,973,275	63,671
29	2023	35,881	5,323,676	25,631,310	3,656,796	1,730,550
30	2024	37,470	5,559,343	31,190,654	3,166,796	4,123,098
31	2025	39,128	5,805,443	36,996,097	6,200,755	3,727,786
32	2026	40,860	6,062,438	43,058,535	4,249,153	5,541,071
33	2027	43,035	7,612,504	50,671,039	-	13,153,575
34	2028	45,326	8,017,718	58,688,757	4,014,449	17,156,844
35	2029	47,915	9,060,031	67,748,787	7,324,051	18,892,824
36	2030	50,751	9,927,946	77,676,733	6,525,755	22,295,015
37	2031	53,929	11,121,398	88,798,131	22,476,793	10,939,619
38	2032	57,423	12,229,461	101,027,592	23,169,080	-

40 [1] Future year construction expenditures at projected future costs

N:\2010_Rate_Case\Work Papers\Off-site Facilities Fee\Off-Site Facilities Fee exhibits 12.22.10.xlsx\Revised ACC Attachment 2
Processing Date: 12/27/2010 5:26 PM

JDH-9

ARIZONA WATER COMPANY
Docket No. W-01445A-10-XXXX
Off-site Facilities Fee Overview

Line No.	Community/City	Facilities Fee
1		
2	Tempe	$ 1,266
3		
4	Buckeye	1,331
5		
6	Mesa	2,220
7		
8	Anthem	3,000
9		
10	Phoenix Metro Average	3,094
11		
12	***Pinal Valley System(Proposed)***	***3,500***
13		
14	City of Peoria	3,905
15		
16	Scottsdale	4,408
17		
18	Gilbert	4,652
19		
20	Avondale	5,251
21		
22	Chandler	5,542
23		
24		
25		
26		
27		
28	Source:	
29	City of Mesa 2007 Impact Fee Study, City of Peoria, City of Scottsdale, City of Avondale	

JDH-10

TARIFF SCHEDULE

ARIZONA WATER COMPANY *Phoenix, Arizona*		A.C.C. No.	
		Cancelling A.C.C. No.	None
Filed by:	William M. Garfield	Tariff or Schedule No.	
Title:	President	Filed:	December 29, 2010
Date of Original Filing:	December 29, 2010	Effective:	
System:	**PINAL VALLEY (COOLIDGE, CASA GRANDE, STANFIELD, ARIZONA CITY)**		

OFF-SITE FACILITIES FEE

I. ***APPLICABILITY***

An Off-site Facilities Fee ("Facilities Fee") is payable by all Applicants for Service Connections: (a) to premises not previously served, (b) to premises in residential subdivision developments, (c) to all newly created lots or parcels resulting from lot splits or further subdivision of land parcels, (d) for additional Service Connections to existing premises and, (e) for increases in size of meters or Service Connections to existing premises.

II. ***PURPOSE***

The purpose of this Tariff Schedule is to authorize the Company to collect a Facilities Fee from applicants for Service Connections for the costs of designing and constructing, or acquiring, future Water Infrastructure Facilities to provide water supply, production, treatment, transmission, distribution, storage, pressure, and flow for the Pinal Valley System. The Facilities Fee is applicable to all Service Connections established after the effective date of this tariff schedule.

III. ***DEFINITIONS***

Except as set forth below, the definitions provided in R-14-2-401 of the Arizona Corporation Commission ("Commission") rules and regulations governing water utilities shall apply in interpreting this tariff schedule.

"Applicant" means any party entering into an agreement with the Company for the installation of a Service Connection or for the increase in meter size of an existing Service Connection.

"Water Infrastructure Facilities" means water treatment and supply facilities, including but not limited to, wells, booster pumps, transmission and distribution mains larger than 10 inches in diameter, storage and pressure tanks, and related real property, rights-of-way and appurtenances constructed after the effective date of this Tariff.

"Company" means Arizona Water Company.

"Main Extension Agreement" means any agreement with the Company for the installation of water facilities which requires Commission approval.

"Service Connection" means and includes all new, permanent service connections for general metered service purposes. Should a temporary service later become a permanent service it will be considered a Service Connection at that time and be subject to this tariff.

IV. AMOUNT OF FACILITIES FEE

Applicants for Service Connections shall pay Facilities Fees based on the meter sizes shown in the following table:

GENERAL METERED SERVICES		
Meter Size	**Factor**	**Fee**
⅝" x ¾"	1	$3,500
¾"	1.5	$5,250
1"	2.5	$8,750
1-1/2"	5	$17,500
2"	8	$28,000
3"	16	$56,000
4"	25	$87,500
6" or larger	50	$175,000

V. TERMS AND CONDITIONS

(A) Time of Payment:

(1) Applicants entering into a Main Extension Agreement with the Company shall pay the total amount of the Facilities Fee within 15 calendar days after receipt of notification from the Company that the Commission has approved the Main Extension Agreement. If an Applicant fails to pay the Facilities Fees within such 15 calendar days, the Company may suspend or terminate the Main Extension Agreement.

(2) If an Applicant is not required to enter into a Main Extension Agreement, the applicant shall pay in full all Facilities Fees at the time of application for service.

(B) Payment for increased meter or Service Connection size: Facilities Fees shall be paid for all increases in size of existing meters or Service Connections, with the amount of the Facilities Fee being the difference between the Facilities Fee previously paid for the existing meter or Service Connection and the Facilities Fee applicable to the increased meter or Service Connection size.

(C) Failure to Pay Facilities Fees: The Company will not be obligated to install a meter or otherwise be required to establish service if the Applicant has not paid in full all Facilities Fees as required under this tariff schedule.

(D) Accounting for Facilities Fees: Facilities Fees shall be recorded in a deferred liability account until recorded in contributions in aid of construction when the Water Infrastructure Facilities have been completed and recorded as utility plant. The Company shall maintain in its accounting records the amount of Facilities Fees collected and their application to Water Infrastructure Facilities. Facilities Fees shall be non-refundable and all Facilities Fees collected will be applied to the cost of designing and constructing, or acquiring, Water Infrastructure Facilities.

(E) Facilities Fees are in Addition to Other Charges: Facilities Fees are in addition to the amounts to be advanced or contributed pursuant to any agreement for the installation of water facilities, including water infrastructure facilities required for an Applicant's specific project, and are in addition to other charges and fees required to be paid pursuant to other applicable Company tariffs.

(F) Disposition of Excess Funds: After all necessary and desirable off-site facilities are constructed utilizing funds collected pursuant to the Facilities Fee, or if the Facilities Fee has been terminated by order of the Commission, any funds remaining shall be refunded. The manner of the refund shall be determined by the Commission at the time a refund becomes necessary.

(G) Status Reporting Requirements to the Commission: The Company will submit a calendar year Facilities Fee status report each April 15th to Docket Control for the prior twelve (12) month period until the Facilities Fee is no longer in effect. This status report will contain a list of all customers that have paid the Facilities Fee, the amount each has paid, the amount of money spent from the account, the amount of interest earned on the account, and a list of all facilities that have been installed utilizing the Facilities Fee during the 12-month period.

Exhibit
A

Report Card for American Infrastrucure ***produced by American Society of Civil Engineers***

Drinking Water

America's drinking water systems face an annual shortfall of at least $11 billion to replace aging facilities that are near the end of their useful lives and to comply with existing and future federal water regulations. This does not account for growth in the demand for drinking water over the next 20 years. Leaking pipes lose an estimated 7 billion gallons of clean drinking water a day.

WATER AND ENVIRONMENT
DRINKING WATER
2009 GRADE
D-

Solutions

- Increase funding for water infrastructure system improvements and associated operations through a comprehensive federal program;
- Create a Water Infrastructure Trust Fund to finance the national shortfall in funding of infrastructure systems under the Clean Water Act and the Safe Drinking Water Act, including storm-water management and other projects designed to improve the nation's water quality;
- Employ a range of financing mechanisms, such as appropriations from general treasury funds, issuance of revenue bonds and tax exempt financing at state and local levels, public-private partnerships, state infrastructure banks, and user fees on certain consumer products as well as innovative financing mechanisms, including broad-based environmental restoration taxes to address problems associated with water pollution, wastewater management and treatment, and storm-water management.

Conditions

The nation's drinking-water systems face staggering public investment needs over the next 20 years. Although America spends billions on infrastructure each year, drinking water systems face an annual shortfall of at least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations. The shortfall does not account for any growth in the demand for drinking water over the next 20 [tip:years.=Fix that leak!
A faucet dripping just once per second will waste as much as 2,700 gallons of water per year. Fix any leaking faucets.]

Of the nearly 53,000 community water systems, approximately 83% serve 3,300 or fewer people. These systems provide water to just 9% of the total U.S. population served by all community systems. In contrast, 8% of community water systems serve more than 10,000 people and provide water to 81% of the population served. Eighty-five percent (16,348) of nontransient, noncommunity water systems and 97% (83,351) of transient noncommunity water systems serve 500 or fewer people. These smaller systems face huge financial, technological, and managerial challenges in meeting a growing number of federal drinking-water regulations.

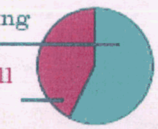
In 2002, the U.S. Environmental Protection Agency (EPA) issued The Clean Water and Drinking Water Infrastructure Gap Analysis, which identified potential funding gaps between projected needs and spending from 2000 through 2019. This analysis estimated a potential 20-year funding gap for drinking water capital expenditures as well as operations and maintenance, ranging from $45 billion to $263 billion, depending on spending levels. Capital needs alone were pegged at $161 billion.

The Congressional Budget Office (CBO) concluded in 2003 that "current funding from all levels of government and current revenues generated from ratepayers will not be sufficient to meet the nation's future demand for water infrastructure." The CBO estimated the nation's needs for drinking water investments at between $10 billion and $20 billion over the next 20 years.

ESTIMATED 5-YEAR FUNDING REQUIREMENTS FOR **DRINKING WATER AND WASTEWATER**

Total investment needs
$255 BILLION

Estimated spending
$146.4 BILLION
Projected shortfall
$108.6 BILLION



Case Studies

LOUISVILLE, KENTUCKY
American Recovery and Reinvestment Act Funding (/case-study/american-recovery-and-reinvestment-act-funding)

PORT ANGELES, WASHINGTON
Downtown Water Main Project (/case-study/downtown-water-main-project)

ORANGE COUNTY, CALIFORNIA
Groundwater Replenishment System (/case-study/groundwater-replenishment-system)

In 1996, Congress enacted the drinking-water state revolving loan fund (SRF) program. The program authorizes the EPA to award annual capitalization grants to states. States then use their grants (plus a 20% state match) to provide loans and other assistance to public water systems. Communities repay loans into the fund, thus replenishing the fund and making resources available for projects in other communities. Eligible projects include installation and replacement of treatment facilities, distribution systems, and some storage facilities. Projects to replace aging infrastructure are eligible if they are needed to maintain compliance or to further public health protection goals.

Federal assistance has not kept pace with demand, however. Between FY 1997 and FY 2008, Congress appropriated approximately $9.5 billion for the SRF. This 11-year total is only slightly more than the annual capital investment gap for each of those years as calculated by the EPA in 2002.

Design Life of Drinking Water Systems

COMPONENTS	YEARS OF DESIGN LIFE
Reservoirs and Dams	50–80
Treatment Plants—Concrete Structures	60–70
Treatment Plants—Mechanical and Electrical	15–25
Trunk Mains	65–95
Pumping Stations—Concrete Structures	60–70
Pumping Stations—Mechanical and Electrical	25
Distribution	60–95

SOURCE US EPA Clean Water and Drinking Water Infrastructure Gap Analysis Report, September 2002

Water Usage: 1950 and 2000

	1950	2000	PERCENT CHANGE
Population (Millions)	93.4	242	159%
Usage (Billions of Gallons per Day)	14	43	207%
Per Capita Usage (Gallons per Person per Day)	149	179	20%

SOURCE US EPA Clean Water and Drinking Water Infrastructure Gap Analysis Report, September 2002

Resilience

Drinking water systems provide a critical public health function and are essential to life, economic development, and growth. Disruptions in service can hinder disaster response and recovery efforts, expose the public to water-borne contaminants, and cause damage to roadways, structures, and other infrastructure, endangering lives and resulting in billions of dollars in losses.

The nation's drinking-water systems are not highly resilient; present capabilities to prevent failure and properly maintain or reconstitute services are inadequate. Additionally, the lack of investment and the interdependence on the energy sector contribute to the lack of overall system resilience. These shortcomings are currently being addressed through the construction of dedicated emergency power generation at key drinking water utility facilities, increased connections with adjacent utilities for emergency supply, and the development of security and criticality criteria. Investment prioritization must take into consideration system vulnerabilities, interdependencies, improved efficiencies in water usage via market incentives, system robustness, redundancy, failure consequences, and ease and cost of recovery.

Conclusion

The nation's drinking-water systems face staggering public investment needs over the next 20 years. Although America spends billions on infrastructure each year, drinking water systems face an annual shortfall of at least $11 billion in funding needed to replace aging facilities that are near the end of their useful life and to comply with existing and future federal water regulations. The shortfall does not account for any growth in the demand for drinking water over the next 20 years.

Of the nearly 53,000 community water systems, approximately 83% serve 3,300 or fewer people. These systems provide water to just 9% of the total U.S. population served by all community systems. In contrast, 8% of community water systems serve more than 10,000 people and provide water to 81% of the population served. Eighty-five percent (16,348) of nontransient, noncommunity water systems and 97% (83,351) of transient noncommunity water systems serve 500 or fewer people. These smaller systems face huge financial, technological, and managerial challenges in meeting a growing number of federal drinking-water regulations.

In 2002, the U.S. Environmental Protection Agency (EPA) issued The Clean Water and Drinking Water Infrastructure Gap Analysis, which identified potential funding gaps between projected needs and spending from 2000 through 2019. This analysis estimated a potential 20 -year funding gap for drinking water capital expenditures as well as operations and maintenance, ranging from $45 billion to $263 billion, depending on spending levels. Capital needs alone were pegged at $161 billion.

The Congressional Budget Office (CBO) concluded in 2003 that "current funding from all levels of government and current revenues generated from ratepayers will not be sufficient to meet the nation's future demand for water infrastructure." The CBO estimated the nation's needs for drinking water investments at between $10 billion and $20 billion over the next 20 years.

In 1996, Congress enacted the drinking-water state revolving loan fund (SRF) program. The program authorizes the EPA to award annual capitalization grants to states. States then use their grants (plus a 20% state match) to provide loans and other assistance to public water systems. Communities repay loans into the fund, thus replenishing the fund and making resources available for projects in other communities. Eligible projects include installation and replacement of treatment facilities, distribution systems, and some storage facilities. Projects to replace aging infrastructure are eligible if they are needed to maintain compliance or to further public health protection goals.

Federal assistance has not kept pace with demand, however. Between FY 1997 and FY 2008, Congress appropriated approximately $9.5 billion for the SRF. This 11-year total is only slightly more than the annual capital investment gap for each of those years as calculated by the EPA in 2002.

Sources

1. Congressional Research Service, Safe Drinking Water Act: Selected Regulatory and Legislative Issues, April 2008.
2. U.S. Environmental Protection Agency, The Clean Water and Drinking Water Infrastructure Gap Analysis, September 2002.
3. U.S. Congressional Budget Office, Future Investment in Drinking Water and Wastewater Infrastructure, May 2002.
4. G. Tracy Mehan, Testimony before the Subcommittee on Water Resources and Environment, U.S. House Transportation and Infrastructure Committee, February 2009.

Report Card for American Infrastrucure *produced by American Society of Civil Engineers*

Arizona

Top Three Infrastructure Concerns:

1. Roads
2. Drinking Water
3. Mass Transit

Key Infrastructure Facts

Arizona Transportation Report Card - 2004 (http://www.azsce.org/downloads/AZSCE_2004_Infrastructure_Report_Card_f3.pdf)

- 12% of Arizona's bridges are structurally deficient or functionally obsolete.
- There are 96 high hazard dams in Arizona. A high hazard dam is defined as a dam whose failure would cause a loss of life and significant property damage.
- 43 of Arizona's 248 dams are in need of rehabilitation to meet applicable state dam safety standards.
- 29% of high hazard dams in Arizona have no emergency action plan (EAP). An EAP is a predetermined plan of action to be taken including roles, responsibilities and procedures for surveillance, notification and evacuation to reduce the potential for loss of life and property damage in an area affected by a failure or mis-operation of a dam.
- Arizona's drinking water infrastructure needs an investment of $9.12 billion over the next 20 years.
- Arizona ranked 33rd in the quantity of hazardous waste produced and 27th in the total number of hazardous waste producers.
- Arizona reported an unmet need of $8.6 million for its state public outdoor recreation facilities and parkland acquisition.
- 21% of Arizona's roads are in poor or mediocre condition.
- 41% of Arizona's major urban highways are congested.
- Vehicle travel on Arizona's highways increased by 78% from 1990 to 2007.
- Arizona has $4.57 billion in wastewater infrastructure needs.

Sources

***Survey of the state's ASCE members conducted in September 2008**

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National Biennial RCRA Hazardous Waste Report, Environmental Protection Agency, 2007.
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TRIP Fact Sheet, March 2009.
Clean Water Needs Survey, Environmental Protection Agency, 2004.

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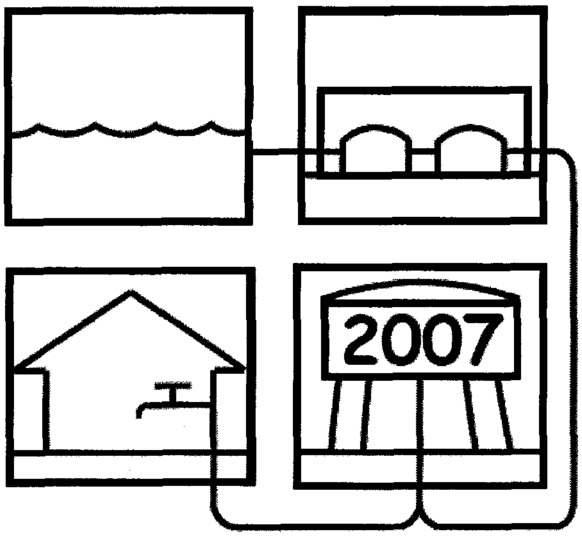
Exhibit
B

Drinking Water Infrastructure Needs Survey and Assessment

Fourth Report to Congress

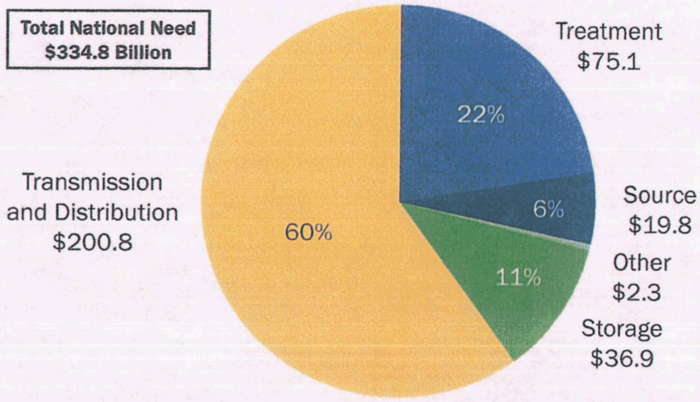


U.S. Environmental Protection Agency
Office of Water
Office of Ground Water and Drinking Water
Drinking Water Protection Division
Washington, D.C. 20460

Total National Need by Project Type

Infrastructure needs of water systems can be grouped into four major categories based on project type. These project types are source, transmission and distribution, treatment, and storage. Each category fulfills an important function in delivering safe drinking water to the public. Most needs were assigned to one of these categories. An additional "other" category is composed of projects that do not fit into one of the four categories. Exhibit 1.4 shows the total national need by project type. Exhibit 1.5 shows the total national need by water system size and type, as well as by project type.

Exhibit 1.4: Total 20-Year Need by Project Type (in billions of January 2007 dollars)



Note: Numbers may not total due to rounding.

Exhibit 1.5: Total 20-Year Need by System Size and Type and Project Type (in billions of January 2007 dollars)

System Size and Type	Distribution and Transmission	Treatment	Storage	Source	Other	Total Need
Large Community Water Systems (serving over 100,000 persons)*	$72.5	$26.6	$9.9	$6.5	$0.9	$116.3
Medium Community Water Systems (serving 3,301 to 100,000 persons)*	$91.5	$29.8	$15.9	$7.1	$0.8	$145.1
Small Community Water Systems (serving 3,300 and fewer persons)	$34.7	$10.3	$8.5	$5.2	$0.6	$59.4
Not-for-Profit Noncommunity Water Systems†	$0.5	$0.8	$1.9	$0.8	$0.0	$4.1
Total State Need	**$199.2**	**$67.6**	**$36.3**	**$19.6**	**$2.3**	**$324.9**
American Indian and Alaskan Native Village Water Systems†	$1.6	$0.6	$0.6	$0.2	$0.0	$2.9
Costs Associated with Proposed and Recently Promulgated Regulations (taken from EPA economic analyses)		$7.0				$7.0
Total National Need	**$200.8**	**$75.1**	**$36.9**	**$19.8**	**$2.3**	**$334.8**

Note: Numbers may not total due to rounding.
* "Large" and "medium" community water systems are defined differently for this Assessment than in previous Assessments. See Appendix A for more information.
† Based on 1999 Assessment findings adjusted to 2007 dollars.

Exhibit 2.1: State 20-Year Need Reported by Project Type (in millions of January 2007 dollars)

State	Transmission/ Distribution	Source	Treatment	Storage	Other	Total
Alabama	$3,343.9	$71.6	$386.5	$285.3	$12.0	$4,099.4
Alaska	$478.2	$56.4	$121.3	$150.0	$6.5	$812.4
Arizona	$3,819.0	$460.3	$2,150.2	$900.1	$81.1	$7,410.7
Arkansas	$3,667.5	$149.3	$966.0	$478.3	$17.4	$5,278.5
California	$22,988.5	$2,515.3	$7,549.7	$5,735.6	$257.3	$39,046.3
Colorado	$3,156.7	$371.7	$2,150.2	$696.7	$24.8	$6,400.1
Connecticut	$807.1	$134.9	$280.6	$151.6	$19.7	$1,394.0
District of Columbia	$836.8	$0.0	$0.4	$35.5	$1.5	$874.2
Florida	$7,234.9	$887.3	$3,552.1	$975.4	$173.5	$12,823.1
Georgia	$6,295.6	$406.2	$1,390.5	$751.5	$93.9	$8,937.7
Illinois	$8,982.0	$1,576.3	$2,907.8	$1,386.7	$164.2	$15,017.1
Indiana	$3,814.2	$353.8	$1,096.1	$648.5	$31.8	$5,944.4
Iowa	$4,356.8	$271.9	$990.8	$467.2	$26.4	$6,113.1
Kansas	$2,784.4	$187.1	$684.1	$339.7	$35.0	$4,030.2
Kentucky	$3,643.6	$121.7	$699.0	$474.8	$38.9	$4,978.1
Louisiana	$5,100.7	$305.7	$1,024.8	$427.4	$41.3	$6,900.1
Maryland	$3,497.6	$180.6	$1,134.5	$606.0	$24.7	$5,443.4
Massachusetts	$4,456.4	$340.9	$1,130.1	$823.4	$39.1	$6,790.0
Michigan	$7,657.6	$529.6	$2,548.5	$1,035.8	$71.3	$11,842.8
Minnesota	$2,819.3	$372.0	$1,982.9	$770.3	$43.9	$5,988.4
Mississippi	$1,604.4	$284.7	$907.2	$429.8	$17.2	$3,243.3
Missouri	$4,801.8	$324.7	$1,281.2	$635.7	$42.3	$7,085.6
Nebraska	$1,017.7	$140.5	$309.2	$300.8	$8.4	$1,776.6
Nevada	$1,116.4	$892.3	$202.2	$460.6	$19.8	$2,691.3
New Jersey	$4,722.9	$307.1	$1,850.4	$1,056.7	$24.7	$7,961.6
New York	$15,417.0	$1,915.5	$6,986.2	$2,707.8	$110.9	$27,137.3
North Carolina	$6,037.1	$670.7	$2,237.7	$1,032.7	$77.1	$10,055.2
Ohio	$8,374.2	$564.2	$2,235.6	$1,330.4	$94.6	$12,599.0
Oklahoma	$2,603.5	$142.0	$858.9	$493.5	$14.1	$4,112.1
Oregon	$1,520.6	$156.3	$546.1	$536.0	$26.2	$2,785.3
Pennsylvania	$7,644.9	$557.1	$1,834.5	$1,284.2	$58.7	$11,379.3
Puerto Rico	$1,079.5	$80.6	$1,037.4	$325.2	$14.8	$2,537.5
South Carolina	$1,102.7	$75.2	$222.3	$210.2	$17.9	$1,628.3
Tennessee	$2,356.3	$109.2	$692.8	$368.0	$21.2	$3,547.6
Texas	$15,950.2	$1,600.3	$5,785.2	$2,695.8	$99.2	$26,130.8
Virginia	$3,806.3	$196.0	$1,293.3	$722.8	$43.6	$6,061.9
Washington	$5,765.5	$717.3	$1,580.0	$1,502.7	$190.6	$9,756.0
Wisconsin	$3,550.5	$385.1	$1,467.5	$758.7	$24.2	$6,186.0
Partially Surveyed States*	$10,478.1	$1,131.1	$3,347.3	$2,099.5	$136.3	$17,192.4
Subtotal	***$198,690.3***	***$19,542.3***	***$67,421.3***	***$36,091.3***	***$2,246.3***	***$323,991.4***
American Samoa	$43.7	$10.6	$15.9	$22.0	$0.6	$92.8
Guam	$223.6	$2.0	$8.6	$29.7	$0.0	$263.9
Commonwealth of the Northern Mariana Islands	$123.2	$28.7	$61.8	$65.8	$9.7	$289.3
U.S. Virgin Islands	$138.3	$7.1	$45.9	$59.8	$2.3	$253.3
Subtotal	***$528.8***	***$48.4***	***$132.2***	***$177.2***	***$12.7***	***$899.4***
Total State Need	**$199,219.1**	**$19,590.7**	**$67,553.5**	**$36,268.5**	**$2,259.0**	**$324,890.8**

* For the 2007 DWINSA the need for states that opt out of the medium system portion of the survey is presented cumulatively and not by state. The list of the 14 partially surveyed states can be seen in Exhibit 2.4.

Exhibit
C

NOTICES

Petition of Philadelphia Suburban Water Company for Approval to Implement a Tariff Supplement Establishing a Distribution System Improvement Charge; Doc. No. P-00961036

[26 Pa.B. 4490]

***Commissioners Present*: John M. Quain, Chairperson; Lisa Crutchfield, Vice Chairperson; John Hanger; Robert K. Bloom**

Public meeting held
August 22, 1996

Opinion and Order

By the Commission:

I. *Background*

On March 20, 1996, the Philadelphia Suburban Water Company (PSWC or company) filed the above-referenced petition with this Commission requesting regulatory approval to file and implement an automatic adjustment clause tariff that would establish a Distribution System Improvement Charge (DSIC or surcharge) under section 1307(a) of the Public Utility Code. 66 Pa.C.S. § 1307(a). Section 1307 (a) provides statutory authority for a utility to establish, subject to Commission review and approval, a tariffed automatic adjustment clause mechanism designed to provide "a just and reasonable return on the rate base" of the public utility.

As proposed by PSWC, the DSIC would operate to recover the fixed costs (depreciation and pre-tax return) of certain nonrevenue producing, nonexpense reducing infrastructure rehabilitation projects completed and placed in service between section 1308 base rate cases. The company maintains that the property additions eligible for the DSIC will be limited to revenue neutral infrastructure projects, consisting principally of replacement investments in so-called "mass property" accounts. The DSIC is designed to provide the company with the resources it needs to accelerate its investment in new utility plant to replace aging water distribution infrastructure, facilitating compliance with evolving regulatory requirements imposed by the Safe Drinking Water Act (SDWA) and the implementation of solutions to regional water supply problems.

To illustrate its point, the company states that it has 3,180 miles of mains, that it is currently rehabilitating approximately 15 miles of main each year, and that, at that pace, it would require approximately 212 years to make all of the needed improvements to existing facilities. The company also states that water service, more than any other utility service, is critical to maintaining public health as water is "a necessity of life and vital for public fire protection services." Petition at 3.

The company alleges that the DSIC may enable it to break out of a cycle, imposed on it by its capital investment needs, of filing base rate relief every 15 months. Any reduction in rate case filing frequency would generate costs savings which would inure to the benefit of customers and the Commission. In its petition, the company proposes certain accounts for recovery, time-frames and other procedures to be followed in implementing the DSIC. The details of those procedures will be discussed below.

To begin with, the company proposes that the DSIC become effective for service rendered on and after July 1, 1996. The company also proposes that the initial charge to be calculated would recover the fixed costs of eligible plant additions that have not previously been reflected in the company's rate base and will have been placed in service between January 1, 1996 and May 31, 1996. Thereafter, the company proposes to update the DSIC on a quarterly basis to reflect eligible plant additions placed in service during the 3-month periods ending 1 month prior to the effective date of each DSIC update. Petition at 3-4.

The company also proposes that the DSIC be capped at 5% of the amount billed to customers under otherwise applicable rates and charges, exclusive of amounts recovered under the State Tax Adjustment Surcharge (STAS). If the cap is reached, the company would not seek any additional increases. Petition at 4.

As with any section 1307 automatic adjustment clause, the DSIC will be subject to an annual reconciliation, whereby the revenue received under the DSIC for the reconciliation period will be compared to the Company's eligible costs for that period. The difference between such revenues and costs will be recouped or refunded to customers, as appropriate, in accordance with section 1307(e). Petition at 5.

Lastly, in terms of procedures, the company proposes that the DSIC will be reset to zero as of the effective date of new section 1308 base rates that provide for prospective recovery of the annual costs that had previously been recovered under the DSIC. Petition at 5. And to avoid over recovery of costs in the absence of a base rate case, the company also proposed that the DSIC will be reset to zero if, in any quarter, data filed with the Commission in the company's then most recent Annual or Quarterly Earnings Report shows that the company will earn a rate of return that would exceed the rate of return used to calculate its fixed costs under the DSIC. Petition at 5.

In terms of the legal issues raised by its petition, the company also states that its proposed automatic adjustment clause and procedures are lawful for a number of reasons found in statutory and case law. With regard to statutory law, PSWC states that section 1307(a) of the Public Utility Code, 66 Pa.C.S. § 1307(a), provides that a company may establish a sliding scale of rates or such other method for the automatic adjustment of the rates to recover a variety of costs. Petition at 19. Moreover, the company has cited circumstances in which the Commission has authorized the use of section 1307(a) automatic adjustment clauses to recover a wide array of expenses, depreciation and capital costs. See *Pennsylvania Industrial Energy Coalition v. Pa. P.U.C.*, 653 A.2d 1336 (Pa. Cmwlth. 1995) (PIEC) (recovery of electric utilities' demand-side management costs); 52 Pa. Code § 69.181 (recovery of gas utilities' take or pay liabilities to pipeline suppliers); 52 Pa. Code § 69.341(b) (recovery of gas utilities' gas supply realignment costs and stranded costs resulting from Federal Energy Regulatory Commission Order 636); and 52 Pa. Code § 69.353 (recovery of water utilities' principal and interest due on PennVEST obligations). Petition at 20-21.

Answers were filed by the Office of Trial Staff (OTS) (Answer filed April 9, 1996), the Office of Small Business Advocate (OSBA) (Answer filed May 3, 1996) and the Office of Consumer Advocate (OCA) (Comments and testimony filed May 6, 1996). Protests to the petition were also filed by many individual customers.

In its answer, the OTS requests that the Commission deny the company's petition based on legal and technical grounds. With regard to the legal objections, the OTS argues that, since the facilities are "new" facilities, the company is attempting to circumvent a base rate review through the use of a surcharge, in violation of the Court's decision in *PIEC*.

The OSBA's answer did not submit legal arguments opposing the implementation of the DSIC. Rather, the OSBA has requested that the Commission conduct a thorough investigation regarding the reasonableness and lawfulness of the proposed tariff supplement as they affect the company's various customer classes.

In its comments, the OCA argues against the implementation of the DSIC alleging that the company does not need the DSIC mechanism and that implementation of a DSIC mechanism would provide in excess of a fair return to the company. With regard to legal arguments, OCA challenges the legality of the surcharge based upon the same arguments outlined in OTS' answer based on its interpretation of section 1307(a) and the *PIEC* decision.

On May 30, 1996, the company filed a reply with the Commission addressing the comments raised in the answers filed by OTS, OSBA and OCA. The OCA then filed a response to this reply on June 19, 1996. In PSWC's reply to the various parties concerning the legality of the DSIC, the company continued to support the legality of a surcharge under section 1307(a) of the Public Utility Code and the Commonwealth Court decision in *PIEC*, and supplied rebuttal arguments in support of its need for the DSIC and the legality of its proposal.

II. *Discussion*

At the outset of this discussion regarding the PSWC petition, we believe it necessary to clarify the Commission's view of the scope of this proceeding and the nature of the PSWC proposal. Because the PSWC petition requests regulatory approval to file and implement a certain type of automatic adjustment clause, we will not address, in this order, the specific factual issues that may be raised by the proposed tariff supplement submitted as Exhibit A to the petition. The Commission views the tariff supplement in Exhibit A as no more than the company's proposal as to how such an automatic adjustment clause should be structured. Indeed, as explained below, the specific tariff supplement proposed by PSWC will not be approved by this order.

Therefore, to the extent that parties have objections and/or complaints to the rates to be charged by means of an automatic adjustment clause that provides for the recovery of a water company's infrastructure improvement costs, those objections and/or complaints would be appropriately addressed to an actual PSWC tariff filing that contains specific rates to be charged to consumers based on specific distribution system improvement expenditures. A section 701 complaint would be the appropriate procedural vehicle to challenge such a tariff filing and, provided that factual issues are raised, the filing of such a complaint will entitle the complainant to a hearing before an administrative law judge and an adjudication of the complaint.

Thus, the key issues raised by the PSWC petition, and to be resolved in this order, are generic threshold issues regarding (1) the legality of the type of automatic adjustment clause proposed by the company and (2) the appropriate general structure of such an automatic adjustment clause that conforms to the requirement of the statute and Pennsylvania case law. In other words, this proceeding will address the legal issue concerning the adoption of the surcharge under section 1307(a) of the Code. In addition, the Commission will outline the general parameters of a surcharge mechanism that meets the requirement of the statute, that is consistent with the case law, that has adequate safeguards to protect consumers' interests and, therefore, constitutes a surcharge that is likely to receive regulatory approval when filed.

To begin with, we applaud companies who present this Commission with innovative ideas to address recurring problems for their respective industries. In the water industry, companies are faced with the dual tasks of improving the quality of the water delivered to customers due to the new mandates of the SDWA and other governmental requirements and, at the same time, maintaining an aging water utility infrastructure. We recognize that, in recent years, PSWC and other Pennsylvania water companies have been required to make significant investments in new utility plant for projects such as the filtration of surface water supplies, the replacement of aging water distribution plant and the implementation of meter replacement programs. In addition, water companies face the daunting challenge of rehabilitating their existing distribution infrastructure before the property reaches the end of its service life to avoid serious public health and safety risks.

In the Commission's judgment, the establishment of a DSIC along the lines proposed by PSWC can substantially aid the water company in meeting these challenges on behalf of the water consuming public. We agree with the company that the establishment of a DSIC would enable the company to address, in an orderly and comprehensive manner, the problems presented by its aging water distribution system, and would have a direct and positive effect upon water quality, water pressure and service reliability. For these reasons, we endorse the concept of using an automatic adjustment clause to address this regulatory problem for the water industry in Pennsylvania and, in particular, the type of DSIC proposed by PSWC.

A. *Legal Issues*

In Pennsylvania, utility costs are recovered from customers through section 1308 base rates and through section 1307 automatic adjustment clauses. The purpose of a section 1307 automatic adjustment clause is to provide an automatic mechanism enabling utilities to recover specific costs not covered by general rates. *Allegheny Ludlum Steel Corporation v. Pa. P.U.C.* 501 Pa. 71, 75 n.3, 459 A.2d 1218, 1220 n.3 (1983). Moreover, section 1307(e), 66 Pa.C.S. § 1307(e), provides that the automatic adjustment clause procedures shall include an annual report detailing the revenues collected and the expenses incurred under the automatic adjustment clause, followed by a public hearing to reconcile the amounts and to determine any refunds owed to customers or additional recovery due from customers.

Until recently, an automatic adjustment clause has usually been applied only to gas and electric companies. However, the Commission has provided for the recovery of capital costs in at least one instance to date, i.e., for PECO Energy's costs to convert oil-fired units to units which burn natural gas. *Philadelphia Electric Co. ECR No. 3*, Docket No. M-00920312 (Order adopted April 1, 1993). The Commission has also adopted a policy statement which encourages water companies to seek section 1307(a) cost recovery for their PENNVEST debt costs, 52 Pa. Code § 69.361, and policy statements approving section 1307 cost recovery for certain FERC Order 636 stranded costs, 52 Pa. Code § 69.341 (b)(4), and electric utility coal uprating costs, 52 Pa. Code § 57.124(a). Moreover, since 1970, the Commission has authorized all utilities to use an automatic adjustment clause mechanism to recover certain incremental changes in State tax rates. 52 Pa. Code § 69.44.

Pennsylvania case law regarding the permissible scope of section 1307 cost recovery, while not extensive, supports a broad interpretation of that section. In *National Fuel Gas Distribution Corp. v. Pa. P.U.C.*, 473 A.2d 1109, 1121 (Pa. Cmwlth. 1984), the Commonwealth Court held that the purpose of section 1307 of the code is to permit reflection in customer charges of changes in one component of a utility's cost of providing public service without the necessity of the "broad, costly and time-consuming inquiry" required in a section 1308 base rate case. Moreover, under the 1995 *PIEC* decision, the Commonwealth Court adopted the Commission's legal position that its use of section 1307 was not limited to fuel and purchased power costs. At the same time, the Commonwealth Court cautioned that section 1307 should have limited application and should not override the traditional ratemaking process. *PIEC* at 1349. In determining whether DSM costs could be recovered through the section 1307 mechanism, the Court wrote:

> Although we agree that Section 1307 should have limited application and the PUC should not use it to disassemble the traditional rate-making process, *the General Assembly did not limit the allowance of automatic adjustment to only fuel costs and taxes which are generally beyond the control of the utility. Instead, the General Assembly specifically allowed the recovery of fuel costs and also allowed the PUC or the utilities to initiate the automatic adjustment of costs within specific procedures* . . . In this case, Section 1319 of the Code specifically states that all prudent and reasonable costs should be recovered and sets forth requirements that the proposed programs be determined to be "prudent and cost-effective" by the PUC (or the Bureau of Conservation, Economics and Energy Planning as designated by the PUC), before any costs may be recovered through the surcharge mechanism.

PIEC at 1349 (emphasis added). The Court then concluded that the recovery of DSM costs under section 1307 was lawful because the language of section 1307 gives the Commission discretion to establish automatic adjustment clauses for the recovery of prudently incurred costs, and because in section 1319 the legislature specifically identified and provided for the recovery of prudent and reasonable costs for developing DSM programs.

Clearly, the Court in *PIEC* recognized the importance of the statute (section 1319) in providing for the recovery of development costs of the DSM programs via section 1307. However, the Court also recognized that the language of section 1307 is not limited to a narrow set of costs (as advocated by the industrials), that whether the costs at issue should be recovered via an automatic adjustment clause is a matter of Commission discretion, and that the court "is not free to substitute its discretion for the discretion properly exercised by the PUC in establishing the surcharge method." *PIEC* at 1349.

Turning to the PSWC proposal to file and implement an automatic adjustment clause to recover its distribution system improvement costs, we find that the proposal is appropriately limited and narrowly tailored to recover a specific category of utility costs--the incremental fixed costs (depreciation and pre-tax return) associated with nonrevenue producing, nonexpense reducing distribution system improvement projects completed and placed in service between base rate cases. Recovery of this narrow set of costs is clearly permitted under section 1307(a) (which has no cost category limitation in its language) and Pennsylvania case law; and, in the Commission's judgment, this proposal is in no way a mechanism to "disassemble" the traditional ratemaking process for several reasons: first, the DSIC is designed to identify and recover the distribution system improvement costs incurred between rate cases; second, the costs to be recovered represent a narrow subset of the company's total cost of service; and third, the DSIC amount will be capped at a relatively low level to prevent any long-term evasion of a base rate review of these plant costs. Indeed, the company's proposal recognizes that there will be a full review of these costs in a subsequent section 1308 base rate proceeding. We also note that the DSIC is designed to reflect only the costs of the eligible plant additions that are actually placed in service during the 3-month periods ending 1 month prior to the effective date of each surcharge update; this key provision serves to avoid any potential violation of section 1315 and this State's long-standing "used and useful" rule.

Additionally, we find that sections 1307(d) and (e) provide broad auditing powers to the Commission and a formal reconciliation mechanism to carefully monitor the operation of such a surcharge. While admittedly section 1307(d) is addressed to fuel cost adjustment audits, we do not view the Commission's auditing power over automatic adjustment clauses as limited to only fuel costs, given the broad auditing and investigative powers granted to the Commission via sections 504, 505, 506, and 516 of the Public Utility Code. 66 Pa.C.S. §§ 504, 505, 506, 516. Nor would we be likely to approve a utility's request for approval of an automatic adjustment clause in the absence of its complete agreement that the Commission has such auditing powers. Moreover, section 1307(e) provides for a mandatory annual reconciliation report regarding the revenues and expenses recovered via an automatic adjustment clause and a "public hearing on the substance of the report and any matters pertaining to the use by such public utility" of the automatic adjustment clause. As such, the costs to be recovered via the company's DSIC proposal will be subject to the Commission's auditing powers, an annual reconciliation report and public hearings.

B. *General Tariff Parameters*

The basic elements of a tariff supplement to implement a lawful DSIC mechanism include a statement of purpose and description of eligible property, a specification of its effective date and the dates of its subsequent quarterly updates, details regarding the computation methodology and appropriate consumer safeguards. The proposed tariff supplement included with the PSWC petition, as Exhibit A, includes most of these elements but, in the Commission's judgment, certain elements should be modified in order to adequately protect consumer interests and to comply with section 1307. In order to provide guidance to PSWC and any other water utility that may need to implement a DSIC, the Commission has developed sample tariff language that, if used in a water utility's section 1307 proposed tariff supplement, is likely to receive the Commission's approval. The sample tariff language is contained in Appendix A to this order.

The major differences between the tariff supplement proposed by PSWC and the sample tariff language in Appendix A can be summarized as follows:

--specification of the eligible plant accounts by type and account number;

--provision to include recovery of main extensions installed to implement solutions to regional water supply problems that have been documented as presenting a significant public health and safety concern to existing customers;

--specification that the costs of projects funded by PENNVEST loans are not eligible;

--provision of a prospective January 1, 1997 effective date for the tariff supplement and the property eligible for the initial filing;

--if more than 2 years have elapsed since the utility's last base rate case, use of the equity return rate determined by staff and specified in the latest Quarterly Earnings Report released by the Commission;

--greater specification of the depreciation and pretax return elements in the formula to calculate the DSIC;

--added provision to provide interest to consumers for any over recoveries during operation of the DSIC; and

--provision for customer notice of any DSIC changes.

Thus, use of the sample tariff language will fully explain the DSIC computation, including a listing of DSIC eligible property and related account numbers, so that in future years the purpose and intent of the DSIC surcharge will be apparent from reading only the tariff supplement. Additionally, the inclusion of plant account numbers and descriptions of property eligible for DSIC cost recovery parallels the format used for other section 1307 surcharges, such as the ECR for electric utilities, the GCR for gas distribution utilities and the SCR for steam heat companies.

With these changes to PSWC's proposal, the eligible property, filing dates, parameters, and consumer safeguards have been significantly strengthened. In particular, we note here that the provisions (1) for resetting the DSIC to zero if the company's rate of return exceeds its allowable rate of return, and (2) for resetting the DSIC to zero as of the effective date of new section 1308 base rates that provide for prospective recovery of the eligible plant costs both serve as effective and reliable rate mechanisms to insure that the DSIC automatic adjustment clause will not produce rates in excess of a fair return to the utility, as required by section 1307(a). We also note that the provision of a 5% of billed revenues cap on the maximum amount of any DSIC insures that the surcharge mechanism will not evade the section 1308 base rate process and its intensive top-to-bottom review of all company revenue, expense, rate base and return claims. See Appendix A. In other words, the 5% cap will insure that the surcharge will not allow the company to avoid a base rate review of the eligible property in perpetuity.

Accordingly, although we are denying the PSWC petition to the extent that it requests permission to file and implement a section 1307(a) tariff supplement to implement a surcharge as set forth in its Exhibit A, we invite the company to file a new tariff supplement consistent with the parameters outlined in the sample tariff language set forth in Appendix A to this order. The sample tariff language in Appendix A is identical to that recommended for the Pennsylvania-American Water Company at Docket No. P-00961031 which has also requested permission to file a DSIC surcharge.

As with other section 1307 tariff filings, the new tariff supplement would provide for a notice period of no less than 60 days to allow sufficient time for staff review of the proposed tariff supplement and its initial rates for consistency with the sample tariff language and for accuracy of the plant account, depreciation, pre-tax return and other elements of the DSIC calculation. If recommended for approval by staff and formally approved by the Commission, the tariff supplement and initial rates to implement the DSIC will be permitted to go into effect, subject to the outcome of any timely filed complaints. Subsequent quarterly updates, however, may be filed on 10 days notice as originally proposed by the company. *Therefore,*

It Is Ordered That:

1. The petition filed by the Philadelphia Suburban Water Company (PSWC) to file and implement a

section 1307(a) automatic adjustment clause tariff that would establish a Distribution System Improvement Charge (DSIC) is hereby approved in part and denied in part consistent with this order.

2. All protests, answers and other objections filed with respect to the PSWC petition are hereby granted in part and denied in part consistent with this order.

3. Any complaints regarding the rates to be charged pursuant to a DSIC tariff supplement may be filed if and when PSWC files a tariff supplement with specific rates in accordance with the tariff parameters outlined by this order.

4. The parameters set forth in the Appendix A are hereby adopted to serve as sample tariff language to be implemented for tariff supplements to establish a DSIC.

5. The normal auditing, reconciliation, reporting and public hearing procedures applicable to all 1307 (e) filings will likewise apply to all DSIC tariff supplements.

6. This order be published in the *Pennsylvania Bulletin.*

7. This order be served upon Philadelphia Suburban Water Company, the Office of Consumer Advocate, the Office of Small Business Advocate, the Office of Trial Staff and the National Association of Water Companies.

JOHN G. ALFORD,
Secretary

APPENDIX A

Sample Tariff Language

Distribution System Improvement Charge (DSIC)

I. *General Description*

Purpose: To recover the fixed costs (depreciation and pre-tax return) of certain nonrevenue producing, nonexpense reducing distribution system improvement projects completed and placed in service and to be recorded in the individual accounts, as noted below, between base rate cases and to provide the Company with the resources to accelerate the replacement of aging water distribution infrastructure, to comply with evolving regulatory requirements imposed by the Safe Drinking Water Act and to develop and implement solutions to regional water supply problems. The costs of extending facilities to serve new customers are not recoverable through the DSIC. Also, Company projects receiving PENNVEST funding are not DSIC-eligible property.

Eligible Property: The DSIC-eligible property will consist of the following:

--services (account 323), meters (account 324) and hydrants (account 325) installed as in-kind replacements for customers;

--mains and valves (account 322) installed as replacements for existing facilities that have worn out, are in deteriorated condition, or upgraded to meet Chapter 65 regulations of Title 52;

--main extensions (account 322) installed to eliminate dead ends and to implement solutions to regional water supply problems that have been documented as presenting a significant health and safety concern for customers currently receiving service from the company or the acquired Company;

--main cleaning and relining (account 322) projects; and

--unreimbursed funds related to capital projects to relocate Company facilities due to highway relocations.

Effective Date: The DSIC will become effective for bills rendered on and after January 1, 1997.

II. *Computation of the DSIC*

Calculation: The initial charge, effective January 1, 1997, shall be calculated to recover the fixed costs of eligible plant additions that have not previously been reflected in the Company's rate base and will have been placed in service between September 1, 1996, and November 30, 1996. Thereafter, the DSIC will be updated on a quarterly basis to reflect eligible plant additions placed in service during the 3-month periods ending 1 month prior to the effective date of each DSIC update. Thus, changes in the DSIC rate will occur as follows:

Effective Date of Change	**Date To Which DSIC-Eligible Plant Addition Reflected**
April 1	February 28
July 1	May 30
October 1	August 31
January 1	November 30

The fixed costs of eligible distribution system improvement projects will consist of depreciation and pre-tax return, calculated as follows:

Depreciation: The depreciation expense will be calculated by applying to the original cost of DSIC-eligible property the annual accrual rates employed in the Company's last base rate case for the plant accounts in which each retirement unit of DSIC-eligible property is recorded.

Pre-tax return: The pre-tax return will be calculated using the State and Federal income tax rates, the Company's actual capital structure and actual cost rates for long-term debt and preferred stock as of the last day of the 3-month period ending 1 month prior to the effective date of the DSIC and subsequent updates. The cost of equity will be the equity return rate approved in the Company's last fully-litigated base rate proceeding for which a final order was entered not more than 2 years prior to the effective date of the DSIC. If more than 2 years shall have elapsed between the entry of such a final order and the effective date of the DSIC, then the equity return rate used in the calculation will be the equity return rate calculated by the Commission Staff in the latest Quarterly Report on the Earnings of Jurisdictional Utilities released by the Commission.

DISC Surcharge Amount: The charge will be expressed as a percentage carried to two decimal places and will be applied to the total amount billed to each customer under the Company's otherwise applicable rates and charges, excluding amounts billed for public fire protection service and the State Tax Adjustment Surcharge (STAS). To calculate the DSIC, one-fourth of the annual fixed costs associated with all property eligible for cost recovery under the DSIC will be divided by the Company's projected revenue for sales of water for the quarterly period during which the charge will be collected, exclusive of revenues from public fire protection service and the STAS.

Formula: The formula for calculation of the DISC surcharge is as follows:

$$DSIC = \frac{(DSI \times PTRR) + Dep + e}{PQR}$$

Where:

DSI = the original cost of eligible distribution system improvement projects.

PTRR = the pre-tax return rate applicable to eligible distribution system improvement projects.

Dep = Depreciation expense related to eligible distribution system improvement projects.

e = the amount calculated under the annual reconciliation feature as described below.

PQR = Projected quarterly revenue including any revenue from acquired companies that are now being charged the rates of the acquiring company.

Quarterly updates: Supporting data for each quarterly update will be filed with the Commission and served upon the Office of Trial Staff, the Office of Consumer Advocate and the Office of Small Business Advocate at least 10 days prior to the effective date of the update.

III. *Safeguards*

Cap: The DSIC will be capped at 5% of the amount billed to customers under otherwise applicable rates and charges.

Audit/Reconciliation: The DSIC will be subject to audit at intervals determined by the Commission. It will also be subject to annual reconciliation based on a reconciliation period consisting of the 12 months ending December 31 of each year. The revenue received under the DSIC for the reconciliation period will be compared to the Company's eligible costs for that period. The difference between revenue and costs will be recouped or refunded, as appropriate, in accordance with section 1307(e), over a 1 year period commencing on April 1 of each year. If DSIC revenues exceed DSIC-eligible costs, such overcollections will be refunded with interest. Interest on the overcollections will be calculated at the residential mortgage lending specified by the Secretary of Banking in accordance with the Loan Interest and Protection Law (41 P. S. § 101, et seq.) and will be refunded in the same manner as an overcollection.

New Base Rates: The charge will be reset at zero as of the effective date of new base rates that provide for prospective recovery of the annual costs that had theretofore been recovered under the DSIC. Thereafter, only the fixed costs of new eligible plant additions, that have not previously been reflected in the Company's rate base, would be reflected in the quarterly updates of the DSIC.

Earning Reports: The charge will also be reset at zero if, in any quarter, data filed with the Commission in the Company's then most recent Annual or Quarterly Earnings reports show that the Company will earn a rate of return that would exceed the allowable rate of return used to calculate its fixed costs under the DSIC as described in the Pre-tax return section.

Customer Notice: Customers shall be notified of changes in the DSIC by including appropriate information on the first bill they receive following any change. An explanatory bill insert shall also be included with the first billing.

[Pa.B. Doc. No. 96-1560. Filed for public inspection September 13, 1996, 9:00 a.m.]

Exhibit
D

ARIZONA WATER COMPANY
DSIC-type Mechanisms by State

Line No.	State	Program	Frequency	Surcharge Cap	Included Plant
1					
2	Indiana	Distribution System Improvement Charge (DSIC)	Annually	5.0%	Mains, hydrants, services, meters
3					
4	Illinois	Qualifying Infrastructure Plant Surcharge (QIPS)	Annually	5.0%	Mains, hydrants, services, meters
5					
6	Missouri	Infrastructure System Replacement Surcharge (ISRS)	Semi-Annually	10.0%	Mains (includes relining), valves, hydrants, facility relocations
7					
8	Ohio	System Infrastructure Charge	Annually	3.0%	Mains (includes cleaning, relining, & extensions), valves, hydrants, services, land/land rights, relc
9					
10	Pennsylvania	Distribution System Improvement Charge (DSIC)	Quarterly	7.5%	Mains, valves, services, meters
11					
12	California	Distribution System Improvement Charge (DSIC)	Quarterly	7.0%	Wells, pumps, mains, hydrants, services, meters, tools & equipment
13					
14	Delaware	Distribution System Improvement Charge (DSIC)	Semi-Annually	7.5%	Mains, valves, hydrants, services, meters
15					
16	Connecticut	Water Infrastructure Conservation Adjustment (WICA)	Semi-Annually	5.0%	Mains (includes cleaning & relining), valves, services, hydrants, meters, leak detection equipmen
17					
18					
19					
20					
21					
22					

Exhibit
E

Resolution Endorsing and Co-Sponsoring "The Distribution System Improvement Charge"

WHEREAS, The Pennsylvania Public Utility Commission and the Pennsylvania Legislature have adopted a promising and unique regulatory approach that encourages the acceleration of the needed remediation of aging water utility infrastructures; *and*

WHEREAS, The Distribution System Improvement Charge is an automatic adjustment charge that enables recovery of infrastructure improvement costs on a quarterly basis in between rate cases for projects that are non-revenue producing and non-expense reducing such as main cleaning and relining, fire hydrant replacement and main extensions to eliminate dead ends; *and*

WHEREAS, A videotape which explains this unique approach is being prepared by the National Association of Water Companies to help educate and inform other regulatory agencies and legislatures about the benefits of this unique approach; *and*

WHEREAS, The U.S. EPA within its Drinking Water Infrastructure Needs Survey has identified a magnitude of national infrastructure needs of $77.2 billion in pending expenditures; *and*

WHEREAS, As the magnitude of need may be too great to be accomplished under traditional ratemaking methodologies; *and*

WHEREAS, The Distribution System Improvement Charge provides benefits to ratepayers such as improved water quality, increased pressure, fewer main breaks, fewer service interruptions, lower levels of unaccounted for water, and more time between rate cases which leads to greater rate stability; *and*

WHEREAS, Ratepayer protections are incorporated in the Pennsylvania approach: the surcharge is limited to a maximum of 5% of the water bill, annual reconciliation audits are conducted where overcollections will be refunded with interest and undercollections will be billed into future rates without interest recovery, the surcharge is reset to zero at the time of the next rate case, the charge is reset to zero if the company is over-earning, customer notice is provided, and all charges reflect used and useful plant; *now, therefore, be it*

RESOLVED, That the Board of Directors of the National Association of Regulatory Utility Commissioners (NARUC), convened at its 1999 Winter Meetings in Washington, D.C, agrees to endorse the mechanism as an example of an innovative regulatory tool that other Public Utility Commissions may consider to solve infrastructure remediation challenges in their States; *now be it further*

RESOLVED, That NARUC agrees to co-sponsor with the National Association of Water Companies the videotape of the Distribution System Improvement Charge as an educational tool to inform other regulatory agencies and legislatures about this promising new mechanism.

Sponsored by the Committee on Water
Adopted February 24, 1999

Exhibit
F

Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"

WHEREAS, A number of innovative regulatory policies and mechanisms have been implemented by public utility commissions throughout the United States which have contributed to the ability of the water industry to effectively meet water quality and infrastructure challenges; *and*

WHEREAS, The capacity of such policies and mechanism to facilitate resolution of these challenges in appropriate circumstances supports identification of such policies and mechanisms as "best practices"; *and*

WHEREAS, During a recent educational dialogue, the "2005 NAWC Water Policy Forum," held among representatives from the water industry, State economic regulators, and State and federal drinking water program administrators, participants discussed (consensus was not sought nor determined) and identified over 30 innovative policies and mechanisms that have been summarized in a report of the Forum to be available on the website of the Committee on Water at www.naruc.org; *and*

WHEREAS, As public utility commissions continue to grapple with finding solutions to meet the myriad water and wastewater industry challenges, the Committee on Water hereby acknowledges the Forum's *Summary Report* as a starting point in a commission's review of available and proven regulatory mechanisms whenever additional regulatory policies and mechanisms are being considered; *and*

WHEREAS, To meet the challenges of the water and wastewater industry which may face a combined capital investment requirement nearing one trillion dollars over a 20-year period, the following policies and mechanisms were identified to help ensure sustainable practices in promoting needed capital investment and cost-effective rates: a) the use of prospectively relevant test years; b) the distribution system improvement charge; c) construction work in progress; d) pass-through adjustments; e) staff-assisted rate cases; f) consolidation to achieve economies of scale; g) acquisition adjustment policies to promote consolidation and elimination of non-viable systems; h) a streamlined rate case process; i) mediation and settlement procedures; j) defined timeframes for rate cases; k) integrated water resource management; l) a fair return on capital investment; *and* m) improved communications with ratepayers and stakeholders; *and*

WHEREAS, Due to the massive capital investment required to meet current and future water quality and infrastructure requirements, adequately adjusting allowed equity returns to recognize industry risk in order to provide a fair return on invested capital was recognized as crucial; *and*

WHEREAS, In light of the possibility that rate increases necessary to remediate aging infrastructure to comply with increasing water quality standards could aversely affect the affordability of water service to some customers, the following were identified as best practices to address these concerns: a) rate case phase-ins; b) innovative payment arrangements; c) allowing the consolidation of rates ("Single Tariff Pricing") of a multi-divisional water utility to spread capital costs over a larger base of customers; *and* d) targeted customer assistance programs; *and*

WHEREAS, Small water company viability issues continue to be a challenge for regulators, drinking water program administrators and the water industry; best practices identified by Forum participants include: a) stakeholder collaboration; b) a memoranda of understanding among relevant

State agencies and health departments; c) condemnation and receivership authority; and d) capacity development planning; *and*

WHEREAS, The U.S. Environmental Protection Agency's "Four-Pillar Approach" was discussed as yet another best practice essential for water and wastewater systems to sustain a robust and sustainable infrastructure to comprehensively ensure safe drinking water and clean wastewater, including: a) better management at the local or facility level; b) full-cost pricing; c) water efficiency or water conservation; *and* d) adopting the watershed approach, all of which economic regulators can help promote; *and*

WHEREAS, State drinking water program administrators emphasized the following mechanisms which Forum participants identified as best practices: a) active and effective security programs; b) interagency coordination to assist with new water quality regulation development and implementation, such as a memorandum of understanding; c) expanded technical assistance for small water systems; d) data system modernization to improve data reliability; e) effective administration and oversight of the Drinking Water State Revolving Fund to maximize infrastructure remediation, along with permitting investor owned water companies access in all States; f) the move from source water assessment to actual protection; *and* g) providing State drinking water programs with adequate resources to carry out their mandates; *now therefore be it*

RESOLVED, That the National Association of Regulatory Utility Commissioners (NARUC), convened in its July 2005 Summer Meetings in Austin, Texas, conceptually supports review and consideration of the innovative regulatory policies and practices identified herein as "best practices;" *and be it further*

RESOLVED, That NARUC recommends that economic regulators consider and adopt as many as appropriate of the regulatory mechanisms identified herein as best practices; *and be it further*

RESOLVED, That the Committee on Water stands ready to assist economic regulators with implementation of any of the best practices set forth within this Resolution.

Sponsored by the Committee on Water
Adopted by the NARUC Board of Directors July 27, 2005

Exhibit
G

PENNSYLVANIA PUBLIC UTILITY COMMISSION
HARRISBURG, PENNSYLVANIA 17105-3265

Petition of Pennsylvania-American Water Company for Approval to Implement a Tariff Supplement...Revising the Distribution Distribution System Improvement Charge

Public Meeting held July 11, 2007
JUL-2007-OSA-0161*
Docket No.: P-00062241, *et al.*

MOTION OF CHAIRMAN WENDELL F. HOLLAND

Before us for consideration is the Petition filed by the Pennsylvania American Water Company for approval to implement a tariff supplement revising the distribution system improvement charge ("DSIC"). The revision being sought is a request to raise the DSIC cap from 5% of billed revenues to 7.5% on DSIC eligible infrastructure.[1] Administrative Law Judge Wayne L. Weismandel issued a Recommended Decision which denied the Petition. I disagree with the Recommended Decision and instead will move to grant Pennsylvania-American's Exceptions which succinctly clarify the Petition's consistency with the purpose of DSIC, along with providing ample support as to the benefits expected to accrue to ratepayers with a 7.5% DSIC cap.

If there were ever a regulatory tool literally created right here in Pennsylvania that is recognized as a best practice around the country it is the DSIC. Its main features are that it is:

- Pro-environmental as it significantly decreases line loss of one of our most precious resources;
- Promotes a major objective of this Administration and this Legislature which is to fix Pennsylvania's aging infrastructure; and
- Promotes economic development as it creates hundreds of jobs.

[1] Revenue neutral projects allowed under DSIC include: main and valve replacement, main cleaning and relining, fire hydrant replacement, main extensions to eliminate dead ends, solutions to regionalization projects and meter change outs.

Background

1. National View

The DSIC mechanism is one of the most important regulatory tools of the past decade. It has been cited by the National Association of Regulatory Utility Commissioners as a "Best Practice"[2] and it has been designated by the Council of State Governments as "Model Legislation."[3] Nationwide, it is common knowledge that infrastructure is deteriorating throughout the country and this dilemma must be addressed in a timely, cost-effective manner.[4] The U.S. Environmental Protection Agency cites a $276.8 billion need to upgrade or replace drinking water infrastructure over the next 20 years.[5] Here in the Commonwealth, the state's portion of drinking water infrastructure needs over 20 years totals $10.8 billion.[6]

Many utilities were built more than a century ago and much of today's plant in service requires expensive upgrading. The unprecedented magnitude of the extent of needed infrastructure upgrades, along with the high cost, call for innovative solutions. Mains that were first placed into the ground a century ago cost approximately $1 a foot. Today, the remediation or replacement costs range from $61 to $100 per foot. Under traditional ratemaking, the pace of remediation ranged from a few hundred years to 900 years, or not in any way nearing a realistic timeframe to match the actual service lives of mains (approximately 75-125 years, with exceptions based on materials and soils). Legislatures in six other states recognized that a new regulatory mechanism was needed to accelerate the pace of infrastructure upgrades at a reasonable cost. DSIC has been a key response toward resolving this challenge.

2. Pennsylvania Perspective

Prior to DSIC's implementation in 1997, Pennsylvania-American's timeframe to upgrade its existing, aging infrastructure was 225 years.[7] Following DSIC's implementation, the timeframe was reduced by nearly 25% to 170 years. A critical factor is that with its current increased investments in DSIC eligible projects over the 5% cap (the most recent[8] quarterly filing reached 6.36%), the Company estimates a 33%

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2 NARUC Board of Directors, "Resolution Supporting Consideration of Regulatory Policies Deemed as Best Practices," July 27, 2005.

3 Council of State Governments, "Suggested State Legislation," 2000 Volume 59, pages 44-45.

4 Innumerable articles have documented this situation, among the most well known is the American Society of Civil Engineers, "Report Card for America's Infrastructure," 2005; water and wastewater infrastructure received grades of "D minus; the grade for American's infrastructure overall was a "D."

5 U.S. Environmental Protection Agency, "Drinking Water Infrastructure Needs Survey and Assessment," 2003.

6 *Ibid.*

7 Other jurisdictional water companies faced similar or worse timeframes.

8 As of January 1, 2007.

reduction to 112 years, which more realistically reflects actual service lives.[9] Matching replacement with service life substantially improves service reliability.

Infrastructure remediation and improved service and service reliability directly benefits customers. Upgrades of deteriorated mains are essential to reduce main breaks, service interruptions and unaccounted for water; and improve water quality, improve pressure, enhance fire protection, and achieve rate stability. Additional ratepayer benefits include these essential goals; DSIC:

- Promoted the acquisition of small and non-viable water systems, consistent with Commission policy (see 52 Pa. Code §§ 69.711 (relating to small and nonviable systems));
- Promoted the regionalization of water systems, consistent with Commission policy (see 52 Pa. Code §69.721 (relating to acquisitions));
- Reduced rate case expense by decreasing the frequency of base rate case filings;
- Allowed water utilities to afford remediation projects that would have otherwise been cost-prohibitive; and
- Decreased main breaks, service interruptions, low pressure problems, and discolored water.[10]

When DSIC's implementation was approved by the Commission, several critical safeguards were established, including a cap of 5% of billed revenues.[11] Additional safeguards include: resetting the DSIC to zero at the time of the next base rate case or if the utility is over-earning; providing notice to customers of any change in the DSIC rate; audits are conducted as needed, and an annual reconciliation audit is conducted to ascertain any over or under-collections, with any over-collections being refunded with interest at the time of the next DSIC calculation. All mains or other DSIC eligible projects have been placed into service prior to DSIC charges being issued to customers and meet used and useful parameters, which are among the foundations of utility ratemaking principles. These safeguards remain untouched by the Company's requested higher cap.

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9 Pennsylvania-American Main Brief, page 9.

10 Aqua Pennsylvania, Inc. Correction to Amicus Curiae Brief, Docket Nos. P-00062241 and P-00062241C-0001, p. 4.

11 Petition of Pennsylvania-American Water Company for Approval to Implement a Tariff Supplement Establishing a Distribution System Improvement Charge, Docket No. P-00961031, Order entered August 16, 1996, see Attachment A, "Sample Tariff Language," p. 4. The Petition was undergoing an appeal in Commonwealth Court when an amendment was enacted by the Legislature to add a section to the Public Utility Code to expressly provide for the allowance of an automatic adjustment charge for infrastructure remediation at 66 Pa. C.S. §1307 (g). The new section of the Statute was signed into law on December 18, 1996.

The Company points out that:

> . . . under the ALJ's criteria, there would not be a need for a DSIC at all, so long as a minimal level of adequate service was being rendered. Fortunately, the General Assembly had a broader vision and has provided the Commission with the tools to replace aging infrastructure in the Commonwealth. PAWC simply requests that the Commission use this tool and permit the Company to increase its DSIC percentage so that the purpose of the law can be realized.[12]

Goal of An Increased Cap

Pennsylvania-American recognized that its ideal spending level for infrastructure remediation "should be adequate to keep pace with the anticipated remaining useful life of the distribution system infrastructure."[13] The Company explained that in 2006 it accelerated its infrastructure upgrade program by over 50% and replaced 82 miles of mains. This can be compared with the pre-DSIC figure of replacing 25 miles per year. From DSIC's inception in1997 until 2005, the Company replaced 47 miles of main, or 0.56%. The 2006 increased rate of 0.90% has been maintained in 2007 at a DSIC level of 6.36% for all of 2007, although it is only allowed to collect at 5%. As previously stated, the current accelerated ratê should enable the Company to significantly reduce by 34% the amount of time it would take to make all of the needed improvements, from approximately170 years to 112 years.[14]

The Company also noted its current focus on replacing smaller diameter mains due to its discovery that they were found to be a more frequent source of main breaks than larger diameter mains.[15] The Company states that an increased DSIC cap to 7.5% will support its efforts to accelerate the systematic replacement of its older small diameter mains. The company estimates it can reduce by about 20 years the time in which it will be able to make the needed improvements to this segment of its distribution system. The Company points out that in comparison, "an under-funded DSIC is more likely to result in more significant costs associated with unplanned or more extensive system repairs in the future (e.g., more main breaks and service interruptions, higher levels of unaccounted for water, etc.).[16]

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12 Pennsylvania-American Water Company Exceptions, Docket No. P-00062241, p. 11.

13 Pennsylvania-American Water Company Main Brief, p. 9.

14 *Ibid.*, pp. 8-9.

15 *Ibid.*, p. 11.

16 *Ibid.*, p. 12.

The Company has determined that a higher investment level is essential for it to keep pace with the anticipated remaining useful life of the distribution system infrastructure.[17] In fact, the Company summarizes the evidence presented in the instant case as revealing a choice between:

> . . . (1) providing the Company with adequate resources (a 7.5% DSIC cap) to support a three-year or more base rate case filing cycle, or (2) providing the Company with more limited resources (a 5% DSIC cap) that would encourage a more frequent base rate case cycle – every year or two.[18]

The Company summarizes further that:

> . . . the current DSIC cap of 5% will still be inadequate to provide the Company with resources adequate to achieve the Commission's long term objective – to accelerate the replacement of PAWC's efforts to accelerate its distribution system improvement program and encouraging the Company to make reasonable frequent base rate case filings.[19]

A higher DSIC rate today is consistent with the legislative intent to economically accelerate infrastructure remediation:

> The DSIC more accurately reflects the ongoing investments and improvements that are made in the water distribution system versus the less frequent but larger step increases that would result from base rate increases without an appropriately funded DSIC. The timely recovery of the fixed costs of infrastructure replacement through the DSIC provides an incentive for increased and continued levels of capital infusion. This results in a stronger and more reliable water distribution system for both current and future customers.[20]

Moreover, I note that Pennsylvania-American's customers' rates at the 5% DSIC rate average $1.75 a month. With a 7.5% DSIC, that rate will increase by $1.00 a month. It should be kept in mind that this rate will be reset to zero following the next base rate case (or at any time that the Company is over-earning) and it takes a number of billing cycles of progressive increases over a few years to rise to the allowed level of the cap.

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17 *Ibid.*, p. 9

18 Pennsylvania-American Exceptions, p. 12.

19 *Ibid.*

20 Pennsylvania-American Main Brief, p. 13.

Most importantly, DSIC represents a dollar-for-dollar recovery of prudent expenses incurred for improving reliability to customers.

In addition, a response is necessary to the argument put forth by the Office of Consumer Advocate ("OCA") that simple presentation of expenses virtually guarantees recovery.[21] Expense recovery is granted only for those DSIC eligible projects that are prudently incurred, in service and used and useful. In raising the level of DSIC expense recovery, we clearly intend to continue its cautious use. Contrary to the OCA's reference to the reasoning of the Commonwealth Court in the recent Collection System Improvement Charge Appeal,[22] the DSIC review and audit process includes a determination of compliance and prudency. Hence, the Court's reference to recovery of projects being relatively automatic (using the example of a solid gold manhole cover being allowed, provided the expense was made and submitted) is simply not accurate nor reflective of the extensive and thorough DSIC review process.

Finally, I am mindful of the value of DSIC: "its success cannot be denied. It is now time to improve upon that success by allowing an incremental increase in the cap."[23] I wholeheartedly agree.

THEREFORE, I MOVE:

1. That the Recommended Decision of Administrative Law Judge Wayne L. Weismandel is rejected, consistent with this Motion;

2. That the Exceptions of the Pennsylvania-American Water Company are granted;

3. That the Petition of Pennsylvania-American Water Company to implement a tariff supplement revising the distribution system improvement charge is granted.

4. That the Office of Special Assistants shall prepare the appropriate order consistent with this Motion.

______________	______________________________
DATE	**WENDELL F. HOLLAND, CHAIRMAN**

21 Office of Consumer Advocate Main Brief, p. 12.

22 *Popowsky v. Pa. PUC,* 869 A.2d 1144, 1156 (2005).

23 Aqua Pennsylvania Amicus Curiae Brief, p. 3.

Exhibit
H

ARIZONA WATER COMPANY

Docket No. W-01445A-10-XXXX
DSIC Revenue Requirement
As of December 31, 2009

Line No.		[A] Pinal Valley	[B]	[C]	[D]
1	TEST YEAR DATA				
2					
3	Eligible DSIC Plant in Service	$ 2,500,000			
4	Accumulated Depreciation	-			
5	(Sch. 8, p. 1)				
6	Eligible DSIC Plant Rate Base	$ 2,500,000			
7	Required Rate of Return	9.52%			
8	(Proposed)				
9	Required Operating Income	$ 238,000			
10	(Ln. 6 x Ln. 7)				
11	Revenue Conversion Factor	1.6556			
12	(Decision No. 71845)				
13	Revenue Requirement - Return on Eligible DSIC Plant	$ 394,033			
14	(Ln. 9 x Ln. 11)				
15					
16	Depreciation on Eligible DSIC Plant	$ 45,248			
17	(Sch. 8, p. 1)				
18					
19	Total Revenue Requirement	$ 439,281			
20	(Ln. 13 + Ln. 16)				
21					
22	Total Operating Revenue	16,574,910			
23					
24	Maximum increase cap	7.5%			
25					
26	Total Operating Revenue Limited by cap	$ 1,243,118			
27	(Ln. 22 X Ln. 24)				
28					
29	Total Revenue Requirement lesser of L 19 or 26	$ 439,281			
30					
31					
32			PINAL VALLEY (CASA GRANDE/COOLIDGE)		
33			Current		
34			Rates	Proposed Rates	
35					
36			Decision No.		Total
37	5/8 X 3/4-INCH RESIDENTIAL METER		71845	DSIC	[B + C]
38	Basic Service Charge				
39	Commodity Rate (Per M Gallon)		$ 15.79	$ 0.61	$ 16.40
40	0 - 3,000 Gallons				
41	3,001 - 10,000 Gallons		$ 1.3700	$ 0.0427	1.4127
42	Over 10,000 Gallons		$ 1.7123	$ 0.0427	1.7550
43			$ 2.1406	$ 0.0427	2.1833
44					
45					
46			PINAL VALLEY (STANFIELD)		
47			Current		
48			Rates	Proposed Rates	
49					
50			Decision No.		Total
51	5/8 X 3/4-INCH RESIDENTIAL METER		71845	DSIC	[B + C]
52	Basic Service Charge				
53	Commodity Rate (Per M Gallon)		$ 15.79	$ 0.61	$ 16.40
54	0 - 3,000 Gallons				
55	3,001 - 10,000 Gallons		$ 2.4379	$ 0.0427	2.4806
56	Over 10,000 Gallons		$ 3.0476	$ 0.0427	3.0903
57			$ 3.8097	$ 0.0427	3.8524
58					
59	Average Residential Bill (5/8 x 3/4 meter) - Casa Grande / Cooldige (9,062 gallons of usage)				
60			$ 30.28	$ 0.99	$ 31.27
61	Average Residential Bill (5/8 x 3/4 meter) - Stanfield (9,062 gallons of usage)				
62			$ 41.58	$ 0.99	$ 42.57
63					

Exhibit
I

ITT

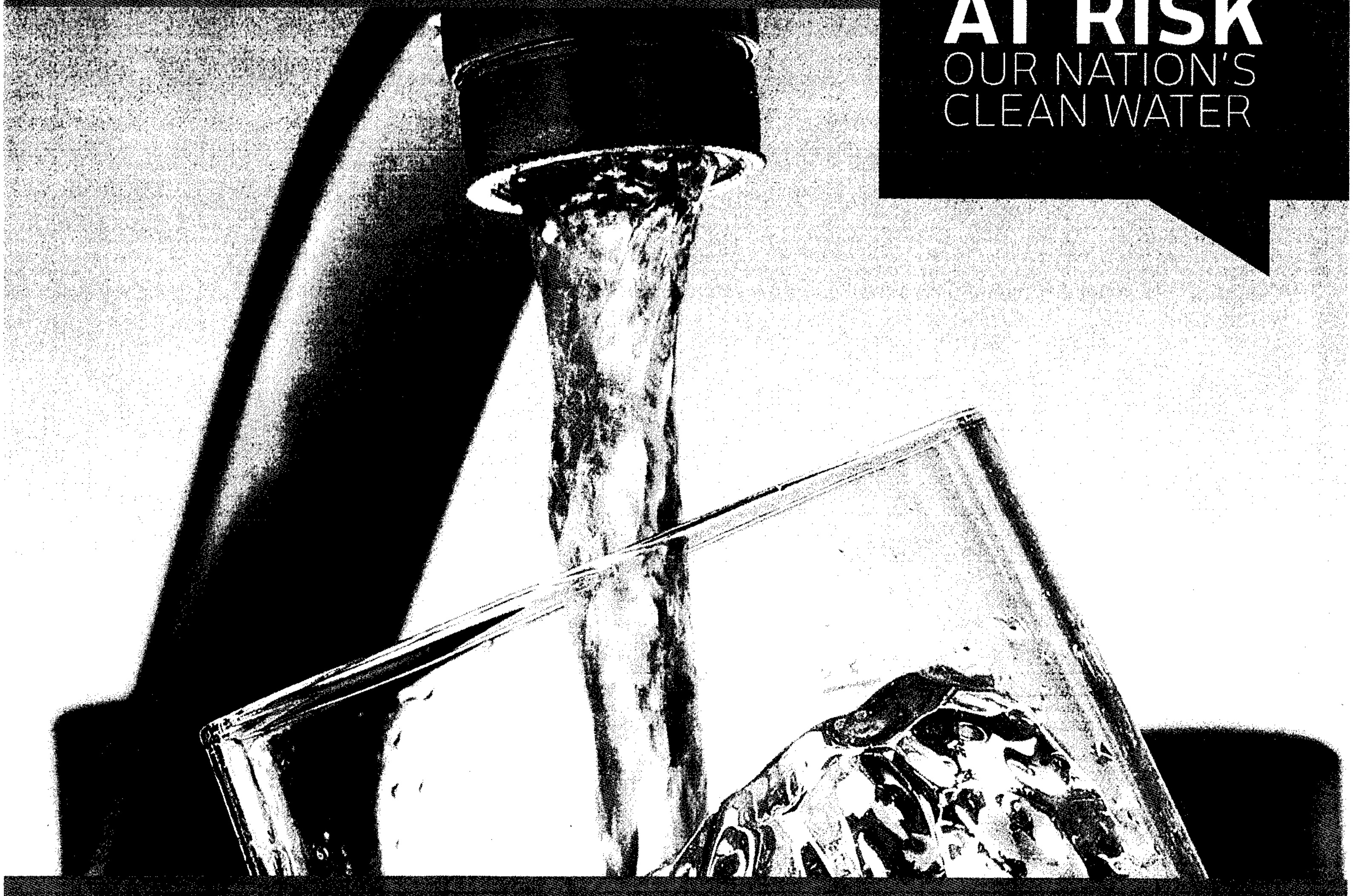
VALUE OF WATER SURVEY

AMERICANS ON THE U.S. WATER CRISIS

650
WATER MAIN BREAKS PER DAY

$2.6
BILLION IN LOST WATER EVERY YEAR

AT RISK
OUR NATION'S CLEAN WATER



EXECUTIVE SUMMARY

95% of American voters value water over any other service they receive, including heat and electricity

Our nation's industrial and agricultural businesses—among the heaviest water users—rank it second, after only electricity

About three out of four American voters and businesses* say disruptions in the water system would have direct and personal consequences

Too many take clean water for granted: 69% of voters, 72% of businesses*

When asked, U.S. voters and businesses* do express concern about our nation's water.

- Nearly one in four American voters is "very concerned" about the state of the nation's water infrastructure
- 29% percent of voters agree that water pipes and systems in America are crumbling and approaching a state of crisis
- 80% of voters say water infrastructure needs reform; about 40% say major reform

*INDUSTRIAL AND AGRICULTURAL BUSINESSES ONLY

EXECUTIVE SUMMARY

People understand that fixing our nation's water infrastructure problems is a shared responsibility:

- 85% of voters, 83% of businesses* agree federal, state and local governments should invest money in upgrading our water pipes and systems
- 79% of voters, 75% of businesses* agree and think government officials need to spend more time addressing water issues
- Both citizens and businesses* understand and accept responsibility
- 63% of American voters, and 57% of businesses* say they are willing to pay a little more each month to upgrade our water system

People everywhere are willing to pay more, regardless of region, residence, gender, age or political affiliation

- Voters are willing to pay on average $6.20 more per month
- If we took them up on their offer, the United States could invest about $5.4 billion more per year in our nation's water infrastructure**
- This is more than four times the FY09 federal investment in our nation's drinking water systems

*INDUSTRIAL AND AGRICULTURAL BUSINESSES ONLY
**BASED ON 2010 CENSUS U.S. BUREAU PROJECTIONS: 114,200,000 U.S. HOUSEHOLDS

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

W-01445A-10-0517

2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

OF

Joel M. Reiker

TABLE OF CONTENTS

APPENDIX AND EXHIBITS

ARIZONA WATER COMPANY

Direct Testimony of

Joel M. Reiker

I. <u>**Introduction and Qualifications**</u>

Q. PLEASE STATE YOUR NAME, EMPLOYER, AND OCCUPATION.

A. My name is Joel M. Reiker. I am employed by Arizona Water Company (the "Company") as Manager of Rates and Regulatory Accounting. In this role, my responsibilities include the preparation and support of regulatory filings related to the Company's rates and charges for service.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. In 1998, I graduated from the Arizona State University School of Management, receiving a Bachelor of Science degree in global business with a specialization in financial management. I have since attended various educational programs and classes on public utility and regulatory issues, including the National Association of Regulatory Utility Commissioners ("NARUC") and the Institute of Public Utilities' Regulatory Studies program at Michigan State University. From 1999 to 2005, I was employed by the Arizona Corporation Commission ("Commission") as a Staff Rate Analyst in the Utilities Division. During my employment with the Commission, my responsibilities included providing recommendations on behalf of Staff regarding rate of return, mergers and acquisitions, divestitures, financings, affiliated interests issues, and I occasionally acted as arbitrator in disputes brought before the Utilities Division. Subsequent to my employment with the Commission, I was employed by the American Water Works Service Company ("American Water") as Senior Regulatory Analyst. My responsibilities with American Water included the preparation and support of regulatory filings, including rate cases, on behalf of utility subsidiaries in the states of Arizona, California, New Mexico and Hawaii. In 2007, I joined the Company in my current position as Manager of Rates and Regulatory Accounting. I am a member of the American Water Works Association ("AWWA") and the Society of Utility and Regulatory Financial Analysts ("SURFA"), and I am a SURFA Certified Rate of Return Analyst. Appendix A contains a listing of my relevant regulatory experience.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE COMMISSION?

A. Yes. I have testified before the Commission in cases involving rates, mergers and acquisitions, financings, complaints, and the affiliated interests rules. I have also testified in California before the California Public Utilities Commission on issues regarding rate of return, risk and revenue decoupling, and I have prepared pre-filed testimony addressing marginal cost-based special contracts with the New Mexico Public Regulation Commission.

II. <u>Purpose and Scope of Testimony</u>

Q. WHAT IS THE SCOPE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I address several issues and specific adjustments in this general rate case application, including the development of rate base, working capital requirement, and net operating income for the Company's Western Group for the historical twelve month period ending December 31, 2009 ("Test Year"). I also sponsor the calculation of the associated increase in gross revenue requirement, as well as the Company's cost of service study and proposed rate design for each system in the Western Group.

Q. DOES YOUR TESTIMONY IN THIS PROCEEDING INCORPORATE THE RECOMMENDATIONS OF OTHER COMPANY WITNESSES?

A. Yes. My testimony in this proceeding incorporates recommendations sponsored in the direct testimonies of William M. Garfield, Joseph D. Harris, Fredrick K. Schneider and Thomas M. Zepp.

Q. WHICH OF THE COMPANY'S SYSTEMS ARE INCLUDED IN THIS GENERAL RATE CASE APPLICATION?

A. This application includes all of the Company's water systems located in its Western Group. The Company's Western Group includes the Pinal Valley, White Tank, and Ajo water systems.

The Pinal Valley water system was formed as a result of consolidating the water systems formerly known as Casa Grande, Coolidge, and Stanfield. Decision No. 71845, dated August 24, 2010 ("Decision 71845") approved the phased consolidation of these systems, under which the accounting records for Casa Grande, Coolidge and Stanfield were fully consolidated into Pinal Valley.

Q. WERE THE GENERAL SERVICE RATES FOR CASA GRANDE, COOLIDGE, AND STANFIELD FULLY CONSOLIDATED IN *DECISION 71845*?

A. No. Decision 71845 fully consolidated the fixed basic service charges of all three systems, but only the commodity rates, tariffs, and billing records for Casa Grande and Coolidge were fully consolidated. The Stanfield water system retained separate commodity rates, which were to be fully consolidated into Pinal Valley in a future rate proceeding. As more fully discussed by Mr. Harris, in this proceeding the Company proposes to bring the commodity rates for the Stanfield water system one step closer to those of Pinal Valley, consistent with the Company's consolidation study filed in Docket No. 08-0440 and attached to Mr. Harris' direct testimony.

Q. PLEASE IDENTIFY THE EXHIBITS AND ASSOCIATED SCHEDULES YOU ARE SPONSORING.

A. I sponsor the rate case exhibits and schedules marked A through C and E through H accompanying the Company's application in this proceeding, while Mr. Harris sponsors the D Schedules. These schedules constitute all of the information required from Class A utilities pursuant to Arizona Administrative Code ("A.A.C.") R14-2-103.B. I also sponsor Exhibits JMR-1 through JMR-6 attached to this pre-filed testimony.

Q. MR. REIKER, WERE THESE EXHIBITS PREPARED BY YOU OR UNDER YOUR DIRECTION AND SUPERVISION?

A. Yes, they were.

Q. DID THE COMPANY FILE THE ADDITIONAL INFORMATION REQUIRED FOR CLASS A, B AND C UTILITIES PURSUANT TO A.A.C. R14-2-103.B.5?

A. Yes. These additional filing requirements are included as Attachment A to the Company's application.

III. <u>Central Arizona Project ("CAP") Hook-Up Fee</u>

Q. WHAT IS THE CAP HOOK-UP FEE?

A. The CAP hook-up fee was approved in Decision No. 68302 (November 14, 2005), and remains in effect for the Company's Pinal Valley (Casa Grande and Coolidge) and White Tank water systems for the purpose of recovering ongoing and deferred CAP Municipal and Industrial ("M&I") capital costs.

Q. DID THE COMMISSION REEVALUATE THE CAP HOOK-UP FEES IN DOCKET NO. 08-0440?

A. Yes. The Company provided a true-up of the CAP hook-up fees in Docket No. 08-0440 which showed that as of December 31, 2007, the amount of deferred CAP M&I capital charges recovered via the CAP hook-up fees was in line with projections and the Company requested that the fees be kept in place for review in the next rate .proceeding. Staff agreed with the Company's request, and recommended that the Company's CAP hook-up fees be reviewed in its next Western Group rate case, or by December 31, 2012.[1] In Decision 71845, the Commission authorized the Company to continue collecting the CAP hook-up fees until its next Western Group rate case, or December 31, 2012, whichever comes first.[2]

Q. IS THE COMPANY PROVIDING ANOTHER TRUE-UP OF THE CAP HOOK-UP FEES IN THIS PROCEEDING?

A. Yes. In order to facilitate the Commission's review of the CAP hook-up fees in this proceeding, the Company has prepared a true-up of the fees for the Pinal Valley and White Tank systems through the end of the Test Year. These schedules are attached hereto as Exhibits JMR-1 (Casa Grande), JMR-2 (Coolidge), and JMR-3 (White Tank). Page one, column G, line 37 of the respective Exhibits shows the balance of deferred CAP M&I capital charges as of December 31, 2009. As of that date, the Company had yet to recover $4,651,683 in previously deferred CAP M&I capital charges in the Pinal Valley and White Tank water systems via the CAP hook-up fees. The Company expects this balance to increase over the coming years, as actual customer growth has been, and is expected to continue to be, significantly below the levels assumed in the projections upon which the CAP hook-up fees are based.

Q. IS THE COMPANY REQUESTING COMMISSION AUTHORITY TO CONTINUE COLLECTING THE CAP HOOK-UP FEES IN THE PINAL VALLEY AND WHITE TANK WATER SYSTEMS?

A. Yes. However, the Company is requesting that the present CAP hook-up fees be consolidated into a single fee of $204 for a ⅝- by ¾-inch meter (scaled higher for

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[1]See Igwe direct testimony, p. 29 at 5-9, Docket No. 08-0440.
[2]See Decision No. 71845, p. 92 at 24-26.

larger meter sizes) in the Pinal Valley and White Tank systems. As discussed by Mr. Harris in his direct testimony and in Section IV below, the Company is requesting a phased consolidation of the Pinal Valley and White Tank systems in this proceeding. Under the Company's consolidation proposal, the general service rates of the Pinal Valley and White Tank water systems will ultimately be consolidated. Consistent with this approach, the CAP hook-up fees for these systems should be consolidated into a single CAP hook-up fee at this time.

Q. HOW DID YOU ARRIVE AT A CONSOLIDATED CAP HOOK-UP FEE OF $204 FOR THE CONSOLIDATED PINAL VALLEY AND WHITE TANK WATER SYSTEMS?

A. The consolidated CAP hook-up fee of $204 in the Pinal Valley and White tank water systems is based upon the original customer growth projections and assumed CAP hook-up fee collections for the years 2006 through 2025, attached to Decision No. 68302. The Company is not requesting authority to increase or decrease the CAP hook-up fees. Rather, the Company is only requesting authority to consolidate the CAP hook-up fees. Exhibit JMR-4, page 1, column H, line 41 shows the calculation of the consolidated fee for a ⅝- by ¾-inch meter. Lines 46 – 53 of the same column show the consolidated fees at increasing meter sizes, which are based upon the current CAP hook-up fee multiples in Casa Grande.

Q. WHY IS THE COMPANY NOT REQUESTING AUTHORITY TO INCREASE OR DECREASE THE CAP HOOK-UP FEES?

A. Although the Company expects the balance of deferred CAP M&I capital charges to increase in the near-term, the Commission will have an opportunity to review the CAP hook-up fees again in the next Western Group rate case which, other things equal, the Company expects to file in 2013 with a 2012 Test Year. Additionally, the Company believes that any adjustment to the CAP hook-up fees should only take place after the affected service areas have experienced a more normalized level of customer growth compared to recent levels, thus allowing for a more useful evaluation.

IV. Summary of Revenue Requirement

Q. PLEASE EXPLAIN SCHEDULE A-1.

A. Schedule A-1 to the application is titled "Computation of Increase in Gross Revenue Requirement." The increase in gross revenues for each system in the Western Group represents the change in gross revenues that the Company has determined is necessary to recover the cost, including the cost of capital, of providing safe, reliable and adequate service to its customers. Page 1 of Schedule A-1 includes a summary for the Western Group. As shown on line 23 of page 1, the total required increase in gross revenues for the Western Group based on the historical Test Year ended December 31, 2009 is $5,097,223, or 26.75 percent over current base rates.

Q. WHAT IS THE CONSOLIDATED REVENUE ADJUSTMENT SHOWN ON LINE 21 OF SCHEDULE A-1?

A. The consolidated revenue adjustment represents the increase/(decrease) in the revenue requirement of each system resulting from the Company's proposed rate design. In systems where the Company is proposing rate consolidation, the adjustment will be positive or negative. The total (net) consolidated revenue adjustment for the Western Group is zero. As shown on Schedules A through H, the Company has provided revenue requirement data for each of the water systems included in this filing as they currently exist. As explained by Mr. Harris in his testimony, the Company is proposing a phased consolidation of the Pinal Valley and White Tank water systems, under which both systems will have common residential and commercial rates and, while retaining different general service rates for industrial customers. Under this approach, the financial and operating data of the White Tank and Pinal Valley water systems will be fully consolidated, while tariffs and billing records will remain separate until industrial general service rates are fully consolidated in a future rate proceeding. I will address rate consolidation further in Section VII of this testimony.

V. Rate Base and Rate Base Adjustments

A. Rate Base

Q. HOW DID YOU ARRIVE AT THE TEST YEAR ORIGINAL COST RATE BASE SHOWN ON SCHEDULE B-1, LINE 23?

A. The original cost rate base was calculated by establishing the balance of utility plant in service at the end of the Test Year, per the Company's books, as shown in column A, lines 3 – 9 of Schedule B-2. Typical rate base deductions (accumulated depreciation, advances for construction, etc.) and additions (working capital, etc.) were then calculated to arrive at the actual end-of-Test Year rate base shown in column A, line 30 of Schedule B-2. Finally, the Company made various pro forma adjustments (columns B through J of Schedule B-2) to the actual end-of-Test Year rate base to arrive at the adjusted end-of-Test Year rate base shown in column L of Schedule B-2. As shown in column L, line 30 of Schedule B-2, and summarized on Schedule B-1, the Western Group's total adjusted end-of-Test Year rate base is $57,714,878. The Company's original cost rate base is used as its fair value rate base for the purposes of this proceeding.

Q. HOW DID YOU ESTIMATE THE WORKING CASH COMPONENT OF WORKING CAPITAL SHOWN ON SCHEDULE B-5, LINE 3?

A. The working cash component of required working capital was estimated using the "lead/lag study" methodology. A lead/lag study examines the net lag days between: (1) the time lag between services rendered and the receipt of revenues for such services and (2) the time lag between the recording of costs and the payment of such costs. The lead/lag study submitted by the Company in its recently concluded 2007 Test Year rate case (Docket No. 08-0440) was used as a starting point to estimate the working cash requirement in this case. Minor adjustments were made to reflect the actual number of Test Year revenue lag days for each system as well as the number of purchased water lag days in the White Tank system.[3]

Q. PLEASE RECONCILE THE REMAINING WORKING CAPITAL COMPONENTS LISTED ON LINES 5 – 9 OF SCHEDULE B-5 WITH THE COMPANY'S COMPARATIVE BALANCE SHEET SHOWN ON SCHEDULE E-1.

A. The amount of materials and supplies inventories, required bank balances, and prepayments included in the required working capital allowance shown on Schedule B-5 represent a thirteen-month average, whereas the balance sheet shown on Schedule E-1 represents a single point in time. A thirteen-month average balance of the aforementioned working capital components eliminates daily fluctuations and more accurately reflects ongoing balances.

B. <u>Rate Base Adjustments</u>

Q. PLEASE EXPLAIN RATE BASE ADJUSTMENT RB-1 – ADJUST RATE BASE TO INCLUDE POST-TEST YEAR PLANT.

A. Rate base adjustment RB-1, detailed on pages 1 – 5 of the Appendix to Schedule B-2, increases the end-of-Test Year balance of utility plant and accumulated depreciation to reflect revenue-neutral utility plant additions placed into service after the end of the Test Year. Revenue-neutral utility plant includes only those items required for the provision of service to customers during the Test Year.

Rate base adjustment RB-1 increases the Western Group's gross utility plant in service by $2,829,809, and increases accumulated depreciation by

[3]The adjusted Test Year operating expenses in Docket No. 08-0440 did not include purchased water expense for the White Tank system. Thus, it was necessary to calculate the number of purchased water lag days for the Test Year in this case.

$48,948. This adjustment assumes that these items were placed into service on December 31, 2009, and assumes for ratemaking purposes that the Company recorded a half-year of depreciation on these additions, consistent with standard utility plant accounting practices.

Q. PLEASE EXPLAIN RATE BASE ADJUSTMENT RB-2 – AMORTIZE REGULATORY ASSETS AND LIABILITIES APPROVED IN PRIOR RATE CASES.

A. Rate base adjustment RB-2, detailed on page 6 of the Appendix to Schedule B-2, is the adjustment necessary to amortize regulatory assets approved in Decision Nos. 68302 and 71845, the two most recent rate cases for the Western Group. Rate base adjustment RB-2 amortizes these items through the end of the Test Year, resulting in a net regulatory asset of $502,505 in the Pinal Valley system. This regulatory asset represents previously deferred CAP M&I capital charges that were deemed used and useful by the Commission in prior rate proceedings.

Q. PLEASE EXPLAIN RATE BASE ADJUSTMENT RB-3 – ALLOCATE PHOENIX OFFICE AND METER SHOP RATE BASE.

A. Rate base adjustment RB-3, detailed on page 7 of the Appendix to Schedule B-2, is the adjustment necessary to allocate rate base items related to the Phoenix office and meter shop to each system, consistent with previously approved allocation methods. Phoenix office and meter shop net rate base is allocated using a three-factor formula. The three-factor formula is based on the ratios of each system's number of customers, gross plant less intangibles, and payroll, to total-company customers, gross plant less intangibles, and payroll.

VI. Income Statement

A. Test Year Revenues and Revenue-Based Adjustments

Q. DID YOU VERIFY AND PROVE THE TEST YEAR REVENUES?

A. Yes. Schedule H-5 shows the Company's bill count. The bill count lists the number of bills by thousand-gallon block and the cumulative consumption by rate block for each rate schedule. The bill count was prepared using the methodology described in Appendix C of the AWWA's Manual of Water Supply Practices M1, and it is presented in a format consistent with A.A.C. R14-2-103 (Appendix), as well as prior rate case filings by the Company.

As shown on page 1 of Schedule H-2, column E, line 46, the Western Group's total billed water revenues during the Test Year were $18,285,701, compared to total adjusted general ledger ("GL") water revenues of $18,285,606, shown on page 1 of Schedule H-2, column K, line 46. The unreconciled difference of $95 ($18,285,701 - $18,285,606) represents 0.00 percent of adjusted GL water revenues. Revenues for each of the Western Group water systems are reconciled to within ±0.15 percent of adjusted GL water revenues on the remaining pages of Schedule H-2.[4]

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-1 – REMOVE SALES TAXES FROM REVENUES AND EXPENSES.

A. Income statement adjustment IS-1, detailed on page 1 of the Appendix to Schedule C-2, is a pro forma adjustment to remove revenue-based taxes from operating revenues and expenses. The purpose of the adjustment is to segregate revenues billed pursuant to the Company's tariffs, which exclude sales taxes and regulatory assessments, from total operating revenues, which include sales taxes and regulatory assessments. Because the Company's tariff rate for coin machine service includes sales tax, sales taxes on coin machine revenues were not removed. Income statement adjustment IS-1 reduces revenues and expenses by

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[4]A correlation of bill count revenue to actual billed revenue of 3 percent or less generally indicates that the bill tabulation is sufficiently accurate for rate-design purposes. See AWWA M1 Manual, p. 315.

$1,750,131 in the Western Group, and has no effect on the Company's adjusted Test Year operating income.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-2 – ELIMINATE NET UNBILLED REVENUES AND EXPENSES.

A. Income statement adjustment IS-2, detailed on page 2 of the Appendix to Schedule C-2, removes the effect of the year-end accounting requirement to accrue revenues earned but not yet billed and expenses incurred but not yet invoiced. In January of each year, the prior year's unbilled revenue and expense accounting adjustments recorded in December are reversed. In December of each year, the revenues earned but not yet billed to customers and expenses incurred but not yet invoiced by suppliers are quantified and recorded as a year-end accounting adjustment. The net effect of the January and December accounting adjustments are removed from the adjusted operating income by including this pro forma adjustment. This adjustment reduces Test Year revenues and expenses by $81,477 and $11,637, respectively.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-3 – ELIMINATE MONITORING ASSISTANCE PROGRAM ("MAP") REVENUES AND EXPENSES.

A. Income statement adjustment IS-3, detailed on page 3 of the Appendix to Schedule C-2, removes the surcharge revenues and Test Year expenses associated with the Arizona Department of Environmental Quality's ("ADEQ") MAP. The MAP initially provided the required testing for three categories of constituents: inorganic, synthetic organic chemicals, and volatile organic chemicals. In addition to these constituents, the program now includes testing for asbestos, radionuclides, nitrite, and nitrate.

For each system that is required to participate in the MAP, the Company must pay an annual fee to the ADEQ based on a formula in that agency's regulations covering the normal testing requirements. Pursuant to the Company's MAP Surcharge Tariff, MA-262, a filing is made with the Director of the Utilities Division in October of each year to establish the surcharge to be effective beginning the following January. The MAP surcharge revenues of $5,419 collected in 2009 and the MAP expenses of $21,799, recorded in 2009 for the Western Group, should be removed from the Test Year operating income to determine new base rates in this proceeding.

Q. WHAT ARE THE ADVANTAGES OF RETAINING THIS METHOD OF DEALING WITH MAP COSTS?

A. There are several benefits to retaining the procedure as currently designed. First, because the testing costs are outside the control of the Company and set by another State agency independent of the Commission, it is beneficial to inform customers on their bills that participation in MAP testing is required by the ADEQ and not the Commission. Additionally, the MAP surcharge procedure provides a direct benefit to customers when MAP program cost reductions realized in the past are passed on to customers by way of a reduced MAP surcharge, or a water system's requirement to participate in the MAP is eliminated altogether as a result of customer growth.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-4 – ELIMINATE ARSENIC COST RECOVERY MECHANISM ("ACRM") REVENUES.

A. Income statement adjustment IS-4, detailed on page 4 of the Appendix to Schedule C-2, removes the Test Year surcharge revenues collected pursuant to the Company's ACRM. In the Test Year, the Company had ACRMs approved for its Pinal Valley and White Tank water systems in the Western Group. This adjustment reduces revenues by $2,032,454, reflecting the recovery of capital costs (return and depreciation) and certain qualifying operating expenses related to arsenic treatment facilities. Because the capital and operating costs associated with these facilities are reflected in the adjusted Test Year operating income, the Test Year revenue collected pursuant to the ACRM should be removed.

Q. IS THE COMPANY REQUESTING AUTHORITY TO FILE ADDITIONAL ACRMS IN THE FUTURE?

A. Yes. As explained by Mr. Harris and Mr. Schneider, the Company must design and construct additional arsenic treatment facilities in the Pinal Valley system. Without the continued authority to implement surcharges under the ACRM, the capital and operating costs related to these federally-mandated projects will go unrecovered for an extended period of time. It is for this reason that the Company requests authority in this docket to file additional ACRM surcharges, to be "trued-up" in a future rate proceeding.

Q. DID THE COMMISSION AUTHORIZE THE COMPANY TO FILE FOR ADDITIONAL ACRM SURCHARGES IN DECISION 71845?

A. Yes. In Decision 71845, the Commission recognized the ACRM's usefulness in providing the Company an opportunity to recover certain types of discrete cost increases associated with major plant investment, and authorized the Company to file for additional ACRM surcharges in the Sedona and Superstition systems.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-5 – ANNUALIZE REVENUES AND EXPENSES TO REFLECT END-OF-TEST YEAR CUSTOMERS.

A. Income statement adjustment IS-5, detailed on pages 5 – 10 of the Appendix to Schedule C-2, is the adjustment necessary to match revenues and expenses with end-of-Test Year rate base. This is accomplished by adjusting revenues and expenses to reflect the number of customers served by the Company on December 31, 2009, the last day of the Test Year. The adjustment to revenues of $63,420 in the Western Group is the difference between the revenues generated by the Test Year 2009 bill count, shown on Schedule H-5, and revenues generated by a bill count reflecting the number of customers actually served on December 31, 2009.

The additional $19,330 in expenses for source of supply, pumping, and water treatment were calculated by multiplying (1) the difference between (i) the number of gallons sold per the Test Year bill count, and (ii) the number of gallons sold per a bill count reflecting the number of customers served on December 31, 2009, by (2) the average costs shown on lines 30–32 of Schedule E-7.

The additional $27,517 in transmission and distribution, customer accounting, and administrative and general expenses was calculated by multiplying (1) the difference between (i) the number of customers reflected in the Test Year bill count and, (ii) a bill count reflecting the number of residential and commercial customers served on December 31, 2009, by (2) the average costs shown on lines 35–37 of Schedule E-7.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-6 – ADJUST REVENUES TO REFLECT NEW RATES EFFECTIVE JULY 1, 2010.

A. Income statement adjustment IS-6, detailed on pages 11-16 of the Appendix to Schedule C-2, adjusts revenues to reflect the rates recently approved for the Company (including the Western Group) in Decision 71845. This adjustment to annualize those new rates increases Test Year revenues in the Western Group by $4,165,876.

B. <u>Expense-Based Adjustments</u>

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-7 – ANNUALIZE PAYROLL EXPENSE.

A. Income statement adjustment IS-7, detailed on page 17 of the Appendix to Schedule C-2, increases payroll expense to reflect known and measurable increases to hourly pay rates. This adjustment is intended to recognize currently known and measurable pay rates as though they were in effect from the beginning of the Test Year. The adjustment to annualize payroll expense is $199,824 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-8 – ANNUALIZE PAYROLL TAXES.

A. Income statement adjustment IS-8, detailed on page 18 of the Appendix to Schedule C-2, adjusts payroll-related taxes to correspond to the pro forma payroll expense annualized in income statement adjustment IS-7. The adjustment to annualize payroll taxes is $18,932 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-9 – ANNUALIZE 401(K) EXPENSE.

A. Income statement adjustment IS-9, detailed on page 19 of the Appendix to Schedule C-2, adjusts the Company's 401(k) expense to incorporate the pro forma payroll expense annualized in income statement adjustment IS-7. The adjustment to annualize 401(k) expense is $49,700 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-10 – ADJUST INSURANCE EXPENSE.

A. Income statement adjustment IS-10, detailed on page 20 of the Appendix to Schedule C-2, adjusts medical, dental, long-term disability, life, and property and liability insurance expenses to reflect the most recent premiums in effect. The adjustment to annualize these expenses is $152,427 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-11 – ADJUST ADMINISTRATIVE & GENERAL ("A&G") EXPENSE TO INCLUDE CUSTOMER DEPOSIT INTEREST EXPENSE.

A. Income statement adjustment IS-11, detailed on page 21 of the Appendix to Schedule C-2, is the pro forma adjustment necessary to recover interest expense related to customer deposits, as required by A.A.C. R14-2-403.B.3. Because customer deposits are deducted from the rate base, the interest expense related to such deposits will go unrecovered absent an adjustment to include this component of the cost of service as an operating expense. This adjustment increases operating expenses by $20,697 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-12 – NORMALIZE PUMPING AND TRANSMISSION & DISTRIBUTION ("T&D") MAINTENANCE EXPENSE.

A. Income statement adjustment IS-12, detailed on page 22 of the Appendix to Schedule C-2, is the pro forma adjustment necessary to reflect a normalized level of pumping and T&D maintenance expense. Pumping maintenance expenses include costs incurred by the Company for the purpose of maintaining pumping structures and equipment. T&D maintenance expenses include costs incurred by the Company for the purpose of maintaining tanks, mains, services, meters and hydrants. As explained by Mr. Harris in his direct testimony, the Company implemented a number of significant cost-cutting measures in response to the economic downturn beginning in 2008, including a focused reduction in the level of costs incurred in the maintenance of the Company's pumping and T&D systems to a minimum level sufficient to maintain adequate and reliable service. As a result, the Company succeeded in reducing pumping and T&D maintenance expenses by over $130,000 and $380,000, or 23.0 percent and 11.3 percent, from 2007 levels, respectively. Unfortunately, a consequence of the Company's cost-cutting measures was a further reduction in the Company's ability to proactively address and reduce lost and unaccounted for water ("water loss"), as costs related to these efforts are properly charged to maintenance expense when such repairs do not involve retirement units.

Because the Test Year level of pumping and T&D maintenance expense was abnormally low and not representative of the level of costs that would be prudently incurred during normal economic and business conditions (which include a proactive approach to reducing water loss) an adjustment to normalize these expenses is necessary. To this end, the Company performed the statistical methodology of least-squares trend fitting, which relies on the use of historical costs to arrive at a normalized level of pumping and T&D maintenance expenses. This approach is consistent with Staff's recommendations in prior rate proceedings with respect to categories of expenses that are found to be extraordinary and nonrecurring in nature. Income statement adjustment IS-12 increases operating expenses by $636,342 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-13 – ADJUST PURCHASED WATER EXPENSE.

A. Income statement adjustment IS-13, detailed on page 23 of the Appendix to Schedule C-2, is the pro forma adjustment necessary to annualize the cost of purchased water in the White Tank system. In Decision No. 71410 dated December 8, 2009, the Commission authorized a rate increase for Arizona-American Water Company's ("Arizona-American") Agua Fria district, which provides water to the Company's White Tank system. On November 3, 2010, Arizona-American filed a new application for an increase in rates charged by its Agua Fria district (Docket No. 10-0448). Income statement adjustment IS-13 annualizes the rates proposed by Arizona-American in Docket No. 10-0448, resulting in an increase to purchased water expense of $87,457 in the White Tank system. Although Docket No. 10-0448 is currently pending, it is expected to be concluded prior to the instant case, thus allowing time for this pro forma adjustment to be trued-up at a later date.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-14 – ADJUST RATE CASE EXPENSE.

A. Income statement adjustment IS-14, detailed on page 24 of the Appendix to Schedule C-2, is the pro forma adjustment necessary to recover the cost of preparing this rate case. The Company requests recovery of rate case expense currently estimated at $476,874, amortized over three years. This adjustment increases operating expenses by $75,618 in the Western Group.

Q. HOW DID THE COMPANY ARRIVE AT ITS ESTIMATED RATE CASE EXPENSE OF $476,874?

A. The Company's estimated rate case expense is based upon a rate case budget prepared by the Company in consultation with outside counsel, cost of equity expert witness Dr. Zepp, and estimates of other costs such as public notice, printing, and other such expenses.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-15 – ADJUST A&G EXPENSE TO REFLECT ADDITIONAL BEST MANAGEMENT PRACTICES ("BMP")?

A. Income statement adjustment IS-15, detailed on page 25 of the Appendix to Schedule C-2, is the adjustment necessary to recover the costs associated with implementing additional BMPs in the Pinal Valley and White Tank systems, as ordered by the Commission in Decision 71845. Mr. Garfield discusses the implementation of additional BMPs in his direct testimony. Income statement adjustment IS-15 increases operating expenses by $11,925 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-16 – ADJUST DEPRECIATION EXPENSE.

A. Income statement adjustment IS-16, detailed on pages 26 – 30 of the Appendix to Schedule C-2, adjusts depreciation and amortization expense to reflect the adjusted end-of-Test Year plant balances and current depreciation rates. The effect of this adjustment is to annualize depreciation expense related to utility plant placed in service during the Test Year, as well as post-Test Year utility plant. This adjustment to annualize depreciation and amortization expense increases operating expenses by $259,773 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-17 – SYNCHRONIZE INTEREST EXPENSE WITH RATE BASE.

A. Income statement adjustment IS-17, detailed on page 31 of the Appendix to Schedule C-2, is the adjustment necessary to synchronize interest expense with the Test Year adjusted rate base. Although this adjustment is "below-the-line", it is required in order to properly calculate the adjustment to federal and state income taxes (income statement adjustment IS-20), as well as illustrate the effect of all other pro forma adjustments and the required increase in gross revenues on net income. Income statement adjustment IS-17 increases interest expense by $3,553 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-18 – REMOVE OTHER INCOME AND DEDUCTIONS.

A. Income statement adjustment IS-18, detailed on page 32 of the Appendix to Schedule C-2, is another below-the-line adjustment required to properly illustrate the effect of all other pro forma adjustments and the required increase in gross revenues on net income. Income statement adjustment IS-18 increases other income by $86,304 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-19 – ADJUST PROPERTY TAXES.

A. Income statement adjustment IS-19, detailed on pages 33 – 34 of the Appendix to Schedule C-2, adjusts property taxes to reflect the effect of known and measurable changes in revenues, as reflected in the Company's rate application. The pro forma adjustment utilizes the current methodology used by the Arizona Department of Revenue to determine an amount that is referred to as "full cash value" for each of the Company's water systems. Income statement adjustment IS-19 increases Test Year property taxes by $275,731 in the Western Group.

Q. PLEASE EXPLAIN INCOME STATEMENT ADJUSTMENT IS-20 – ADJUST INCOME TAXES.

A. Income statement adjustment IS-20, detailed on pages 35–36 of the Appendix to Schedule C-2, adjusts Federal and state income taxes to reflect the tax-effect of all other pro forma adjustments. Income statement adjustment IS-20 decreases Test Year income tax expense by $203,582 in the Western Group.

VII. Cost of Service Study ("COSS") and Rate Design

Q. WHAT IS A COSS?

A. A COSS is a study which allocates a utility's investment and expenses to different classes of customers and provides a basis for allocating future revenues to customer classes via the rate design. Under cost of service ratemaking, each customer class should pay rates that are commensurate with the cost of providing service to that class. In reality, rates that are not consistent with cost of service principles can still be found to be in the public interest. Such rate structures may include the intended subsidization of one particular class of customers by another class of customers for the overall benefit of all customers, subsidization within a customer class via a lifeline rate, or the subsidization of smaller volume users by larger volume users via a conservation-oriented rate design.

Q. WHY DID YOU PREPARE A COSS IN THIS PROCEEDING?

A. The COSS, set forth in Schedules G-1 through G-7 of the Company's application, provides a starting point for determining how proposed revenues should be allocated to the residential, commercial, industrial, and private fire service customer classes. Additionally, the COSS reveals how revenues should be allocated between fixed basic service charges and volumetric/commodity rates. The COSS is also useful in developing a residential rate structure that provides incentives for conservation in the form of increasing cost discounts for reduced usage.

Q. HOW DID YOU PREPARE THE COMPANY'S COSS?

A. I prepared the COSS using the "commodity demand" method, whereby costs (both capital-related and operating) are separated into four functions; commodity, demand, customer, and direct private fire. Commodity costs are costs that tend to vary with the quantity of water produced. Demand costs are associated with providing facilities to meet peak demands placed on the system by customers. Customer costs comprise those costs associated with serving customers regardless of the amount of water they use. These cost functions are then distributed to the residential, commercial and industrial customer classes to derive an estimate of the cost of providing service to each class. In separating the various costs into functions (Schedule G-7), I relied on the allocation factors utilized by the Company and accepted by Staff and RUCO in Docket 08-0440.[5] The Company's COSS at present and proposed rates is summarized in Schedules G-1 and G-2, respectively.

Q. IN SECTION IV OF YOUR TESTIMONY YOU MENTIONED THAT THE COMPANY IS PROPOSING A PHASED CONSOLIDATION OF THE PINAL VALLEY AND WHITE TANK WATER SYSTEMS. IS THE COMPANY'S PROPOSED RATE CONSOLIDATION SUPPORTED BY THE COSS WITH RESPECT TO RESIDENTIAL CUSTOMERS?

A. Yes. The COSS provides the information necessary to design a consolidated water rate structure that protects residential customers located in the Pinal Valley and White Tank systems from paying any more than the cost of providing service on a stand-alone (unconsolidated) basis. As a result, the Company's proposed residential rate structure in each water system, including those systems where the Company is proposing rate consolidation, produces revenues that are equal to or

[5]Certain allocation factors reflect those recommended by Staff and accepted by the Company in Docket No. 08-0440.

below the residential cost of service. The result of this proposed rate structure is shown in Schedule G-2, column B, line 24.

Q. HOW DID YOU APPROACH THE COMPANY'S PROPOSED RATE DESIGN?

A. The COSS provides a basis for designing separate rate schedules for the residential, commercial and industrial customer classes. Once a target revenue requirement was determined for each customer class using the "commodity demand" method, and certain policy issues (discussed below) were taken into consideration, rates were developed to generate the revenue requirement. For water systems where the Company is proposing rate consolidation, as discussed by Mr. Harris in his direct testimony, rates were developed to provide the total revenue requirement of the combined systems. The consolidated revenue adjustment shown in column F, line 51, of Schedule H-2 represents revenue shifting between systems that the Company proposes to consolidate. The Company's rate design for each water system is shown in Schedule H-3 and a typical bill analysis is shown in Schedule H-4.

Q. WHAT POLICY ISSUES WERE CONSIDERED WHEN DEVELOPING THE COMPANY'S PROPOSED RATES?

A. The Company took four policy issues into consideration when developing its proposed rate design in this proceeding. They are:

1. Gradualism – The Company proposes to bring rates for each customer class closer to the cost of providing service to that class in gradual steps rather than by drastic change.

2. Inter-system subsidies – The Company continues its policy, set forth and adopted by the Commission in its most recent companywide rate case, of avoiding inter-system residential rate subsidies between two or more service areas that are being consolidated for ratemaking purposes.

3. Affordability – The rate design should provide discounts to residential customers who use a minimal amount of water, without discrimination based on income or ability to pay.

4. Cost recovery – The rate design should provide reasonable assurance that the Company will recover its cost of providing service in an environment of declining usage.

Q. PLEASE DISCUSS GRADUALISM.

A. The first policy issue considered when developing the Company's proposed rate design was gradualism. As shown on page 1, column D, lines 36 and 38 of Schedule G-1, the required increase in gross revenues for the industrial class is negative, indicating that present rate revenues from this class are, on average, somewhat greater than its cost of service. However, the Company chose not to reduce the overall level of revenues allocated to the industrial class. Costs are expected to continue to increase in the future, and the Company instead proposes to bring rates closer to the cost of service by gradual steps rather than by drastic change.

The Company has proposed rates for private fire service customers consistent with this approach. The modest increase proposed by the Company, shown on lines 26 and 28 of Schedule G-2, brings rates for this class closer to the cost of service. This principle is a continuation of the approach taken by the Company in its last rate proceeding, which the Commission found to be just and reasonable in Decision 71845.[6]

Q. PLEASE DISCUSS INTER-SYSTEM SUBSIDIES.

A. The second policy issue considered when developing the Company's proposed rate design was residential inter-system subsidies. Residential inter-system subsidies have long been a concern preventing the consolidation of water systems

[6] See Decision 71845, p. 84 at 21.

with different unit costs of service. The Company's proposed rate design avoids these types of subsidies in systems where the Company is proposing rate consolidation. This goal is accomplished by holding residential revenues at or below the cost of service, meaning that residents of one service area will not subsidize the residents of another service area after their rates have been consolidated. This was the approach taken by the Company in Docket No. 08-0440, in which the Company proposed rate consolidation of its Superstition and Miami; Bisbee and Sierra Vista; Casa Grande, Coolidge and Stanfield; Lakeside and Overgaard; and Sedona, Pinewood and Rimrock systems. The Commission adopted the Company's approach in Decision 71845, and as a result, residential customers in these systems enjoy the benefits of rate consolidation without the burden of providing subsidies.

Q. PLEASE DISCUSS AFFORDABILITY.

A. The third policy issue considered when developing the Company's proposed rate design was affordability. The Commission has become increasingly concerned with affordability and as a result has authorized various low-income assistance programs. To address this concern, the Company's proposed rate design includes a lifeline rate which provides a minimal amount of water at cost discounts ranging from 5.53 percent to 30.14 percent to all residential ⅝-inch customers independent of income level or ability to pay, thus helping to keep water bills affordable for basic needs. The Company's proposed rate design provides additional discounts for residential customers beyond the lifeline rate as well. Under the Company's proposed rate design, residential customers in each system will benefit from cost discounts ranging from 7.74 percent to 27.52 percent at the average level of consumption. These discounts are shown on lines 47 and 50 of Schedule H-4.

Q. PLEASE DISCUSS COST RECOVERY.

A. The fourth and final policy issue considered when developing the Company's proposed rate design was cost recovery in an environment of declining usage. Given state policy mandates for consumers to conserve precious water resources, the Commission has required conservation-oriented inverted tier rates to become the standard in Arizona. The Commission first implemented inverted tier rates in the Company's Eastern Group in 2004 and in the Western Group in 2005. Since that time, the Company has experienced a downward trend in average usage per customer in seven out of its eight systems that had inverted tier rates at the end of 2009.[7] The continuing decline in customer usage has made it increasingly difficult for the Company to recover its cost of providing service, and partly as a result of that decline, the Company began preparing a new rate application after the conclusion of its 2007 Test Year rate proceeding (Docket No. 08-0440). In this proceeding, the Company addresses the issue of declining usage and its effect on the Company's ability to recover its cost of service, and proposes an approach designed to mitigate this problem.

Q. HOW DOES THE COMPANY PROPOSE TO ADDRESS THE ISSUE OF DECLINING USAGE IN THIS PROCEEDING?

A. The Company proposes to address the issue of declining customer usage and the detrimental effect it has on the Company's ability to recover the cost of service by recovering a greater portion of its fixed costs via the fixed basic service charge. An approach similar to this was recently proposed by the Global Water utilities for Santa Cruz Water Company in Docket No. W-20446A-09-0080 (et al.), and ultimately adopted by the Commission in Decision No. 71878 (September 14, 2010). In that case the Commission adopted, without the benefit of a COSS, a fixed basic service/monthly minimum charge designed to recover 50 percent of the

[7]Superstition, Cochise, San Manuel, Oracle, Winkelman, Pinal Valley, and Ajo.

utility's revenue requirement in conjunction with the transition from a flat commodity rate to a conservation-oriented inverted tier rate structure.

As mentioned above, the Commission directed the Company to implement a conservation-oriented inverted tier rate structure in the Eastern and Western Groups in 2004 and 2005, respectively. Additionally, effective July 1, 2010, the Commission directed the Company to implement an inverted tier rate structure in its Northern Group (see Decision 71845, Exhibit A). Inherent in this rate structure are monetary incentives for customers to conserve, which come in the form of cost discounts. Consequently, the Company has witnessed a steady decline in customer usage in the Eastern and Western Groups over the last several years, and expects usage in the Northern Group to decline as well. The deleterious effect this decline in usage has on the financial stability of the Company comes at a time when the Company's earnings have fallen to a level that greatly restricts its ability to fund much needed infrastructure replacement programs. Over time, this can affect the Company's ability to provide reliable and adequate water service to its customers.

As shown on page 1, lines 48 and 49 of Schedule G-1, the COSS indicates that no less than 48 percent of the revenues in the Western Group should be recovered via the fixed basic service charge. To mitigate the effect of declining usage on the Company's ability to recover its cost of service, the Company is proposing a fixed basic service charge designed to recover 50 percent of the overall revenue requirement in the Western Group.

Q. HAVE YOU PERFORMED ANY STATISTICAL STUDIES WHICH SUPPORT THE COMPANY'S FINDING THAT CUSTOMER USAGE IS DECLINING?

A. Yes. In the Company's most recent rate case (Docket No. 08-0440) I conducted a statistical study of the effect of an inverted tier rate design on residential consumption in the Western Group,[8] and two statistical studies of customer usage over time in each of the Company's systems that had inverted tier rates in effect at that time.[9] Each of those studies showed a marked decline in residential usage.

Q. HAVE YOU PERFORMED ANY ADDITIONAL STUDIES OF CUSTOMER USAGE?

A. Yes. Attached hereto as Exhibit JMR-5 is my most recent and comprehensive study of customer usage. Exhibit JMR-5 is a multiple regression analysis of monthly residential, commercial, and combined residential/commercial usage from January 2000 through December 2009 using the exponential trend model.[10] This model controls for average monthly temperature, total monthly precipitation, drought conditions,[11] and seasonal variations not related to weather. In other words, the model holds all of these factors constant to determine whether residential and commercial customers are using more or less water on a monthly basis over time. The results of this study are summarized on page 1 of Exhibit JMR-5. Panel D, columns G, I, and K show the indicated annual growth rate in usage per residential, commercial, and combined residential/commercial customers, respectively. Columns H, J, and L report the t-statistic, or statistical significance, of the estimates.

Q. WHAT ARE THE RESULTS OF YOUR USAGE STUDY?

A. The results of this study, summarized in the table below, show that residential and combined residential/commercial per customer usage is declining in every water system that had tiered rates in effect at the end of 2009, except the White Tank system. The only two water systems that did not have statistically significant results indicating a decline in per customer usage other than White Tank were the

[8]See Docket No. 08-0440, Reiker direct testimony, Exhibit JMR-4.
[9]See Docket No. 08-0440, Reiker rebuttal testimony, Exhibits JMR-RB4 through JMR-RB7, and Reiker rate design and cost of service rebuttal testimony, Exhibit JMR-RBEX3.
[10]The exponential trend model is a linear trend regression model with a natural log transformation applied to the dependent variable.
[11]As measured by the Palmer Drought Severity Index.

Navajo and Verde Valley (including Sedona) systems in the Northern Group. This result is not surprising, as these two Northern Group systems did not have a conservation-oriented, inverted tier rate structure in effect during the study period.

Annual Growth/(Decline) in Usage Per Customer[12]

	Residential	Commercial	Combined Residential/ Commercial
Superstition	(1.069%)	(2.712%)	(1.509%)
Cochise	(2.848%)	2.790%	(1.536%)
San Manuel/Oracle/Winkelman	(3.318%)	(0.502%)	(2.664%)
Pinal Valley	(3.786%)	1.130%	(3.143%)
Ajo	(1.650%)	(0.874%)	(1.581%)
White Tank	2.478%	2.702%	3.053%
Navajo	0.000%	0.000%	0.000%
Verde Valley	0.000%	0.000%	0.000%
Total Company	(1.289%)	0.492%	(1.040%)
Western Group	(3.089%)	1.428%	(2.520%)

The study shown in Exhibit JMR-5 and summarized in the table above indicates that customers who pay rates that are designed to encourage conservation do just that, they use less water. Based upon this evidence and the Company's past experience with inverted tier rates, it is imperative that analyses, such as the COSS presented here, be performed to assess the magnitude of the unrecovered costs resulting from customers' ongoing water conservation.

Q. THE COSS INDICATES THAT NO LESS THAN 48 PERCENT OF THE WESTERN GROUP'S REVENUES SHOULD BE RECOVERED VIA THE FIXED BASIC SERVICE CHARGE. THEREFORE, WOULDN'T IT SUFFICE TO DESIGN A BASIC SERVICE CHARGE TO RECOVER 48 PERCENT OF THE REVENUE REQUIREMENT, AND NO MORE?

[12]Results are reported based on statistical significance, i.e. if the co-efficient was not statistically different from zero, then 0.000 percent is shown.

A. No. A basic service charge designed to recover 48 percent of the revenue requirement would only be sufficient if implementing a flat volumetric/commodity rate. Under an inverted tier rate design, the highest tier commodity rate will always be higher than cost when the fixed basic service charge is set at or below the level suggested by the COSS. As a result, a portion of the utility's costs will go unrecovered as customers continue to cut back their water usage. This result is illustrated in Exhibit JMR-6 as well as the graph below, both of which are based on the residential cost of service in the Pinal Valley water system:

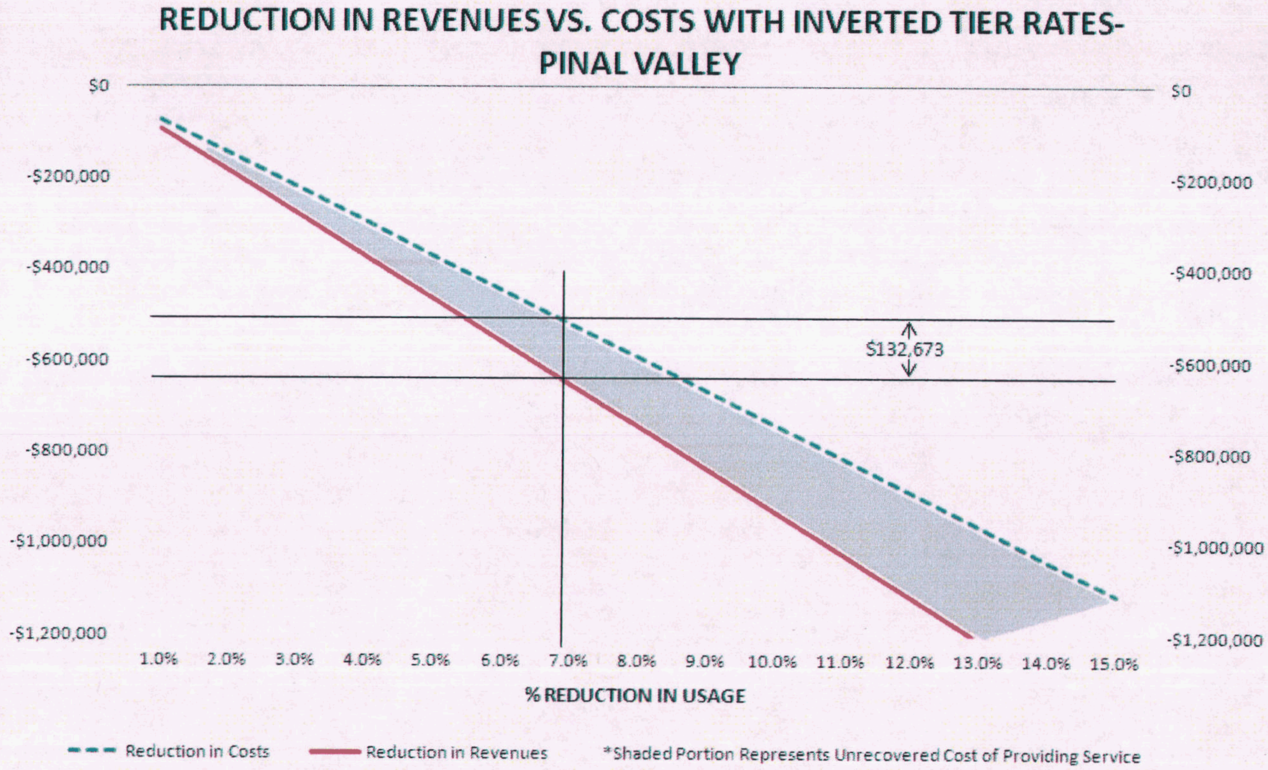

Exhibit JMR-6 and the graph shown above reflect an inverted tier rate design with a fixed basic service charge set at the level suggested by the COSS, and three commodity rate tiers with break-over points at 3,000 and 10,000 gallons, whose rates increase by 25 percent from one tier to the next. The dashed line in the above graph represents the reduction in adjusted Test Year costs, while the solid line represents the reduction in revenues at increasing percentage reductions in usage. The shaded portion in the above graph represents the amount of Pinal Valley's residential cost of service that goes unrecovered as a result of conservation. Based on the COSS and the rate design reflected in Exhibit JMR-6 and the graph shown above, a modest 7 percent reduction in customer usage reduces revenues and costs by $651,860 and $519,187, respectively. The difference, $132,673, represents unrecovered costs incurred by the Company in providing service to residential customers in the Pinal Valley water system. That significant shortfall in cost recovery increases linearly from the first 1,000 gallons curtailed.

Q. WILL IMPLEMENTING A RATE DESIGN WITH A FIXED BASIC SERVICE CHARGE DESIGNED TO RECOVER 50 PERCENT OF THE OVERALL REVENUE REQUIREMENT IN THE WESTERN GROUP ENABLE THE COMPANY TO FULLY RECOVER ITS COST OF SERVICE IN AN ENVIRONMENT OF DECLINING USAGE?

A. No. Because the resulting rate design still incorporates a commodity rate in the highest tier which is higher than cost, the Company's proposal, at best, can only lessen the problem. However, there are mechanisms designed to fully address the revenue effects resulting from an inverted tier rate design, which the Company understands the Commission expects to examine in a generic docket. Such a docket was ordered by the Commission as a compliance item to Decision 71845. In that Decision, the Commission committed to opening a generic docket to examine the disincentives to the promotion of water conservation and methods to mitigate these disincentives.[13] The Commission is expected to evaluate other mechanisms such as revenue stabilization funds and water revenue adjustment

[13]See Decision 71845, p. 94 at 19-21.

mechanisms in that generic docket, in addition to the Company's proposal herein with respect to rate design.

Q. WHAT ARE SOME OTHER ASPECTS OF THE COMPANY'S PROPOSED RATE DESIGN IN THIS PROCEEDING?

A. The Company's proposed rate design incorporates the same basic principles that were proposed by the Company, and adopted by the Commission, in Decision 71845. The fixed basic service charge for the residential, commercial, and industrial customer classes is based on the volumetric capacity of each meter size relative to a ⅝-inch meter. The residential ⅝-inch commodity rate is a three-tiered increasing block structure with break-over points set at 3,000 and 10,000 gallons. Commodity rates increase at a rate of 25% from one rate tier to the next, consistent with the current rate design. For residential meters larger than ⅝-inch, a two-tiered structure was used with the break-over point set at 10,000 gallons for a 1-inch meter and scaled higher based on meter size for larger meters. The commercial rate design incorporates two tiers with the break-over point set at 10,000 gallons for a ⅝-inch meter and scaled higher based on meter size for larger meters. Consistent with the rate design approved for industrial customers and customers purchasing water for resale in Decision 71845, the Company proposes a single-tier commodity rate in this proceeding.

Q. WHAT IS THE COMPANY PROPOSING WITH RESPECT TO CUSTOMERS PURCHASING WATER FOR CONSTRUCTION?

A. The Company proposes to charge the same inverted-tier rates for construction water as those proposed for commercial customers with the corresponding meter size.

Q. IS THE COMPANY PROPOSING ANY CHANGES TO ITS COMPANY-WIDE PRIVATE FIRE SERVICE TARIFF?

A. Yes. In order to bring rates for private fire service closer to the cost of service, the Company is proposing a modest increase from current rates to a uniform monthly charge of $27.00 (for all meter connection sizes) in all systems in the Western Group.

Q. IS THE COMPANY PROPOSING ANY CHANGES TO ITS COMPANY-WIDE SERVICE CHARGE TARIFF?

A. Yes. The Company is proposing a number of changes to its service charges for the Western Group to bring them more in line with those charged by other Commission-regulated water utilities. The Company is proposing increases in its charges for service establishment, reconnection, service call-outs, and meter re-reads. The charges proposed by the Company are based on a study of 32 Commission rate decisions and are shown on page 25 of Schedule H-3. The Company is also proposing changes to its service line and meter installation charges.

Q. PLEASE DESCRIBE THE COMPANY'S PROPOSED CHANGES TO ITS SERVICE LINE AND METER INSTALLATION CHARGES.

A. In its most recent rate case (Docket No. 08-0440) the Company proposed, and the Commission adopted, service line and meter installation charges recommended by Staff engineer Marlin Scott, Jr. in his memo dated February 21, 2008. Unfortunately, the Company has found that those charges, particularly for services 3-inches and larger and those which require boring under a road or highway, do not recover the actual costs of installing these services. As a result, the Company incurs additional costs which ultimately need to be recovered through general service rates from customers not connected to that particular service.[14] Therefore, the Company is proposing changes to its service line and meter installation tariff for the Western Group, consistent with prior Commission Decisions,[15] such that charges for services 3-inches and larger are based on actual cost. Additionally, the Company proposes to add a provision to its service line and meter installation tariff requiring parties to pay the actual cost of ⅝-inch through 2-inch service lines when boring is required.

Q. IS THE COMPANY PROPOSING TO CHANGE THE FORMAT OF ITS GENERAL SERVICE TARIFF?

A. No. The Company is not proposing changes to the format of its general service tariff in this proceeding.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

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[14]Per Commission rule, service line and meter installation charges are treated as refundable advances and have no effect on operating revenue. Any additional costs above and beyond what is recoverable via the service line and meter installation charges reflect the Company's own investment in plant.

[15]See Decision No. 71410, dated December 8, 2009, and Decision No. 71445, dated December 23, 2009.

APPENDIX A

Jurisdiction	Company Name(s)	Case No.	Type of Proceeding
Arizona	Ajo Improvement Co. - Electric	99-0564	Cost of Capital
Arizona	Alltel Corp.	00-0874	Sale of Assets
Arizona	Anway Manville Water	99-0360	Financing
Arizona	Arizona Public Service Company	03-0437	Cost of Capital
Arizona	Arizona Public Service Company	01-0878	Financing
Arizona	Arizona Public Service Company	02-0125	Financing
Arizona	Arizona Water Company	99-0437	Monitoring Assistance Program Surcharge
Arizona	Arizona Water Company	00-0962	Cost of Capital / Arsenic Cost Recovery Mechanism (Sedona, Rimrock)
Arizona	Arizona Water Company	02-0619	Cost of Capital / Arsenic Cost Recovery Mechanism (Superstition, San Manuel)
Arizona	Arizona Water Company	04-0650	Arsenic Cost Recovery Mechanism (Casa Grande, Stanfield, White Tank)
Arizona	Arizona Water Company	07-0436	Purchased Power Adjuster
Arizona	Arizona Water Company	08-0440	Rates (Revenue Requirement, Cost of Service, Rate Design)
Arizona	Arizona American Water Company	02-0867	Cost of Capital
Arizona	Arizona American Water Company	01-0983	Restructure of Holding Co.
Arizona	Arizona American Water Company	05-0405	Rates (Paradise Valley)
Arizona	Arizona American Water Company	05-0718	Financing (White Tanks)
Arizona	Arizona American Water Company	06-0014	Rates (Mohave Water/Mohave Wastewater)
Arizona	Arizona American Water Company	06-0491	Rates (Sun City Wastewater/Sun City West Wastewater)
Arizona	Arizona American Water Company	05-0280 et al.	Arsenic Cost Recovery Mechanism - Havasu
Arizona	Arizona American Water Company	05-0280 et al.	Arsenic Cost Recovery Mechanism - Agua Fria
Arizona	Arizona American Water Company	05-0280 et al.	Arsenic Cost Recovery Mechanism - Sun City West
Arizona	Arizona American Water Company	05-0280 et al.	Arsenic Cost Recovery Mechanism - Paradise Valley
Arizona	Arizona American Water Company	07-0209	Rates (Sun City Water)
Arizona	Avra Water Co-op	00-0269	Rate of return
Arizona	Bella Vista Water	01-0776	Cost of Capital
Arizona	Bella Vista Water	99-0466	Financing
Arizona	Black Mountain Gas	00-0283	Cost of Capital
Arizona	Black Mountain Gas	01-0263	Cost of Capital
Arizona	Black Mountain Gas/Northern States Pwr.	99-0525	Restructure of Holding Co.
Arizona	BLT, Touch One, MCI	00-0881	Merger

Arizona	Continental Divide Electric Co-op	00-0504	Sale of Assets
Arizona	Eschelon Telecom	01-0270	Financing
Arizona	Gateway Technologies/T-NETIX (COPT)	99-0459	Merger
Arizona	Gold Canyon Sewer Company	00-0638	Cost of Capital
Arizona	Golden Shores Water	99-0390	Financing
Arizona	Green Valley Water Co.	01-0559	Cost of Capital
Arizona	GST Net/Time Warner Telecom	00-0782	Sale of Assets
Arizona	Lago Del Oro Water Company	00-0206	Financing
Arizona	Litchfield Park Service Co.	01-0487	Cost of Capital
Arizona	Midvale Telephone	00-0512	Cost of Capital
Arizona	Mountain Pass Utility	01-0166	Financing
Arizona	Navopache Electric Co-op	00-0820	Financing
Arizona	New River Utility	01-0662	Cost of Capital
Arizona	North Mohave Valley Water	99-0295	Financing
Arizona	Picacho Sewer Co.	01-0165	Financing
Arizona	Picacho Water	01-0169	Financing
Arizona	Pine Water Company	03-0279	Cost of Capital
Arizona	Premiere Communications/Telecare	00-0787	Sale of Assets
Arizona	Qwest Communications	03-0454	Cost of Capital
Arizona	Ridgeview Utility	01-0167	Financing
Arizona	Rio Rico Utilities, Inc.	03-0434	Cost of Capital
Arizona	SBC Telecom	00-0762	Waiver
Arizona	Southwest Gas/Black Mountian Gas	02-0425	Merger
Arizona	Southwestern Telephone	00-0379	Cost of Capital
Arizona	Sulphur Springs Valley Electric Co-op	00-0629	Financing
Arizona	Table Top Telephone	99-0595	Cost of Capital
Arizona	Teligent	00-1521	Merger
Arizona	Trico/AEPCO	00-0660	Lease
Arizona	Tucson Electric Power Company	00-0550	Sale of Assets
Arizona	Tucson Electric Power Company	99-0573	Capital Lease Amendment
Arizona	Tucson Electric Power Company	02-0276	Financing
Arizona	UniSource Energy Corporation	03-0933	Reorganization/Merger
Arizona	Water Utility of Greater Buckeye	98-0326	Financing
Arizona	Winstar Wireless	00-0446	Encumbrance of Assets
Arizona	Yucca Water Co.	99-0260	Financing
Arizona	Graham Co. Utilities Water	97-0407	Financing
Arizona	Mount Tipton	01-0557	Financing
Arizona	Northern States Power/Black Mountain Gas	00-0235	FUCO Certification
Arizona	Valley Pioneers Water Company	00-0696	Financing
California	California American Water Company	A.06-01-005	Cost of Capital
California	California American Water Company	A.07-01-036	Cost of Equity
New Mexico	New Mexico American Water Company	05-00353-UT	Approval of Special Contract

JMR-1

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Casa Grande)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302					Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07
1	M&I Balance as of 12/31/2003			$ 3,382,907				$ 3,525,803
2	Less: Amount Included in Rate Base - Dec. 68302				$ 142,896	279 AF[1]		(142,896)
3	2004 M&I charges on 8,605 AF	$ 30 /AF		258,150				266,520
4	NP-260 Tariff M&I charges			(98,370)				(98,371)
5	AFUDC			192,492			5.09%	186,400
6	Balacne as of 12/31/04			3,735,179				3,737,456
7								
8	2005 M&I charges on 8,605 AF	$ 28 /AF		240,940				230,984
9	NP-260 Tariff M&I charges			(63,812)				(87,372)
10	AFUDC			212,160			9.05%	366,382
11	Balacne as of 12/31/05			4,124,467				4,247,450
12								
13	2006 M&I charges on 8,605 AF	$ 24 /AF		206,520				199,890
14	NP-260 Tariff M&I charges			(54,696)				(76,340)
15	Hook-up Fees Collected ($208)		1,986	(413,088)				(1,400,058)
16	Interest Earned on CAP Chgs. Pd. from '87 - '94			-				(43,465)
17	AFUDC			201,312			8.62%	366,304
18	Balacne as of 12/31/06			4,064,515				3,293,781
19								
20	2007 M&I charges on 8,605 AF	$ 21 /AF		180,705				186,564
21	NP-260 Tariff M&I charges			(47,859)				(67,608)
22	Hook-up Fees Collected ($208)		2,202	(458,016)				(581,632)
23	AFUDC			194,857			7.09%	238,190
24	Less: Amount Included in Rate Base - Dec. 71845				$ 447,196	1,003 AF[2]		$ (447,196)
25	Balacne as of 12/31/07			3,934,202				2,622,099
26								
27	2008 M&I charges on 7,602 AF	$ 21 /AF		180,705				173,238
28	NP-260 Tariff M&I charges			(47,859)				(60,683)
29	Hook-up Fees Collected ($208)		2,202	(458,016)				(189,205)
30	AFUDC			188,067				232,794
31	Balacne as of 12/31/08			3,797,099			7.09%	2,778,243
32								
33	2009 M&I charges on 7,602 AF	$ 21 /AF		180,705				146,586
34	NP-260 Tariff M&I charges			(47,859)				(51,487)
35	Hook-up Fees Collected ($208)		2,202	(458,016)				(40,780)
36	AFUDC			180,922				239,302
37	Balacne as of 12/31/09			3,652,851			7.09%	3,071,864
38								
39	2010 M&I charges on 7,602 AF	$ 21 /AF		180,705				
40	NP-260 Tariff M&I charges			(47,859)				
41	Hook-up Fees Collected ($208)		2,202	(458,016)				
42	AFUDC			173,405				
43	Balacne as of 12/31/10			3,501,086				
44								
45	2011 M&I charges on 7,602 AF	$ 21 /AF		180,705				
46	NP-260 Tariff M&I charges			(47,859)				
47	Hook-up Fees Collected ($208)		2,202	(458,016)				
48	AFUDC			165,497				
49	Balacne as of 12/31/11			3,341,413				
50								
51	2012 M&I charges on 7,602 AF	$ 21 /AF		180,705				
52	NP-260 Tariff M&I charges			(47,859)				
53	Hook-up Fees Collected ($208)		2,202	(458,016)				
54	AFUDC			157,176				
55	Balacne as of 12/31/12			3,173,419				

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Casa Grande)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302					Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07
1								
2	2013 M&I charges on 7,602 AF	$ 21 /AF		180,705				
3	NP-260 Tariff M&I charges			(47,859)				
4	Hook-up Fees Collected ($208)		2,202	(458,016)				
5	AFUDC			148,422				
6	Balacne as of 12/31/13			2,996,671				
7								
8	2014 M&I charges on 7,602 AF	$ 21 /AF		180,705				
9	NP-260 Tariff M&I charges			(47,859)				
10	Hook-up Fees Collected ($208)		2,202	(458,016)				
11	AFUDC			139,212				
12	Balacne as of 12/31/14			2,810,713				
13								
14	2015 M&I charges on 7,602 AF	$ 21 /AF		180,705				
15	NP-260 Tariff M&I charges			(47,859)				
16	Hook-up Fees Collected ($208)		2,202	(458,016)				
17	AFUDC			129,522				
18	Balacne as of 12/31/15			2,615,065				
19								
20	2016 M&I charges on 7,602 AF	$ 21 /AF		180,705				
21	NP-260 Tariff M&I charges			(47,859)				
22	Hook-up Fees Collected ($208)		2,202	(458,016)				
23	AFUDC			119,326				
24	Balacne as of 12/31/16			2,409,221				
25								
26	2017 M&I charges on 7,602 AF	$ 21 /AF		180,705				
27	NP-260 Tariff M&I charges			(47,859)				
28	Hook-up Fees Collected ($208)		2,202	(458,016)				
29	AFUDC			108,600				
30	Balacne as of 12/31/17			2,192,651				
31								
32	2018 M&I charges on 7,602 AF	$ 21 /AF		180,705				
33	NP-260 Tariff M&I charges			(47,859)				
34	Hook-up Fees Collected ($208)		2,202	(458,016)				
35	AFUDC			97,314				
36	Balacne as of 12/31/18			1,964,795				
37								
38	2019 M&I charges on 7,602 AF	$ 21 /AF		180,705				
39	NP-260 Tariff M&I charges			(47,859)				
40	Hook-up Fees Collected ($208)		2,202	(458,016)				
41	AFUDC			85,441				
42	Balacne as of 12/31/19			1,725,066				
43								
44	2020 M&I charges on 7,602 AF	$ 21 /AF		180,705				
45	NP-260 Tariff M&I charges			(47,859)				
46	Hook-up Fees Collected ($208)		2,202	(458,016)				
47	AFUDC			72,949				
48	Balacne as of 12/31/20			1,472,845				
49								
50	2021 M&I charges on 7,602 AF	$ 21 /AF		180,705				
51	NP-260 Tariff M&I charges			(47,859)				
52	Hook-up Fees Collected ($208)		2,202	(458,016)				
53	AFUDC			59,805				
54	Balacne as of 12/31/21			1,207,480				
55								

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Casa Grande)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302					Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07
1								
2	2022 M&I charges on 7,602 AF	$ 21 /AF		180,705				
3	NP-260 Tariff M&I charges			(47,859)				
4	Hook-up Fees Collected ($208)		2,202	(458,016)				
5	AFUDC			45,977				
6	Balacne as of 12/31/22			928,287				
7								
8	2023 M&I charges on 7,602 AF	$ 21 /AF		180,705				
9	NP-260 Tariff M&I charges			(47,859)				
10	Hook-up Fees Collected ($208)		2,202	(458,016)				
11	AFUDC			31,428				
12	Balacne as of 12/31/23			634,545				
13								
14	2024 M&I charges on 7,602 AF	$ 21 /AF		180,705				
15	NP-260 Tariff M&I charges			(47,859)				
16	Hook-up Fees Collected ($208)		2,202	(458,016)				
17	AFUDC			16,122				
18	Balacne as of 12/31/24			325,497				
19								
20	2025 M&I charges on 7,602 AF	$ 21 /AF		180,705				
21	NP-260 Tariff M&I charges			(47,859)				
22	Hook-up Fees Collected ($208)		2,202	(458,016)				
23	AFUDC			17				
24	Balacne as of 12/31/25			344				

50 [1]During T.Y. 2003 279 AF of untreated CAP Water were sold to golf courses who were not contractually obligated to reimburse the Company for a portion of previously deferred M&I charges.
51 Per Dec. 68302 this 279 AF was deemed used & useful, therefore, (279/(8,884-2,000)=4.0529% X $3,525,803) = $142,896 in previously deferred M&I charges was included in rate base
52 to be amortized to expense over 20 years.
53 [2]During T.Y. 2007 1,003 AF of untreated CAP water were sold to golf courses who were not contractually obligated to reimburse the Company for a portion of previously deferred M&I charges.
54 Per Dec. 71845 this 1,003 was deemed used & useful, therefore, (1,003/(8,884 - 2,000) = 14.57% X $3,069,295 = $447,196 in previously deferred M&I charges was included in rate base
55 to be amortized to expense over 20 years.

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ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Coolidge)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302			Amt. Incl. in Rate Base		Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Dec. 68302		AFUDC Rate	Activity Thru. Dec. '07
1	M&I Balance as of 12/31/2003			$ 1,046,011	-			$ 1,046,011
2								
3	2004 M&I charges on 2,000 AF	$ 30 /AF		60,000				60,000
4	NP-260 Tariff M&I charges			-				-
5	AFUDC			57,634			5.09%	55,234
6	Balacne as of 12/31/04			1,163,645				1,161,245
7								
8	2005 M&I charges on 2,000 AF	$ 28 /AF		56,000				52,000
9	NP-260 Tariff M&I charges			-				-
10	AFUDC			63,556			9.05%	109,584
11	Balacne as of 12/31/05			1,283,201				1,322,829
12								
13	2006 M&I charges on 2,000 AF	$ 24 /AF		48,000				45,000
14	NP-260 Tariff M&I charges			-				-
15	Hook-up Fees Collected ($150)		1,000	(150,000)				(319,171)
16	Interest Earned on CAP Chgs. Pd. from '87 - '94			-				(9,785)
17	AFUDC			61,552			8.62%	113,418
18	Balacne as of 12/31/06			1,242,753				1,152,291
19								
20	2007 M&I charges on 2,000 AF	$ 21 /AF		42,000				42,000
21	NP-260 Tariff M&I charges			-				-
22	Hook-up Fees Collected ($150)		1,000	(150,000)				(200,550)
23	AFUDC			59,132			7.09%	78,304
24								
25	Balacne as of 12/31/07			1,193,885				1,072,045
26								
27	2008 M&I charges on 2,000 AF	$ 21 /AF		42,000				39,000
28	NP-260 Tariff M&I charges			-				-
29	Hook-up Fees Collected ($150)		1,000	(150,000)				(16,000)
30	AFUDC			56,585				78,064
31	Balacne as of 12/31/08			1,142,470			7.09%	1,173,109
32								
33	2009 M&I charges on 2,000 AF	$ 21 /AF		42,000				33,000
34	NP-260 Tariff M&I charges			-				-
35	Hook-up Fees Collected ($150)		1,000	(150,000)				(3,000)
36	AFUDC			53,906				83,144
37	Balacne as of 12/31/09			1,088,376			7.09%	1,286,253
38								
39	2010 M&I charges on 2,000 AF	$ 21 /AF		42,000				
40	NP-260 Tariff M&I charges			-				
41	Hook-up Fees Collected ($150)		1,000	(150,000)				
42	AFUDC			51,087				
43	Balacne as of 12/31/10			1,031,463				
44								
45	2011 M&I charges on 2,000 AF	$ 21 /AF		42,000				
46	NP-260 Tariff M&I charges			-				
47	Hook-up Fees Collected ($150)		1,000	(150,000)				
48	AFUDC			48,122				
49	Balacne as of 12/31/11			971,585				
50								
51	2012 M&I charges on 2,000 AF	$ 21 /AF		42,000				
52	NP-260 Tariff M&I charges			-				
53	Hook-up Fees Collected ($150)		1,000	(150,000)				
54	AFUDC			45,001				
55	Balacne as of 12/31/12			908,586				

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Coolidge)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302			Amt. Incl. in Rate Base		Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Dec. 68302		AFUDC Rate	Activity Thru. Dec. '07
1								
2	2013 M&I charges on 2,000 AF	$ 21 /AF		42,000				
3	NP-260 Tariff M&I charges			-				
4	Hook-up Fees Collected ($150)		1,000	(150,000)				
5	AFUDC			41,719				
6	Balacne as of 12/31/13			842,305				
7								
8	2014 M&I charges on 2,000 AF	$ 21 /AF		42,000				
9	NP-260 Tariff M&I charges			-				
10	Hook-up Fees Collected ($150)		1,000	(150,000)				
11	AFUDC			38,265				
12	Balacne as of 12/31/14			772,570				
13								
14	2015 M&I charges on 2,000 AF	$ 21 /AF		42,000				
15	NP-260 Tariff M&I charges			-				
16	Hook-up Fees Collected ($150)		1,000	(150,000)				
17	AFUDC			34,631				
18	Balacne as of 12/31/15			699,201				
19								
20	2016 M&I charges on 2,000 AF	$ 21 /AF		42,000				
21	NP-260 Tariff M&I charges			-				
22	Hook-up Fees Collected ($150)		1,000	(150,000)				
23	AFUDC			30,808				
24	Balacne as of 12/31/16			622,009				
25								
26	2017 M&I charges on 2,000 AF	$ 21 /AF		42,000				
27	NP-260 Tariff M&I charges			-				
28	Hook-up Fees Collected ($150)		1,000	(150,000)				
29	AFUDC			26,785				
30	Balacne as of 12/31/17			540,794				
31								
32	2018 M&I charges on 2,000 AF	$ 21 /AF		42,000				
33	NP-260 Tariff M&I charges			-				
34	Hook-up Fees Collected ($150)		1,000	(150,000)				
35	AFUDC			22,553				
36	Balacne as of 12/31/18			455,347				
37								
38	2019 M&I charges on 2,000 AF	$ 21 /AF		42,000				
39	NP-260 Tariff M&I charges			-				
40	Hook-up Fees Collected ($150)		1,000	(150,000)				
41	AFUDC			18,100				
42	Balacne as of 12/31/19			365,447				
43								
44	2020 M&I charges on 2,000 AF	$ 21 /AF		42,000				
45	NP-260 Tariff M&I charges			-				
46	Hook-up Fees Collected ($150)		1,000	(150,000)				
47	AFUDC			13,416				
48	Balacne as of 12/31/20			270,863				
49								
50	2021 M&I charges on 2,000 AF	$ 21 /AF		42,000				
51	NP-260 Tariff M&I charges			-				
52	Hook-up Fees Collected ($150)		1,000	(150,000)				
53	AFUDC			8,487				
54	Balacne as of 12/31/21			171,350				
55								

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Pinal Valley System (Coolidge)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302			Amt. Incl. in Rate Base		Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Dec. 68302		AFUDC Rate	Activity Thru. Dec. '07
1								
2	2022 M&I charges on 2,000 AF	$ 21 /AF		42,000				
3	NP-260 Tariff M&I charges			-				
4	Hook-up Fees Collected ($150)		1,000	(150,000)				
5	AFUDC			3,301				
6	Balacne as of 12/31/22			66,651				
7								
8	2023 M&I charges on 2,000 AF	$ 21 /AF		42,000				
9	NP-260 Tariff M&I charges			-				
10	Hook-up Fees Collected ($150)		1,000	(150,000)				
11	AFUDC			(2,155)				
12	Balacne as of 12/31/23			(43,504)				
13								
14	2024 M&I charges on 2,000 AF	$ 21 /AF		42,000				
15	NP-260 Tariff M&I charges			-				
16	Hook-up Fees Collected ($150)		1,000	(150,000)				
17	AFUDC			(7,895)				
18	Balacne as of 12/31/24			(159,399)				
19								
20	2025 M&I charges on 2,000 AF	$ 21 /AF		42,000				
21	NP-260 Tariff M&I charges			-				
22	Hook-up Fees Collected ($150)		1,000	(150,000)				
23	AFUDC			(13,934)				
24	Balacne as of 12/31/25			(281,333)				
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
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JMR-3

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

White Tank System

		[A]	[B]	[C]	[D]	[E]	[F]	[G]	
		Projection Based on Dec. No. 68302			Amt. Incl. in Rate Base		Actual Activity		
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Dec. 68302		AFUDC Rate	Activity Thru. Dec. '07	
1	M&I Balance as of 12/31/2003			$ 506,268	-			$ 506,268	
2									
3	2004 M&I charges on 968 AF	$ 30 /AF		29,040				29,040	
4	NP-260 Tariff M&I charges			-				-	
5	AFUDC			29,408			5.09%	26,726	
6	Balacne as of 12/31/04			564,716				562,034	
7									
8	2005 M&I charges on 968 AF	$ 28 /AF		27,104				25,168	
9	NP-260 Tariff M&I charges			-				-	
10	AFUDC			30,840			9.05%	53,034	
11	Balacne as of 12/31/05			622,660				640,236	
12									
13	2006 M&I charges on 968 AF	$ 24 /AF		23,232				21,780	
14	NP-260 Tariff M&I charges			-				-	
15	Hook-up Fees Collected ($500)		141	(70,500)				(29,000)	
16	Interest Earned on CAP Chgs. Pd. from '87 - '94			-				(4,730)	
17	AFUDC			29,984			8.62%	56,370	
18	Balacne as of 12/31/06			605,376				684,656	
19									
20	2007 M&I charges on 968 AF	$ 21 /AF		20,328				20,328	
21	NP-260 Tariff M&I charges			-				-	
22	Hook-up Fees Collected ($500)		153	(76,500)				(542,838)	
23	AFUDC			28,619			7.09%	31,008	
24									
25	Balacne as of 12/31/07			577,823				193,154	
26									
27	2008 M&I charges on 968 AF	$ 21 /AF		20,328				18,876	
28	NP-260 Tariff M&I charges			-				-	
29	Hook-up Fees Collected ($500)		153	(76,500)				(94,667)	
30	AFUDC			27,183				14,310	
31	Balacne as of 12/31/08			548,834			7.09%	131,673	
32									
33	2009 M&I charges on 968 AF	$ 21 /AF		20,328				15,972	
34	NP-260 Tariff M&I charges			-				-	
35	Hook-up Fees Collected ($500)		153	(76,500)				131,669	(Refund of Hook-up fees to Pulte)
36	AFUDC			25,673				14,252	
37	Balacne as of 12/31/09			518,335			7.09%	293,566	
38									
39	2010 M&I charges on 968 AF	$ 21 /AF		20,328					
40	NP-260 Tariff M&I charges			-					
41	Hook-up Fees Collected ($500)		153	(76,500)					
42	AFUDC			24,083					
43	Balacne as of 12/31/10			486,246					
44									
45	2011 M&I charges on 968 AF	$ 21 /AF		20,328					
46	NP-260 Tariff M&I charges			-					
47	Hook-up Fees Collected ($500)		153	(76,500)					
48	AFUDC			22,411					
49	Balacne as of 12/31/11			452,485					
50									
51	2012 M&I charges on 968 AF	$ 21 /AF		20,328					
52	NP-260 Tariff M&I charges			-					
53	Hook-up Fees Collected ($500)		153	(76,500)					
54	AFUDC			20,652					
55	Balacne as of 12/31/12			416,965					

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

White Tank System

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302			Amt. Incl. in		Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Rate Base Dec. 68302		AFUDC Rate	Activity Thru. Dec. '07
1								
2	2013 M&I charges on 968 AF	$ 21 /AF		20,328				
3	NP-260 Tariff M&I charges			-				
4	Hook-up Fees Collected ($500)		153	(76,500)				
5	AFUDC			18,801				
6	Balacne as of 12/31/13			379,594				
7								
8	2014 M&I charges on 968 AF	$ 21 /AF		20,328				
9	NP-260 Tariff M&I charges			-				
10	Hook-up Fees Collected ($500)		153	(76,500)				
11	AFUDC			16,854				
12	Balacne as of 12/31/14			340,276				
13								
14	2015 M&I charges on 968 AF	$ 21 /AF		20,328				
15	NP-260 Tariff M&I charges			-				
16	Hook-up Fees Collected ($500)		153	(76,500)				
17	AFUDC			14,805				
18	Balacne as of 12/31/15			298,909				
19								
20	2016 M&I charges on 968 AF	$ 21 /AF		20,328				
21	NP-260 Tariff M&I charges			-				
22	Hook-up Fees Collected ($500)		153	(76,500)				
23	AFUDC			12,649				
24	Balacne as of 12/31/16			255,386				
25								
26	2017 M&I charges on 968 AF	$ 21 /AF		20,328				
27	NP-260 Tariff M&I charges			-				
28	Hook-up Fees Collected ($500)		153	(76,500)				
29	AFUDC			10,381				
30	Balacne as of 12/31/17			209,595				
31								
32	2018 M&I charges on 968 AF	$ 21 /AF		20,328				
33	NP-260 Tariff M&I charges			-				
34	Hook-up Fees Collected ($500)		153	(76,500)				
35	AFUDC			7,995				
36	Balacne as of 12/31/18			161,418				
37								
38	2019 M&I charges on 968 AF	$ 21 /AF		20,328				
39	NP-260 Tariff M&I charges			-				
40	Hook-up Fees Collected ($500)		153	(76,500)				
41	AFUDC			5,484				
42	Balacne as of 12/31/19			110,730				
43								
44	2020 M&I charges on 968 AF	$ 21 /AF		20,328				
45	NP-260 Tariff M&I charges			-				
46	Hook-up Fees Collected ($500)		153	(76,500)				
47	AFUDC			2,843				
48	Balacne as of 12/31/20			57,401				
49								
50	2021 M&I charges on 968 AF	$ 21 /AF		20,328				
51	NP-260 Tariff M&I charges			-				
52	Hook-up Fees Collected ($500)		153	(76,500)				
53	AFUDC			64				
54	Balacne as of 12/31/21			1,293				
55								

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

White Tank System

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302			Amt. Incl. in		Actual Activity	
Line			Customer		Rate Base		AFUDC	Activity
No.	Description	Cost/AF	Growth	$ Amount	Dec. 68302		Rate	Thru. Dec. '07
1								
2	2022 M&I charges on 968 AF	$ 21 /AF		20,328				
3	NP-260 Tariff M&I charges			-				
4	Hook-up Fees Collected ($500)		153	(76,500)				
5	AFUDC			(2,860)				
6	Balacne as of 12/31/22			(57,739)				
7								
8	2023 M&I charges on 968 AF	$ 21 /AF		20,328				
9	NP-260 Tariff M&I charges			-				
10	Hook-up Fees Collected ($500)		153	(76,500)				
11	AFUDC			(5,936)				
12	Balacne as of 12/31/23			(119,847)				
13								
14	2024 M&I charges on 968 AF	$ 21 /AF		20,328				
15	NP-260 Tariff M&I charges			-				
16	Hook-up Fees Collected ($500)		153	(76,500)				
17	AFUDC			(9,172)				
18	Balacne as of 12/31/24			(185,191)				
19								
20	2025 M&I charges on 968 AF	$ 21 /AF		20,328				
21	NP-260 Tariff M&I charges			-				
22	Hook-up Fees Collected ($500)		153	(76,500)				
23	AFUDC			(12,577)				
24	Balacne as of 12/31/25			(253,940)				
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JMR-4

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Proposed - Pinal Valley (Casa Grande, Coolidge, White Tank)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]
		Projection Based on Dec. No. 68302					Actual Activity	
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07
1	M&I Balance as of 12/31/2003			$ 4,935,186				$ 5,078,082
2	Less: Amount Included in Rate Base - Dec. 68302				$ 142,896	279 AF[1]		(142,896)
3	2004 M&I charges on 11,573 AF	$ 30 /AF		347,190				355,560
4	NP-260 Tariff M&I charges			(98,370)				(98,371)
5	AFUDC			279,534			5.09%	268,360
6	Balacne as of 12/31/04			5,463,540				5,460,735
7								
8	2005 M&I charges on 11,573 AF	$ 28 /AF		324,044				308,152
9	NP-260 Tariff M&I charges			(63,812)				(87,372)
10	AFUDC			306,556			9.05%	529,000
11	Balacne as of 12/31/05			6,030,328				6,210,515
12								
13	2006 M&I charges on 11,573 AF	$ 24 /AF		277,752				266,670
14	NP-260 Tariff M&I charges			(54,696)				(76,340)
15	Hook-up Fees Collected		3,127	(633,588)				(1,748,229)
16	Interest Earned on CAP Chgs. Pd. from '87 - '94			-				(57,980)
17	AFUDC			292,848			8.62%	536,092
18	Balacne as of 12/31/06			5,912,644				5,130,728
19								
20	2007 M&I charges on 11,573 AF	$ 21 /AF		243,033				248,892
21	NP-260 Tariff M&I charges			(47,859)				(67,608)
22	Hook-up Fees Collected		3,355	(684,516)				(1,325,020)
23	AFUDC			282,608			7.09%	347,502
24	Less: Amount Included in Rate Base - Dec. 71845			-	$ 447,196	1,003 AF[2]		(447,196)
25	Balacne as of 12/31/07			5,705,910				3,887,298
26								
27	2008 M&I charges on 10,570 AF	$ 21 /AF		243,033				231,114
28	NP-260 Tariff M&I charges			(47,859)				(60,683)
29	Hook-up Fees Collected		3,355	(684,516)				(299,872)
30	AFUDC			271,835				325,168
31	Balacne as of 12/31/08			5,488,403			7.09%	4,083,025
32								
33	2009 M&I charges on 10,570 AF	$ 21 /AF		243,033				195,558
34	NP-260 Tariff M&I charges			(47,859)				(51,487)
35	Hook-up Fees Collected		3,355	(684,516)				87,890
36	AFUDC			260,501				336,698
37	Balacne as of 12/31/09			5,259,562			7.09%	4,651,683
38								
39	2010 M&I charges on 10,570 AF	$ 21 /AF		243,033				
40	NP-260 Tariff M&I charges			(47,859)				
41	Hook-up Fees Collected		3,355	(684,516)				
42	AFUDC			248,575				
43	Balacne as of 12/31/10			5,018,795				
44								
45	2011 M&I charges on 10,570 AF	$ 21 /AF		243,033				
46	NP-260 Tariff M&I charges			(47,859)				
47	Hook-up Fees Collected		3,355	(684,516)				
48	AFUDC			236,030				
49	Balacne as of 12/31/11			4,765,483				
50								
51	2012 M&I charges on 10,570 AF	$ 21 /AF		243,033				
52	NP-260 Tariff M&I charges			(47,859)				
53	Hook-up Fees Collected		3,355	(684,516)				
54	AFUDC			222,829				
55	Balacne as of 12/31/12			4,498,970				

[H]

Proposed Pinal Valley CAP Hook-up Fee ([Col. C ÷ Col. F] x -1): $204

Proposed Fee by Meter Size	
Meter Size	Fee
5/8" X 3/4"	$204
3/4"	$204
1"	$204
1-1/2"	$714
2"	$1,142
3"	$2,305
4"	$3,590
6" or Larger	$7,191

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Proposed - Pinal Valley (Casa Grande, Coolidge, White Tank)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
		Projection Based on Dec. No. 68302					Actual Activity		
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07	
1									
2	2013 M&I charges on 10,570 AF	$ 21 /AF		243,033					
3	NP-260 Tariff M&I charges			(47,859)					
4	Hook-up Fees Collected		3,355	(684,516)					
5	AFUDC			208,942					
6	Balacne as of 12/31/13			4,218,570					
7									
8	2014 M&I charges on 10,570 AF	$ 21 /AF		243,033					
9	NP-260 Tariff M&I charges			(47,859)					
10	Hook-up Fees Collected		3,355	(684,516)					
11	AFUDC			194,331					
12	Balacne as of 12/31/14			3,923,559					
13									
14	2015 M&I charges on 10,570 AF	$ 21 /AF		243,033					
15	NP-260 Tariff M&I charges			(47,859)					
16	Hook-up Fees Collected		3,355	(684,516)					
17	AFUDC			178,958					
18	Balacne as of 12/31/15			3,613,175					
19									
20	2016 M&I charges on 10,570 AF	$ 21 /AF		243,033					
21	NP-260 Tariff M&I charges			(47,859)					
22	Hook-up Fees Collected		3,355	(684,516)					
23	AFUDC			162,783					
24	Balacne as of 12/31/16			3,286,616					
25									
26	2017 M&I charges on 10,570 AF	$ 21 /AF		243,033					
27	NP-260 Tariff M&I charges			(47,859)					
28	Hook-up Fees Collected		3,355	(684,516)					
29	AFUDC			145,766					
30	Balacne as of 12/31/17			2,943,040					
31									
32	2018 M&I charges on 10,570 AF	$ 21 /AF		243,033					
33	NP-260 Tariff M&I charges			(47,859)					
34	Hook-up Fees Collected		3,355	(684,516)					
35	AFUDC			127,862					
36	Balacne as of 12/31/18			2,581,560					
37									
38	2019 M&I charges on 10,570 AF	$ 21 /AF		243,033					
39	NP-260 Tariff M&I charges			(47,859)					
40	Hook-up Fees Collected		3,355	(684,516)					
41	AFUDC			109,025					
42	Balacne as of 12/31/19			2,201,243					
43									
44	2020 M&I charges on 10,570 AF	$ 21 /AF		243,033					
45	NP-260 Tariff M&I charges			(47,859)					
46	Hook-up Fees Collected		3,355	(684,516)					
47	AFUDC			89,208					
48	Balacne as of 12/31/20			1,801,109					
49									
50	2021 M&I charges on 10,570 AF	$ 21 /AF		243,033					
51	NP-260 Tariff M&I charges			(47,859)					
52	Hook-up Fees Collected		3,355	(684,516)					
53	AFUDC			68,356					
54	Balacne as of 12/31/21			1,380,123					
55									

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Central Arizona Project ("CAP") Hook-up Fee & and Municipal & Industrial ("M&I") use Charge True-up

Proposed - Pinal Valley (Casa Grande, Coolidge, White Tank)

		[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]
		Projection Based on Dec. No. 68302					Actual Activity		
Line No.	Description	Cost/AF	Customer Growth	$ Amount	Amt. Incl. in Rate Base		AFUDC Rate	Activity Thru. Dec. '07	
1									
2	2022 M&I charges on 10,570 AF	$ 21 /AF		243,033					
3	NP-260 Tariff M&I charges			(47,859)					
4	Hook-up Fees Collected		3,355	(684,516)					
5	AFUDC			46,418					
6	Balacne as of 12/31/22			937,199					
7									
8	2023 M&I charges on 10,570 AF	$ 21 /AF		243,033					
9	NP-260 Tariff M&I charges			(47,859)					
10	Hook-up Fees Collected		3,355	(684,516)					
11	AFUDC			23,337					
12	Balacne as of 12/31/23			471,194					
13									
14	2024 M&I charges on 10,570 AF	$ 21 /AF		243,033					
15	NP-260 Tariff M&I charges			(47,859)					
16	Hook-up Fees Collected		3,355	(684,516)					
17	AFUDC			(945)					
18	Balacne as of 12/31/24			(19,093)					
19									
20	2025 M&I charges on 10,570 AF	$ 21 /AF		243,033					
21	NP-260 Tariff M&I charges			(47,859)					
22	Hook-up Fees Collected		3,355	(684,516)					
23	AFUDC			(26,494)					
24	Balacne as of 12/31/25			(534,929)					
25									
26									
27									
28									
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50 [1]During T.Y. 2003 279 AF of untreated CAP Water were sold to golf courses who were not contractually obligated to reimburse the Company for a portion of previously deferred M&I charges.
51 Per Dec. 68302 this 279 AF was deemed used & useful, therefore, (279/(8,884-2,000)=4.0529% X $3,525,803) = $142,896 in previously deferred M&I charges was included in rate base
52 to be amortized to expense over 20 years.
53 [2]During T.Y. 2007 1,003 AF of untreated CAP water were sold to golf courses who were not contractually obligated to reimburse the Company for a portion of previously deferred M&I charges.
54 Per Dec. 71845 this 1,003 was deemed used & useful, therefore, (1,003/(8,884 - 2,000) = 14.57% X $3,069,295 = $447,196 in previously deferred M&I charges was included in rate base
55 to be amortized to expense over 20 years.

JMR-5

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

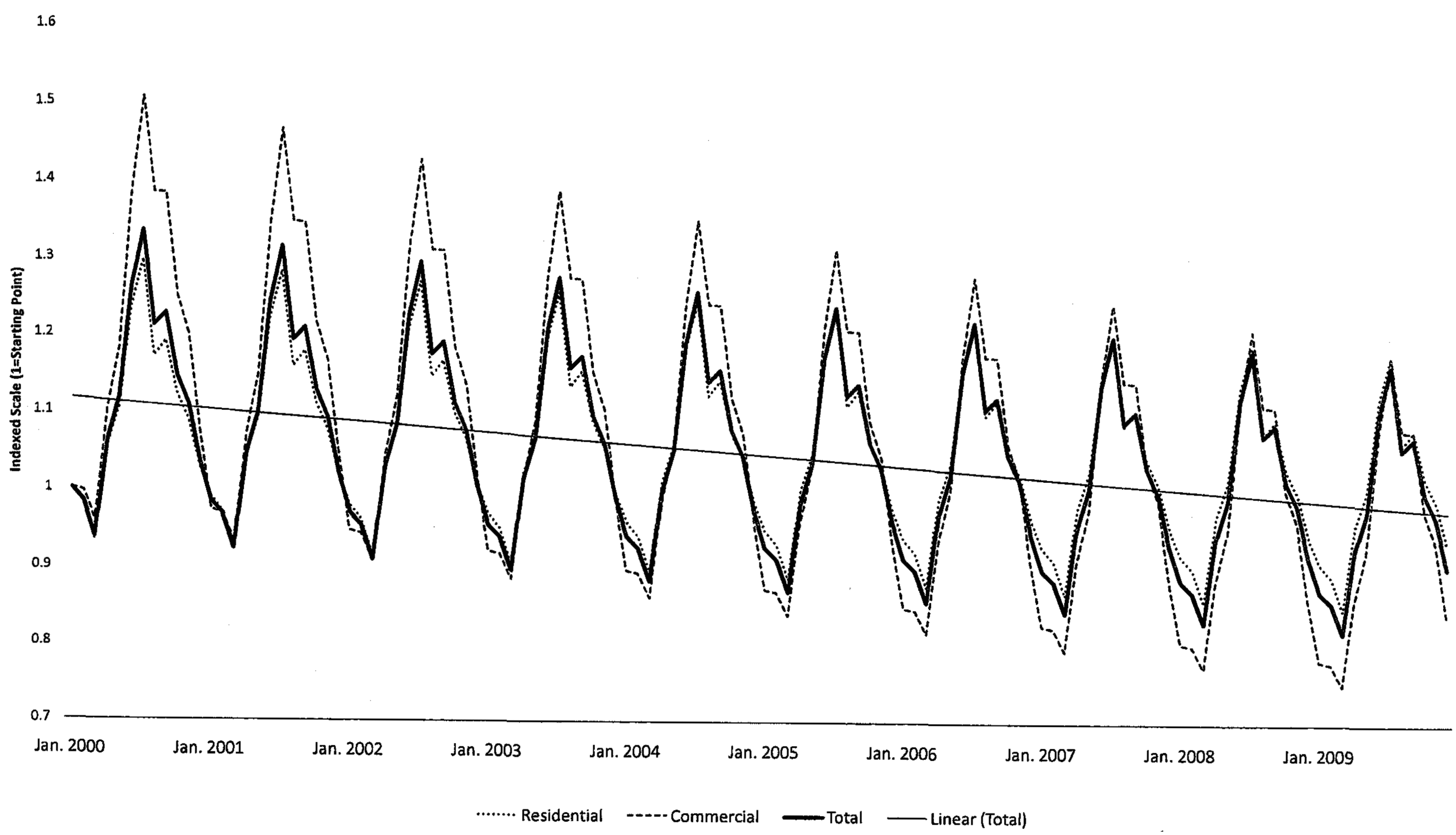
SUMMARY RESULTS FOR REGRESSION COEFFICIENT b_4 - ESTIMATED MONTHLY GROWTH IN M GALLONS USED PER CUSTOMER (JAN. 2000 TO DEC. 2009)

	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
	PANEL A: Regression Coefficient b_4 (slope of the coded month)						PANEL B: Regression Coefficent $\hat{B}_4$ (antilog of b_4)					
	Residential		Commercial		Total		Residential		Commercial		Total	
	b_4	*t Stat*	b_4	*t Stat*	b_4	*t Stat*	$\hat{B}_4$	*t Stat*	$\hat{B}_4$	*t Stat*	$\hat{B}_4$	*t Stat*
Superstition	-0.00039	-5.86	-0.00100	-11.46	-0.00055	-8.51	0.99910	-5.86	0.99771	-11.46	0.99873	-8.51
Cochise	-0.00105	-11.09	0.00100	9.35	-0.00056	-6.63	0.99760	-11.09	1.00230	9.35	0.99871	-6.63
San Manuel/Oracle/Winkelman	-0.00122	-13.49	-0.00018	-0.94	-0.00098	-10.00	0.99719	-13.49	0.99958	-0.94	0.99775	-10.00
Eastern Group	-0.00058	-9.65	-0.00049	-6.53	-0.00059	-9.939	0.99866	-9.65	0.99888	-6.53	0.99865	-9.94
Pinal Valley/Stanfield	-0.00140	-18.91	0.00041	3.97	-0.00116	-14.59	0.99679	-18.91	1.00094	3.97	0.99734	-14.59
Ajo	-0.00060	-5.52	-0.00032	-2.50	-0.00058	-5.87	0.99861	-5.52	0.99927	-2.50	0.99867	-5.87
White Tank	0.00089	7.99	0.00096	2.96	0.00109	9.45	1.00204	7.99	1.00222	2.96	1.00251	9.45
Western Group	-0.00114	-16.08	0.00051	5.03	-0.00092	-12.26	0.99739	-16.08	1.00118	5.03	0.99788	-12.26
Navajo	0.00006	0.47	0.00014	1.09	0.00007	0.61	1.00013	0.47	1.00033	1.09	1.00016	0.61
Sedona/Verde Valley	-0.00006	-0.69	0.00013	1.77	0.00002	0.20	0.99985	-0.69	1.00031	1.77	1.00004	0.20
Northern Group	-0.00005	-0.57	0.000111	1.48	-0.00001	-0.11	0.99989	-0.57	1.00026	1.48	0.99998	-0.11
Total Company	-0.00047	-7.61	0.00018	2.59	-0.00038	-6.17	0.99892	-7.61	1.00041	2.59	0.99913	-6.17

	PANEL C: Estimated Monthly Growth In Usage Per Customer (r) $(\hat{B}_4 - 1) \times 100$ %						PANEL D: Estimated Annual Growth in Usage Per Customer (APR) $(1 + r)^{12} - 1$					
	Residential		Commercial		Total		Residential		Commercial		Total	
	r	*t Stat*	r	*t Stat*	r	*t Stat*	*APR*	*t Stat*	*APR*	*t Stat*	*APR*	*t Stat*
Superstition	-0.090%	-5.86	-0.229%	-11.46	-0.127%	-8.51	-1.069%	-5.86	-2.712%	-11.46	-1.509%	-8.51
Cochise	-0.240%	-11.09	0.230%	9.35	-0.129%	-6.63	-2.848%	-11.09	2.790%	9.35	-1.536%	-6.63
San Manuel/Oracle/Winkelman	-0.281%	-13.49	-0.042%	-0.94	-0.225%	-10.00	-3.318%	-13.49	-0.502%	-0.94	-2.664%	-10.00
Eastern Group	-0.134%	-9.65	-0.112%	-6.53	-0.135%	-9.94	-1.592%	-9.65	-1.332%	-6.53	-1.609%	-9.94
Pinal Valley/Stanfield	-0.321%	-18.91	0.094%	3.97	-0.266%	-14.59	-3.786%	-18.91	1.130%	3.97	-3.143%	-14.59
Ajo	-0.139%	-5.52	-0.073%	-2.50	-0.133%	-5.87	-1.650%	-5.52	-0.874%	-2.50	-1.581%	-5.87
White Tank	0.204%	7.99	0.222%	2.96	0.251%	9.45	2.478%	7.99	2.702%	2.96	3.053%	9.45
Western Group	-0.261%	-16.08	0.118%	5.03	-0.212%	-12.26	-3.089%	-16.08	1.428%	5.03	-2.520%	-12.26
Navajo	0.013%	0.47	0.033%	1.09	0.016%	0.61	0.161%	0.47	0.395%	1.09	0.190%	0.61
Sedona/Verde Valley	-0.015%	-0.69	0.031%	1.77	0.004%	0.20	-0.176%	-0.69	0.368%	1.77	0.046%	0.20
Northern Group	-0.011%	-0.57	0.026%	1.48	-0.002%	-0.11	-0.136%	-0.57	0.307%	1.48	-0.024%	-0.11
Total Company	-0.108%	-7.61	0.041%	2.59	-0.087%	-6.17	-1.289%	-7.61	0.492%	2.59	-1.040%	-6.17

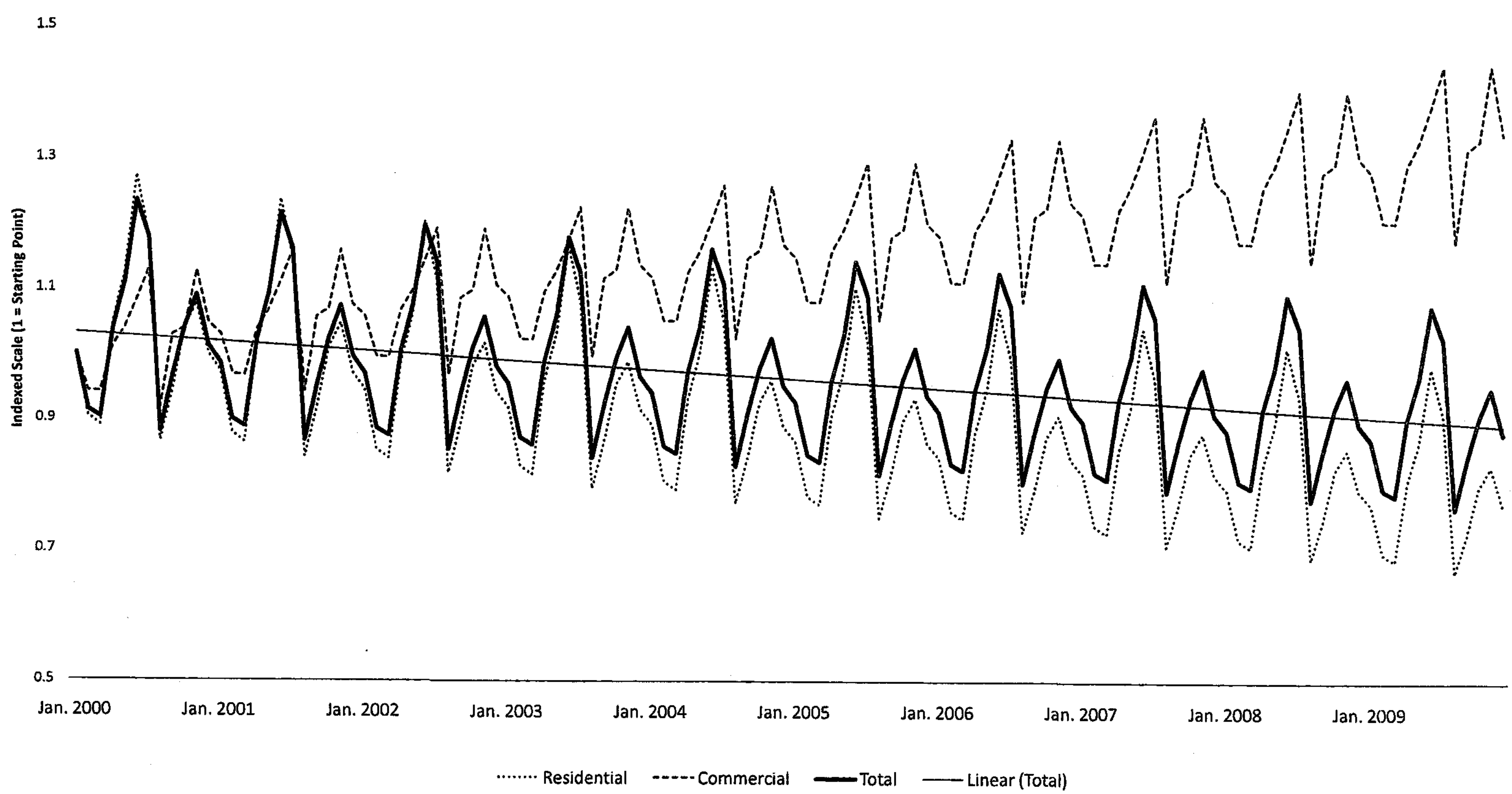
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

SUPERSTITION
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



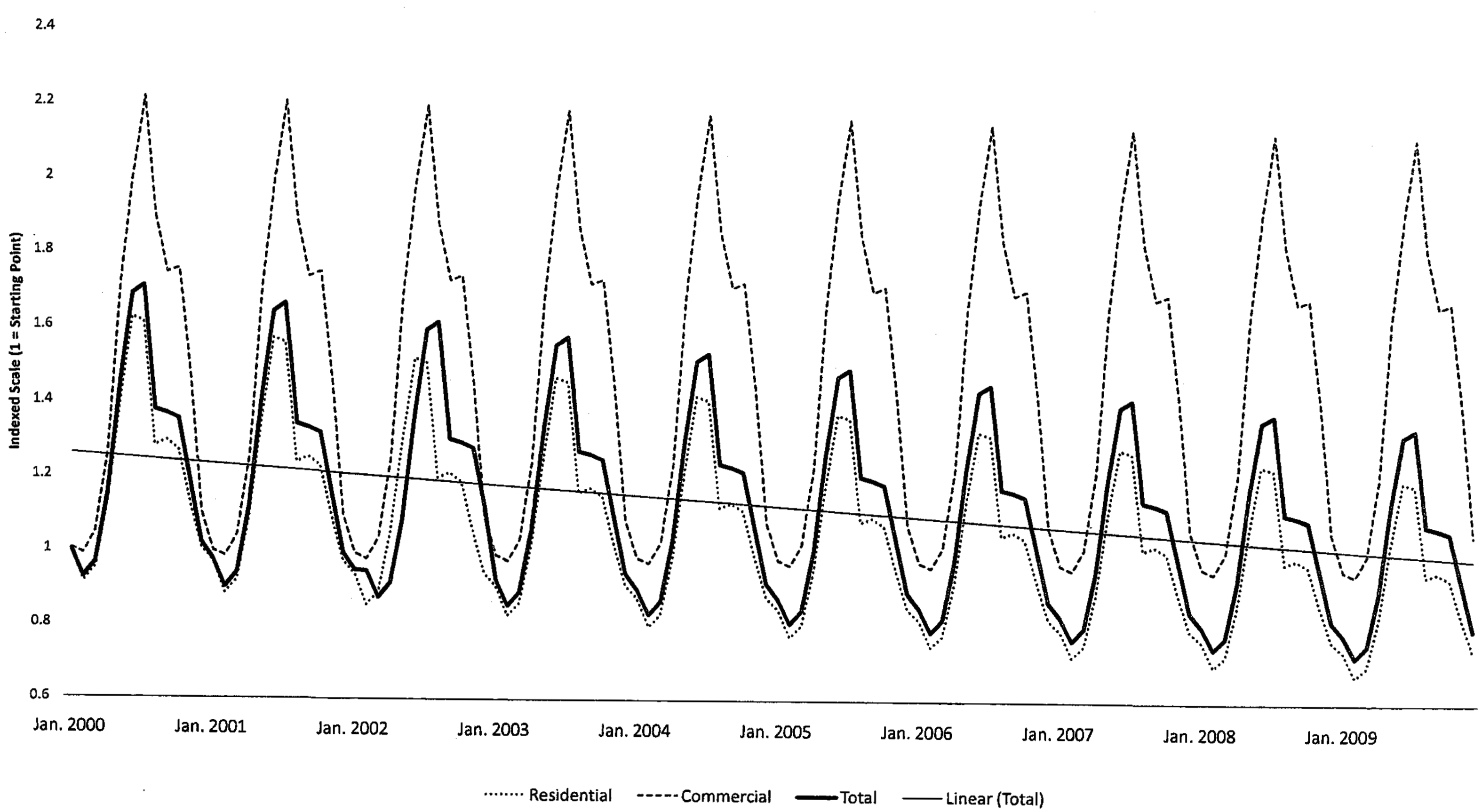
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

COCHISE
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



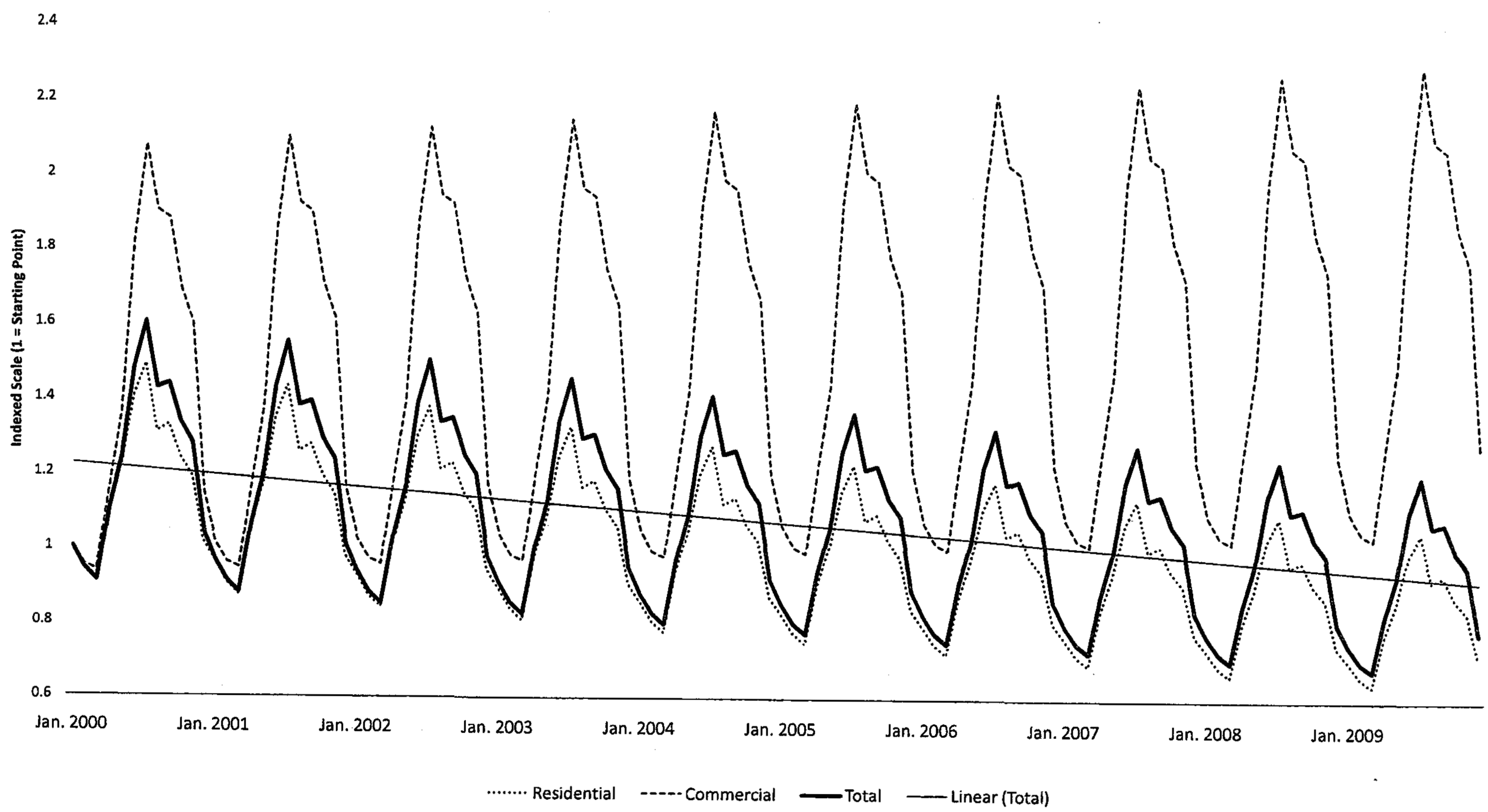
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

SAN MANUEL/ORACLE/WINKELMAN
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



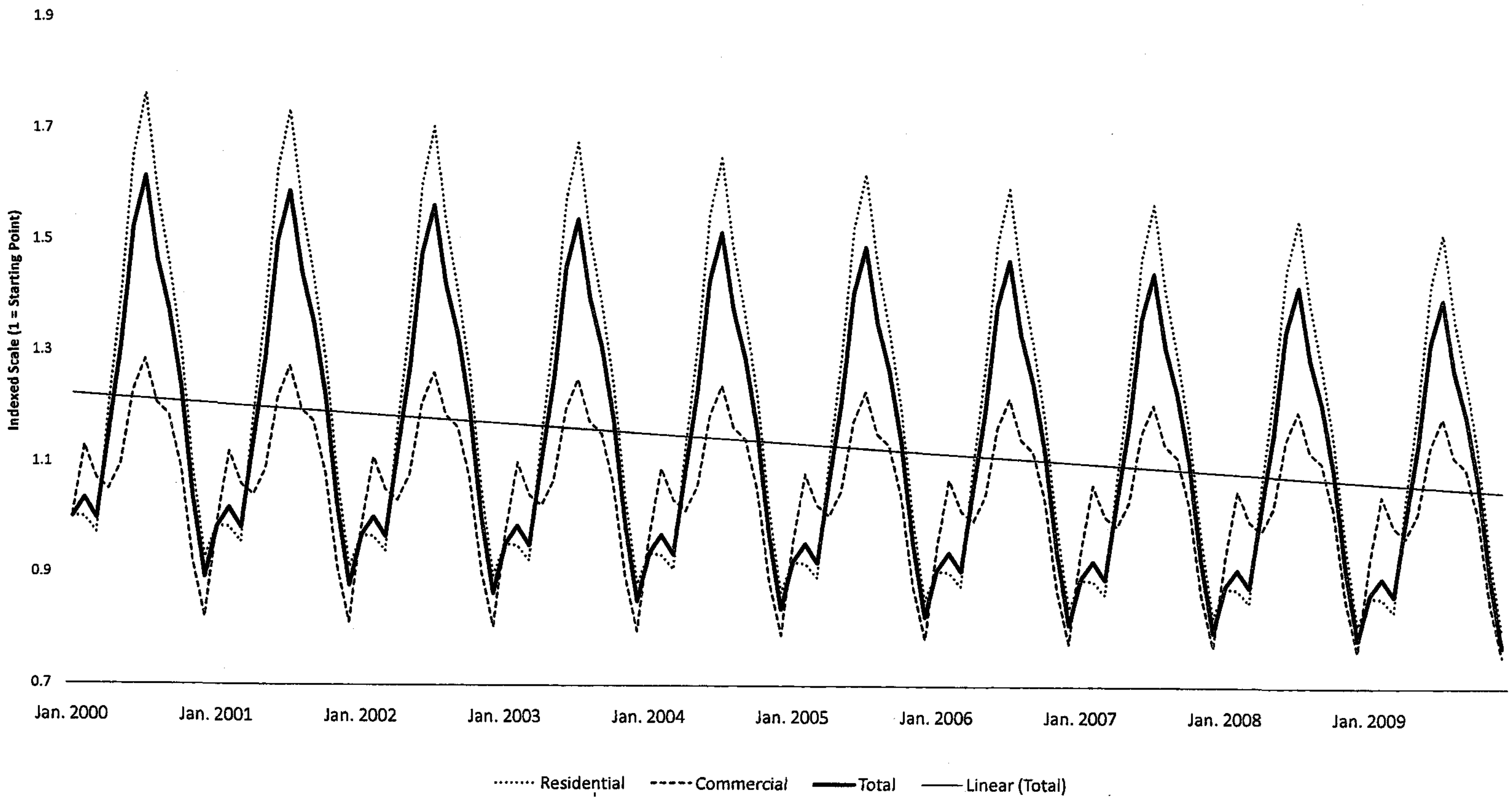
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

PINAL VALLEY/STANFIELD
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



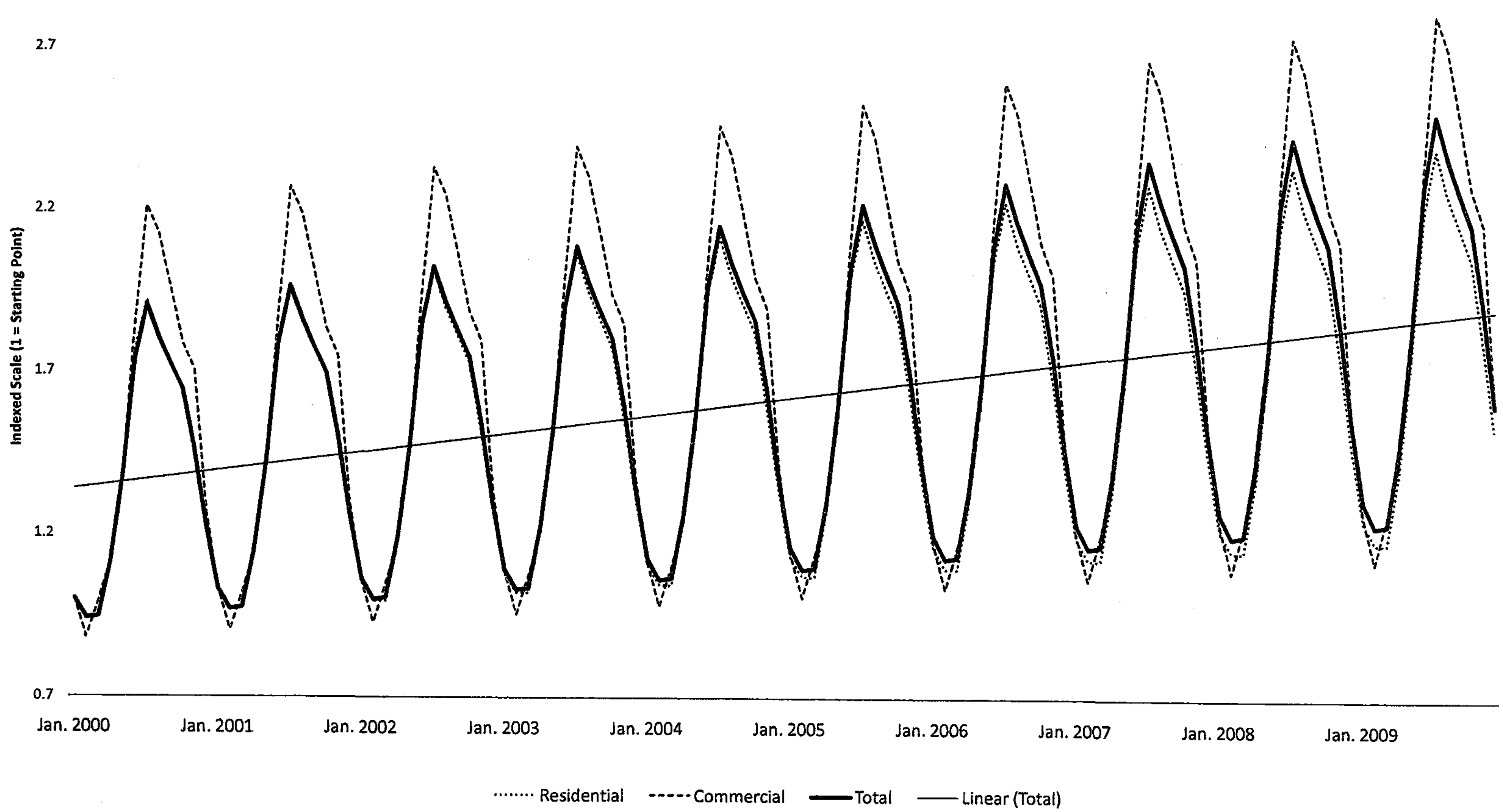
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

AJO
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



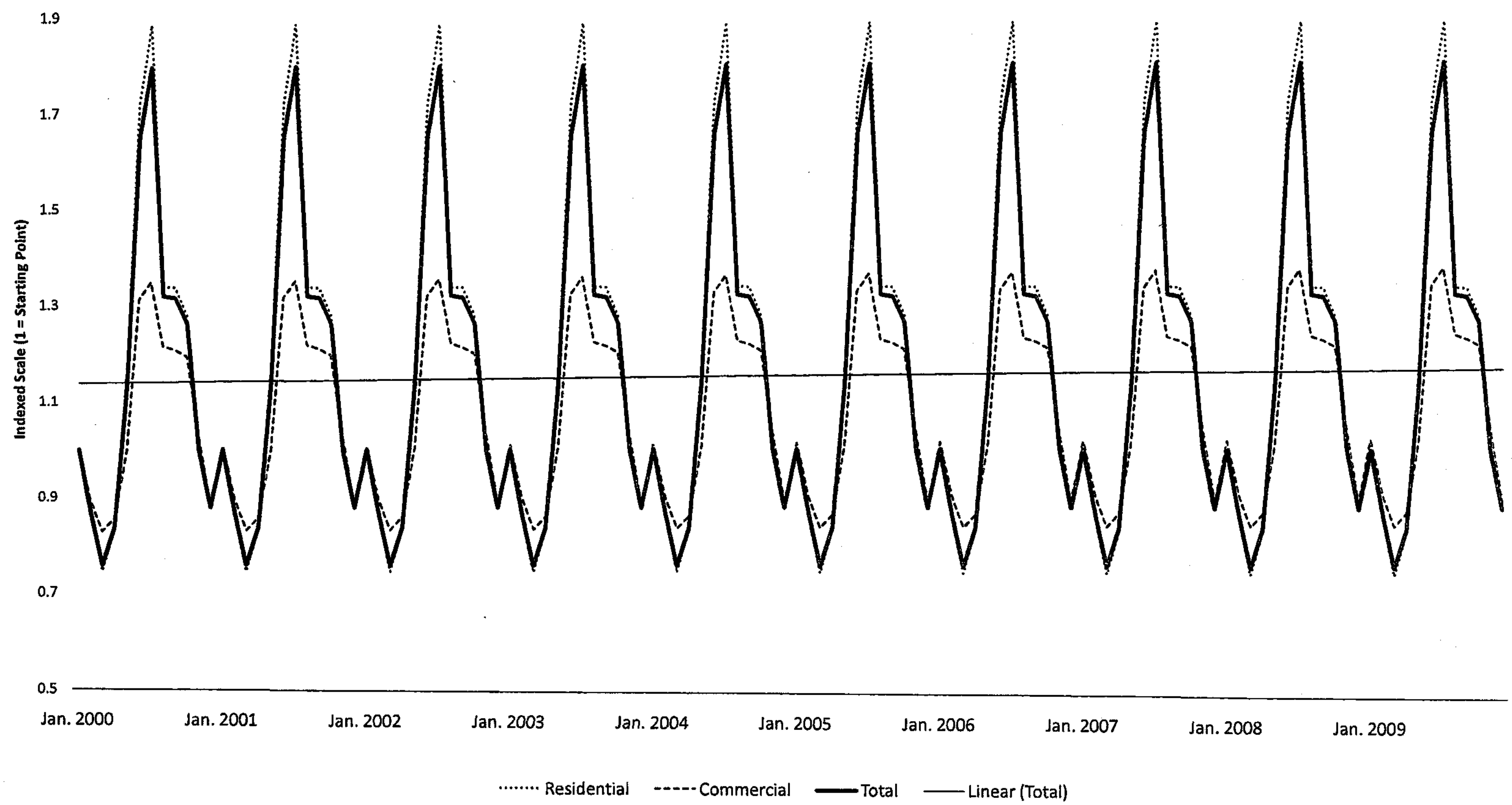
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

WHITE TANK
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



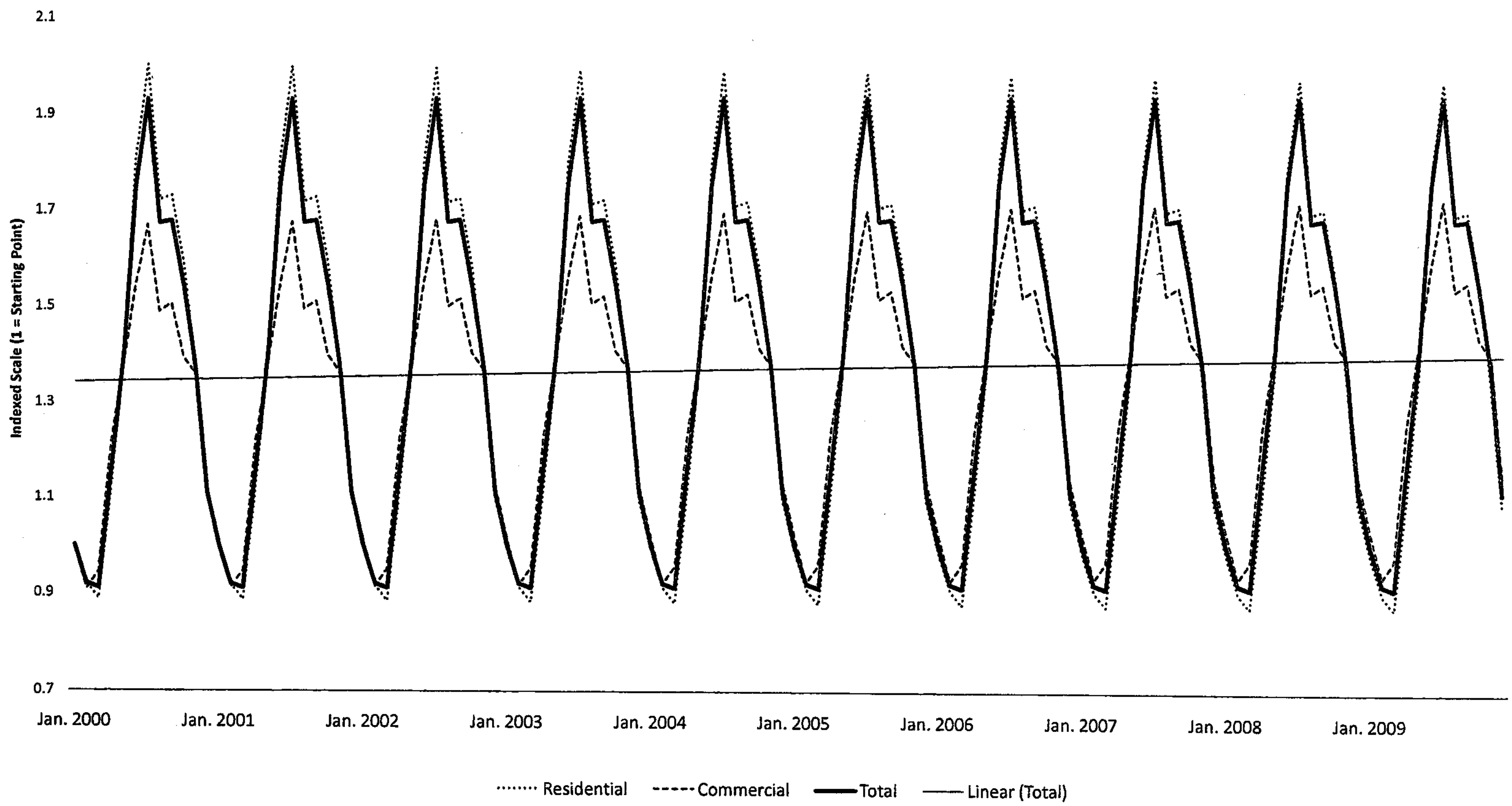
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

NAVAJO
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



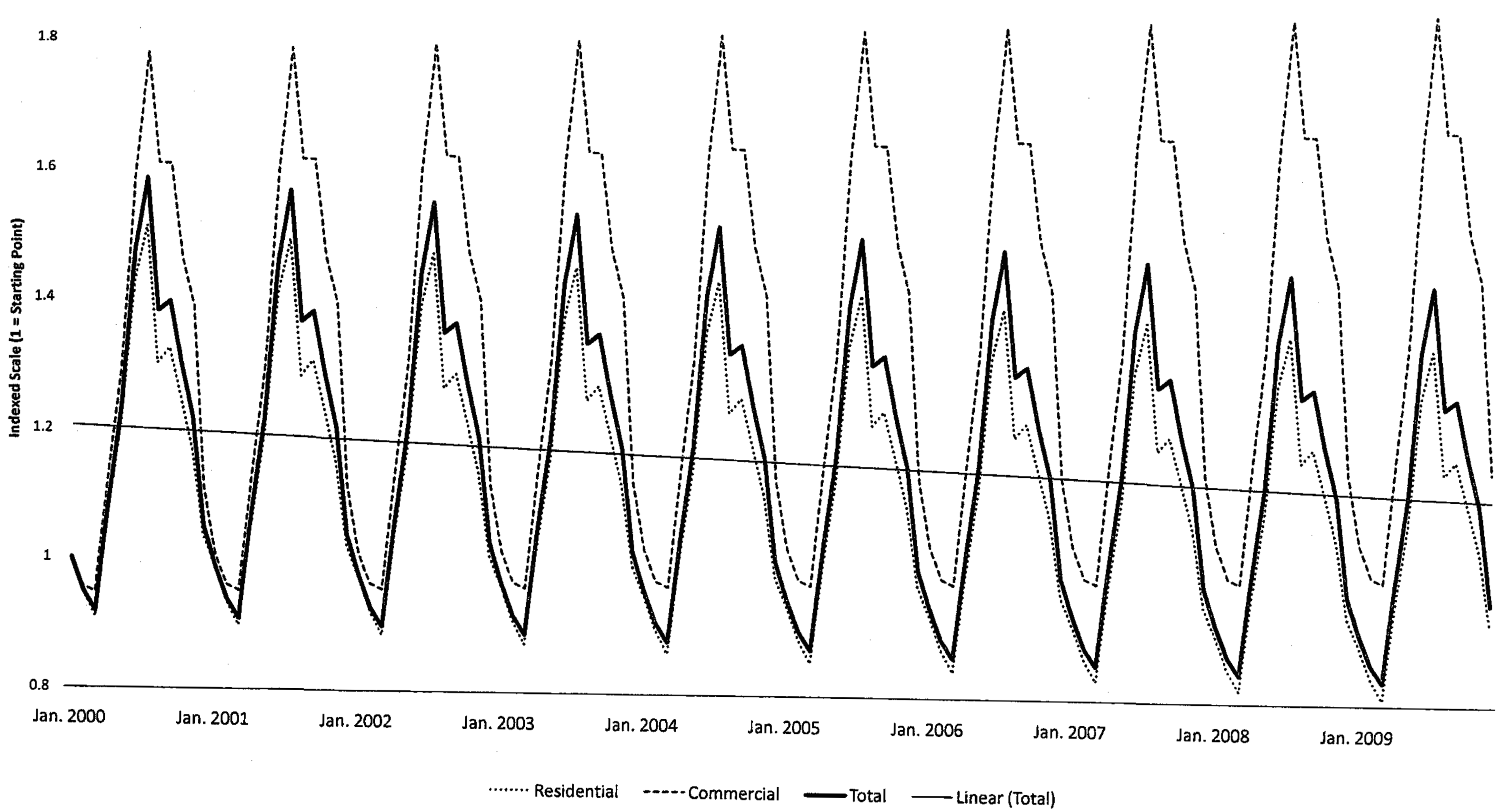
MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

SEDONA/VERDE VALLEY
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

TOTAL COMPANY
Indexed Average Usage Per Customer While Controlling for Weather Conditions
(Trendline Represents Total Residential & Commercial)



MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

DATA USED IN MODEL:

DEPENDENT VARIABLE log(Y): log10ofResMGals, log10ofComMGals, log10ofTotMGals (base-10 logarithm of monthly average usage per residential, commercial, and total customers in M gallons)
INDEPENDENT VARIABLE X_1: AvgTemp (monthly average temperature in degress Fahrenheit from the National Climatic Data Center, U.S. Dept. of Commerce)
INDEPENDENT VARIABLE X_2: TotPrecip (monthly total precipitation in inches from the National Climatic Data Center, U.S. Dept. of Commerce)
INDEPENDENT VARIABLE X_3: PDSI (monthly Palmer Drought Severity Index ranging from -6 to +6, with negative values denoting dry spells, from the National Climatic Data Center, U.S. Dept. of Commerce)
INDEPENDENT VARIABLE X_4: CodedMonth (coded monthly value, x_{4i} = 0, 1, 2,...)
INDEPENDENT VARIABLE M_2: FEB (categorical predictor variable for February; 1 if February, 0 if not February)
INDEPENDENT VARIABLE M_3: MAR (categorical predictor variable for March; 1 if March, 0 if not March)
INDEPENDENT VARIABLE M_4: APR (categorical predictor variable for April; 1 if April, 0 if not April)
INDEPENDENT VARIABLE M_5: MAY (categorical predictor variable for May; 1 if May, 0 if not May)
INDEPENDENT VARIABLE M_6: JUN (categorical predictor variable for June; 1 if June, 0 if not June)
INDEPENDENT VARIABLE M_7: JUL (categorical predictor variable for July; 1 if July, 0 if not July)
INDEPENDENT VARIABLE M_8: AUG (categorical predictor variable for August; 1 if August, 0 if not August)
INDEPENDENT VARIABLE M_9: SEP (categorical predictor variable for September; 1 if September, 0 if not September)
INDEPENDENT VARIABLE M_{10}: OCT (categorical predictor variable for October; 1 if October, 0 if not October)
INDEPENDENT VARIABLE M_{11}: NOV (categorical predictor variable for November; 1 if November, 0 if not November)
INDEPENDENT VARIABLE M_{12}: DEC (categorical predictor variable for December; 1 if December, 0 if not December)

FORECASTING EQUATION:

$$\log\left(\hat{Y}_i\right) = b_0 + b_1X_{1_i} + b_2X_{2_i} + b_3X_{3_i} + b_4X_{4_i} + b_5M_2 + b_6M_3 + b_7M_4 + b_8M_5 + b_9M_6 + b_{10}M_7 + b_{11}M_8 + b_{12}M_9 + b_{13}M_{10} + b_{14}M_{11} + b_{15}M_{12}$$

where b_0 = estimate of $\log(\mathrm{B}_0)$ and, thus, $10^{b_0} = \hat{\mathrm{B}}_0$

b_1 = estimate of $\log(\mathrm{B}_1)$ and, thus, $10^{b_1} = \hat{\mathrm{B}}_1$

b_2 = estimate of $\log(\mathrm{B}_2)$ and, thus, $10^{b_2} = \hat{\mathrm{B}}_2$

b_3 = estimate of $\log(\mathrm{B}_3)$ and, thus, $10^{b_3} = \hat{\mathrm{B}}_3$

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b_{15} = estimate of $\log(\mathrm{B}_{15})$ and, thus, $10^{b_{15}} = \hat{\mathrm{B}}_{15}$

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Superstition Residential 2000-2009

Regression Statistics	
Multiple R	0.943085651
R Square	0.889410546
Adjusted R Square	0.873460143
Standard Error	0.024815087
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.515054886	0.034336992	55.76101096	1.061281E-42
Residual	104	0.06404201	0.000615789		
Total	119	0.579096896			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.784308579	0.060655546	12.93053357	2.23703E-23	0.664026357	0.9045908	0.664026357	0.9045908
AvgTemp b_1	0.001642795	0.001123414	1.46232365	0.146667891	-0.000584977	0.003870568	-0.000584977	0.003870568
TotPrecip b_2	0.005699611	0.003448011	1.653014107	0.101343745	-0.001137924	0.012537145	-0.001137924	0.012537145
PDSI b_3	-0.004979994	0.001106814	-4.499394758	1.78108E-05	-0.007174848	-0.00278514	-0.007174848	-0.00278514
CodedMonth b_4	-0.000388905	6.63195E-05	-5.864115033	5.39189E-08	-0.000520419	-0.000257391	-0.000520419	-0.000257391
FEB b_5	-0.007847739	0.011447252	-0.685556548	0.494518118	-0.030548068	0.014852591	-0.030548068	0.014852591
MAR b_6	-0.028989054	0.014515275	-1.997141247	0.048422045	-0.057773387	-0.00020472	-0.057773387	-0.00020472
APR b_7	0.024668714	0.020182313	1.222293668	0.224359559	-0.01535357	0.064690997	-0.01535357	0.064690997
MAY b_8	0.044784764	0.030434511	1.471512534	0.144172067	-0.015568011	0.105137539	-0.015568011	0.105137539
JUN b_9	0.09358884	0.038905456	2.405545356	0.017914323	0.016437862	0.170739818	0.016437862	0.170739818
JUL b_{10}	0.115200622	0.044614988	2.582105836	0.011211764	0.026727428	0.203673816	0.026727428	0.203673816
AUG b_{11}	0.070896677	0.042405594	1.671870861	0.097555993	-0.013195205	0.15498856	-0.013195205	0.15498856
SEP b_{12}	0.078868101	0.036589882	2.155462024	0.033432148	0.006308994	0.151427208	0.006308994	0.151427208
OCT b_{13}	0.053481269	0.023968577	2.231307666	0.027806888	0.005950683	0.101011856	0.005950683	0.101011856
NOV b_{14}	0.040715299	0.01396021	2.916524797	0.004336667	0.013031679	0.068398919	0.013031679	0.068398919
DEC b_{15}	0.016208264	0.0113332	1.430157751	0.155669239	-0.006265896	0.038682424	-0.006265896	0.038682424

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Superstition Commercial 2000-2009

Regression Statistics	
Multiple R	0.944418508
R Square	0.891926318
Adjusted R Square	0.876338767
Standard Error	0.032483259
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.905652443	0.06037683	57.22042894	3.26556E-43
Residual	104	0.109736861	0.001055162		
Total	119	1.015389305			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.62642323	0.079398868	20.48421184	2.73576E-38	1.468972299	1.78387416	1.468972299	1.78387416
AvgTemp b_1	0.001130163	0.001470563	0.768524136	0.443917522	-0.001786019	0.004046345	-0.001786019	0.004046345
TotPrecip b_2	0.003056154	0.004513489	0.677115637	0.499835992	-0.005894264	0.012006572	-0.005894264	0.012006572
PDSI b_3	-0.00540304	0.001448834	-3.729234444	0.00031303	-0.008276132	-0.002529949	-0.008276132	-0.002529949
CodedMonth b_4	-0.000995075	8.6813E-05	-11.46227626	3.70822E-20	-0.001167228	-0.000822921	-0.001167228	-0.000822921
FEB b_5	-0.000731573	0.014984596	-0.048821675	0.961155045	-0.030446588	0.028983442	-0.030446588	0.028983442
MAR b_6	-0.015700185	0.019000676	-0.826296132	0.410527772	-0.053379237	0.021978867	-0.053379237	0.021978867
APR b_7	0.045074782	0.0264189	1.706156666	0.09096355	-0.007314886	0.097464451	-0.007314886	0.097464451
MAY b_8	0.076470007	0.039839155	1.919468605	0.057665513	-0.00253253	0.155472543	-0.00253253	0.155472543
JUN b_9	0.146089991	0.050927728	2.868574664	0.004993874	0.045098398	0.247081585	0.045098398	0.247081585
JUL b_{10}	0.183823305	0.058401577	3.14757433	0.00214834	0.068010789	0.299635821	0.068010789	0.299635821
AUG b_{11}	0.147867065	0.055509453	2.663817737	0.008955981	0.03778974	0.257944389	0.03778974	0.257944389
SEP b_{12}	0.148663927	0.047896612	3.103850559	0.002460698	0.05368315	0.243644705	0.05368315	0.243644705
OCT b_{13}	0.105423894	0.031375167	3.360106257	0.001090322	0.043205763	0.167642025	0.043205763	0.167642025
NOV b_{14}	0.088204609	0.018274089	4.826758099	4.78096E-06	0.051966405	0.124442814	0.051966405	0.124442814
DEC b_{15}	0.040980885	0.0148353	2.762390036	0.00678612	0.011561929	0.070399842	0.011561929	0.070399842

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of *observations*) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the *dependent variable* and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Superstition Total 2000-2009

Regression Statistics	
Multiple R	0.951801775
R Square	0.905926618
Adjusted R Square	0.892358342
Standard Error	0.024199575
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.586509544	0.039100636	66.76799624	2.65355E-46
Residual	104	0.060904421	0.000585619		
Total	119	0.647413965			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.878633347	0.059151049	14.85406188	1.84899E-27	0.7613346	0.995932094	0.7613346	0.995932094
AvgTemp b_1	0.00155165	0.001095549	1.416321336	0.159669676	-0.000620865	0.003724165	-0.000620865	0.003724165
TotPrecip b_2	0.005052003	0.003362487	1.502460491	0.136008628	-0.001615934	0.01171994	-0.001615934	0.01171994
PDSI b_3	-0.00477293	0.001079361	-4.421996156	2.41135E-05	-0.006913343	-0.002632517	-0.006913343	-0.002632517
CodedMonth b_4	-0.000550114	6.46745E-05	-8.505892795	1.42667E-13	-0.000678366	-0.000421862	-0.000678366	-0.000421862
FEB b_5	-0.006576804	0.011163315	-0.589144338	0.557042027	-0.028714076	0.015560468	-0.028714076	0.015560468
MAR b_6	-0.02662396	0.014155239	-1.880855647	0.062788861	-0.054694329	0.001446408	-0.054694329	0.001446408
APR b_7	0.027963218	0.019681712	1.420771615	0.158374479	-0.011066355	0.06699279	-0.011066355	0.06699279
MAY b_8	0.050482969	0.029679615	1.700930753	0.09194426	-0.008372819	0.109338757	-0.008372819	0.109338757
JUN b_9	0.104377399	0.037940447	2.751085084	0.007008011	0.02914007	0.179614728	0.02914007	0.179614728
JUL b_{10}	0.12896478	0.043508361	2.964137889	0.003763658	0.042686071	0.215243489	0.042686071	0.215243489
AUG b_{11}	0.087169885	0.041353768	2.107906693	0.037442306	0.005163813	0.169175956	0.005163813	0.169175956
SEP b_{12}	0.093419569	0.035682308	2.61809209	0.01016175	0.022660215	0.164178924	0.022660215	0.164178924
OCT b_{13}	0.064313427	0.023374062	2.751487038	0.007000009	0.017961788	0.110665067	0.017961788	0.110665067
NOV b_{14}	0.050838523	0.013613942	3.734298544	0.000307533	0.023841566	0.07783548	0.023841566	0.07783548
DEC b_{15}	0.021490247	0.011052092	1.94445065	0.054542261	-0.000426465	0.043406959	-0.000426465	0.043406959

MULTIPLE R - *The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.*

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the *independent variables.* The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Cochise Residential 2000-2009

Regression Statistics	
Multiple R	0.957830189
R Square	0.91743867
Adjusted R Square	0.905530786
Standard Error	0.035256099
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.436488742	0.095765916	77.04464248	3.24224E-49
Residual	104	0.129271225	0.001242993		
Total	119	1.565759966			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.548001115	0.081236674	6.745735487	8.81876E-10	0.386905747	0.709096484	0.386905747	0.709096484
AvgTemp b_1	0.005411134	0.001666692	3.246631315	0.001572006	0.002106022	0.008716246	0.002106022	0.008716246
TotPrecip b_2	0.008962314	0.004666617	1.920516278	0.057531566	-0.000291762	0.018216391	-0.000291762	0.018216391
PDSI b_3	-0.007916669	0.001676044	-4.72342493	7.28285E-06	-0.011240328	-0.004593011	-0.011240328	-0.004593011
CodedMonth b_4	-0.001045521	9.42779E-05	-11.08977222	2.4896E-19	-0.001232477	-0.000858564	-0.001232477	-0.000858564
FEB b_5	-0.043394417	0.016241517	-2.671820359	0.008758804	-0.075601955	-0.011186879	-0.075601955	-0.011186879
MAR b_6	-0.049252477	0.0202117	-2.436830021	0.016514631	-0.089333036	-0.009171919	-0.089333036	-0.009171919
APR b_7	0.021780181	0.028378921	0.767477428	0.444536645	-0.034496282	0.078056644	-0.034496282	0.078056644
MAY b_8	0.054467529	0.041657986	1.3074931	0.193928425	-0.028141818	0.137076875	-0.028141818	0.137076875
JUN b_9	0.10979235	0.055140638	1.991133118	0.049088981	0.000446399	0.219138302	0.000446399	0.219138302
JUL b_{10}	0.077585234	0.062132912	1.248697851	0.214579165	-0.045626659	0.200797127	-0.045626659	0.200797127
AUG b_{11}	-0.055542672	0.057959104	-0.958307971	0.340130008	-0.170477748	0.059392404	-0.170477748	0.059392404
SEP b_{12}	-0.017476083	0.049172873	-0.355400893	0.72300908	-0.114987733	0.080035567	-0.114987733	0.080035567
OCT b_{13}	0.025253115	0.03305459	0.763982111	0.446607724	-0.040295375	0.090801606	-0.040295375	0.090801606
NOV b_{14}	0.042249568	0.020177537	2.093891208	0.038700742	0.002236755	0.082262381	0.002236755	0.082262381
DEC b_{15}	0.010374875	0.015970937	0.649609632	0.51737662	-0.021296092	0.042045842	-0.021296092	0.042045842

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Cochise Commercial 2000-2009

Regression Statistics	
Multiple R	0.886066291
R Square	0.785113472
Adjusted R Square	0.754120223
Standard Error	0.039828488
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.602759703	0.04018398	25.33175747	4.82587E-28
Residual	104	0.164976076	0.001586308		
Total	119	0.767735779			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.18988785	0.091772315	12.96565144	1.87773E-23	1.00789991	1.371875789	1.00789991	1.371875789
AvgTemp b_1	0.003354532	0.001882846	1.781628423	0.077728681	-0.000379222	0.007088287	-0.000379222	0.007088287
TotPrecip b_2	0.011096858	0.005271834	2.104933076	0.037706311	0.000642613	0.021551103	0.000642613	0.021551103
PDSI b_3	-0.003240461	0.001893412	-1.711440279	0.089980705	-0.006995167	0.000514245	-0.006995167	0.000514245
CodedMonth b_4	0.000995736	0.000106505	9.3492021	1.91291E-15	0.000784533	0.001206939	0.000784533	0.001206939
FEB b_5	-0.027970625	0.018347891	-1.524459914	0.130429105	-0.06435518	0.008413931	-0.06435518	0.008413931
MAR b_6	-0.029195134	0.022832969	-1.278639396	0.20387006	-0.074473768	0.0160835	-0.074473768	0.0160835
APR b_7	0.000180798	0.032059403	0.005639459	0.99551119	-0.063394199	0.063755795	-0.063394199	0.063755795
MAY b_8	0.011636333	0.047060639	0.247262529	0.805192527	-0.081686678	0.104959343	-0.081686678	0.104959343
JUN b_9	0.028345933	0.062291866	0.455050304	0.650021571	-0.095181172	0.151873037	-0.095181172	0.151873037
JUL b_{10}	0.045731078	0.070190973	0.651523643	0.51614567	-0.093460251	0.184922408	-0.093460251	0.184922408
AUG b_{11}	-0.045526675	0.065475861	-0.695319992	0.48840551	-0.175367762	0.084314411	-0.175367762	0.084314411
SEP b_{12}	0.00335234	0.055550137	0.060348003	0.951994287	-0.106805664	0.113510344	-0.106805664	0.113510344
OCT b_{13}	0.006997488	0.037341463	0.187391919	0.851718464	-0.067052031	0.081047008	-0.067052031	0.081047008
NOV b_{14}	0.041481738	0.022794376	1.819823357	0.071662403	-0.003720364	0.086683841	-0.003720364	0.086683841
DEC b_{15}	0.007959694	0.018042219	0.441170424	0.660005429	-0.027818703	0.04373809	-0.027818703	0.04373809

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Cochise Total 2000-2009

Regression Statistics	
Multiple R	0.955639589
R Square	0.913247025
Adjusted R Square	0.900734576
Standard Error	0.031588152
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.092410004	0.072827334	72.98707638	4.13606E-48
Residual	104	0.103772381	0.000997811		
Total	119	1.196182385			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.646305571	0.072785035	8.879649129	2.12228E-14	0.501970119	0.790641022	0.501970119	0.790641022
AvgTemp b_1	0.00486857	0.001493294	3.260289244	0.001504964	0.001907312	0.007829828	0.001907312	0.007829828
TotPrecip b_2	0.009416528	0.004181115	2.252157091	0.026413494	0.00112522	0.017707837	0.00112522	0.017707837
PDSI b_3	-0.00656758	0.001501673	-4.373508031	2.91064E-05	-0.009545454	-0.003589706	-0.009545454	-0.003589706
CodedMonth b_4	-0.000560345	8.44695E-05	-6.633690235	1.50589E-09	-0.000727851	-0.000392838	-0.000727851	-0.000392838
FEB b_5	-0.038725909	0.014551795	-2.661246202	0.00902019	-0.067582663	-0.009869154	-0.067582663	-0.009869154
MAR b_6	-0.043658923	0.01810893	-2.410905638	0.017667261	-0.07956961	-0.007748235	-0.07956961	-0.007748235
APR b_7	0.017184368	0.025426456	0.675845967	0.500638556	-0.033237247	0.067605983	-0.033237247	0.067605983
MAY b_8	0.047248253	0.037324004	1.265894543	0.208379245	-0.026766645	0.12126315	-0.026766645	0.12126315
JUN b_9	0.094539352	0.049403958	1.913598733	0.058420862	-0.003430548	0.192509252	-0.003430548	0.192509252
JUL b_{10}	0.074411611	0.055668775	1.336684885	0.184242352	-0.035981657	0.184804879	-0.035981657	0.184804879
AUG b_{11}	-0.051314135	0.051929199	-0.988155709	0.325369828	-0.154291683	0.051663413	-0.154291683	0.051663413
SEP b_{12}	-0.010586689	0.044057063	-0.240294922	0.810574654	-0.097953496	0.076780118	-0.097953496	0.076780118
OCT b_{13}	0.022222634	0.029615682	0.750367121	0.454727925	-0.036506373	0.08095164	-0.036506373	0.08095164
NOV b_{14}	0.043053848	0.018078322	2.381517898	0.019059908	0.007203858	0.078903838	0.007203858	0.078903838
DEC b_{15}	0.011004834	0.014309365	0.769065159	0.443597706	-0.017371173	0.039380841	-0.017371173	0.039380841

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

San Manuel/Oracle/Winkelman Residential 2000-2009

Regression Statistics	
Multiple R	0.968811241
R Square	0.938595221
Adjusted R Square	0.929738763
Standard Error	0.033859183
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.822478711	0.121498581	105.9786167	7.72702E-56
Residual	104	0.119230207	0.001146444		
Total	119	1.941708918			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.674207659	0.078017917	8.641702869	7.14811E-14	0.519495206	0.828920112	0.519495206	0.828920112
AvgTemp b_1	0.002553209	0.001600654	1.595103086	0.113723703	-0.000620949	0.005727366	-0.000620949	0.005727366
TotPrecip b_2	0.007543582	0.004481717	1.683190346	0.095337927	-0.00134383	0.016430994	-0.00134383	0.016430994
PDSI b_3	-0.007245484	0.001609636	-4.501318216	1.76765E-05	-0.010437453	-0.004053516	-0.010437453	-0.004053516
CodedMonth b_4	-0.001221138	9.05424E-05	-13.48691364	1.41614E-24	-0.001400687	-0.001041589	-0.001400687	-0.001041589
FEB b_5	-0.039027533	0.015597997	-2.502086291	0.013904489	-0.069958945	-0.008096122	-0.069958945	-0.008096122
MAR b_6	-0.02028433	0.019410873	-1.044998356	0.298446562	-0.058776818	0.018208158	-0.058776818	0.018208158
APR b_7	0.054283779	0.027254492	1.991736973	0.049021598	0.000237101	0.108330458	0.000237101	0.108330458
MAY b_8	0.148798418	0.040007414	3.719271073	0.000324119	0.069462217	0.22813462	0.069462217	0.22813462
JUN b_9	0.215825985	0.052955857	4.075582867	8.99307E-05	0.110812536	0.320839435	0.110812536	0.320839435
JUL b_{10}	0.21368172	0.059671084	3.580992769	0.000522107	0.095351725	0.332011715	0.095351725	0.332011715
AUG b_{11}	0.115008304	0.055662651	2.066166504	0.041297795	0.004627182	0.225389426	0.004627182	0.225389426
SEP b_{12}	0.121067713	0.047224547	2.563660643	0.011787006	0.027419666	0.214715759	0.027419666	0.214715759
OCT b_{13}	0.114103306	0.031744902	3.594382056	0.000498814	0.051151976	0.177054636	0.051151976	0.177054636
NOV b_{14}	0.064225362	0.019378064	3.314333331	0.00126502	0.025797936	0.102652789	0.025797936	0.102652789
DEC b_{15}	0.015062027	0.015338137	0.981998464	0.328379562	-0.015354074	0.045478128	-0.015354074	0.045478128

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MS - SS divided by df (degrees of freedom)

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SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

San Manuel/Oracle/Winkelman Commercial 2000-2009

Regression Statistics	
Multiple R	0.897184143
R Square	0.804939386
Adjusted R Square	0.776805643
Standard Error	0.072532968
Observations	*120*

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.25786426	0.150524284	28.61117347	3.68307E-30
Residual	104	0.547147273	0.005261031		
Total	119	2.805011533			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.218276576	0.16712958	7.289413243	6.30379E-11	0.886852356	1.549700797	0.886852356	1.549700797
AvgTemp b_1	0.00131045	0.003428913	0.382176514	0.703110286	-0.005489213	0.008110114	-0.005489213	0.008110114
TotPrecip b_2	-0.005508205	0.00960071	-0.573728906	0.567389937	-0.024546774	0.013530363	-0.024546774	0.013530363
PDSI b_3	-0.007122823	0.003448154	-2.065691666	0.041343548	-0.013960642	-0.000285004	-0.013960642	-0.000285004
CodedMonth b_4	-0.00018197	0.00019396	-0.938184092	0.350323539	-0.000566599	0.000202659	-0.000566599	0.000202659
FEB b_5	-0.006257279	0.033413948	-0.187265483	0.851817337	-0.07251839	0.060003832	-0.07251839	0.060003832
MAR b_6	0.018639707	0.041581871	0.448265224	0.65489429	-0.063818702	0.101098116	-0.063818702	0.101098116
APR b_7	0.099576971	0.058384432	1.70553977	0.091078873	-0.016201546	0.215355489	-0.016201546	0.215355489
MAY b_8	0.23259587	0.085703677	2.713954398	0.0077841	0.062642268	0.402549472	0.062642268	0.402549472
JUN b_9	0.300962458	0.113441765	2.65301283	0.009228583	0.076003187	0.525921729	0.076003187	0.525921729
JUL b_{10}	0.34618469	0.127827089	2.708226353	0.007910549	0.092698784	0.599670596	0.092698784	0.599670596
AUG b_{11}	0.277791061	0.119240244	2.329675391	0.021755354	0.04133319	0.514248932	0.04133319	0.514248932
SEP b_{12}	0.241968222	0.101164182	2.391836893	0.018560185	0.041355859	0.442580584	0.041355859	0.442580584
OCT b_{13}	0.245198908	0.068003765	3.605666634	0.000479949	0.110344893	0.380052923	0.110344893	0.380052923
NOV b_{14}	0.166804842	0.041511588	4.018271752	0.000111087	0.084485807	0.249123877	0.084485807	0.249123877
DEC b_{15}	0.042884254	0.032857279	1.30516757	0.194716069	-0.02227296	0.108041469	-0.02227296	0.108041469

MULTIPLE R - The correlation coefficient *which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.*

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. *The Value of R2 will alwas be between 0 and 1.*

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

San Manuel/Oracle/Winkelman Total 2000-2009

Regression Statistics	
Multiple R	0.964489506
R Square	0.930240007
Adjusted R Square	0.92017847
Standard Error	0.036546011
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.852259714	0.123483981	92.45505622	5.55015E-53
Residual	104	0.138903534	0.001335611		
Total	119	1.991163247			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.733946176	0.084208872	8.715782056	4.90002E-14	0.566956828	0.900935525	0.566956828	0.900935525
AvgTemp b_1	0.00233225	0.001727671	1.34993899	0.17996638	-0.001093786	0.005758287	-0.001093786	0.005758287
TotPrecip b_2	0.005044766	0.004837354	1.042877115	0.299423361	-0.004547889	0.014637421	-0.004547889	0.014637421
PDSI b_3	-0.007155857	0.001737366	-4.118797347	7.65915E-05	-0.010601117	-0.003710596	-0.010601117	-0.003710596
CodedMonth b_4	-0.000977328	9.77273E-05	-10.00056419	6.71019E-17	-0.001171125	-0.000783531	-0.001171125	-0.000783531
FEB b_5	-0.033174669	0.016835744	-1.970490211	0.051440364	-0.066560581	0.000211242	-0.066560581	0.000211242
MAR b_6	-0.013623489	0.020951183	-0.65024913	0.516965171	-0.05517047	0.027923493	-0.05517047	0.027923493
APR b_7	0.063119909	0.029417217	2.145679122	0.034225228	0.004784465	0.121455354	0.004784465	0.121455354
MAY b_8	0.165493897	0.043182122	3.832463291	0.000217468	0.079862131	0.251125663	0.079862131	0.251125663
JUN b_9	0.231419188	0.057158063	4.048758415	9.93016E-05	0.118072608	0.344765769	0.118072608	0.344765769
JUL b_{10}	0.238204601	0.064406163	3.698475281	0.000348477	0.110484767	0.365924435	0.110484767	0.365924435
AUG b_{11}	0.145821633	0.060079648	2.427138588	0.016937441	0.026681439	0.264961827	0.026681439	0.264961827
SEP b_{12}	0.143710952	0.050971956	2.819412154	0.005761485	0.042631654	0.244790251	0.042631654	0.244790251
OCT b_{13}	0.139849098	0.034263955	4.081522384	8.79735E-05	0.071902392	0.207795805	0.071902392	0.207795805
NOV b_{14}	0.083905104	0.020915771	4.011571207	0.000113851	0.042428347	0.125381862	0.042428347	0.125381862
DEC b_{15}	0.019648369	0.016555264	1.186835123	0.237996641	-0.01318134	0.052478079	-0.01318134	0.052478079

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Eastern Group Residential 2000-2009

Regression Statistics	
Multiple R	0.965126854
R Square	0.931469844
Adjusted R Square	0.921585687
Standard Error	0.022656347
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.725604905	0.04837366	94.23867258	2.21959E-53
Residual	104	0.053384248	0.00051331		
Total	119	0.778989153			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.719669309	0.055700795	12.92026993	2.35454E-23	0.609212545	0.830126073	0.609212545	0.830126073
AvgTemp b_1	0.002602832	0.001084039	2.401049763	0.018123893	0.000453142	0.004752522	0.000453142	0.004752522
TotPrecip b_2	0.007244519	0.003270799	2.214908102	0.028947656	0.000758402	0.013730637	0.000758402	0.013730637
PDSI b_3	-0.00681159	0.001106441	-6.156303684	1.41606E-08	-0.009005705	-0.004617475	-0.009005705	-0.004617475
CodedMonth b_4	-0.00058084	6.01648E-05	-9.654188885	3.98887E-16	-0.000700151	-0.000461533	-0.000700151	-0.000461533
FEB b_5	-0.0165695	0.010459691	-1.584128841	0.116200647	-0.037311456	0.004172461	-0.037311456	0.004172461
MAR b_6	-0.03379452	0.013305852	-2.539823859	0.012569672	-0.060180526	-0.007408518	-0.060180526	-0.007408518
APR b_7	0.023063373	0.018746632	1.2302675	0.221372481	-0.014111902	0.060238647	-0.014111902	0.060238647
MAY b_8	0.051846787	0.028059231	1.8477622	0.067478691	-0.00379572	0.107489293	-0.00379572	0.107489293
JUN b_9	0.101460859	0.036542491	2.776517307	0.006517842	0.02899573	0.173925989	0.02899573	0.173925989
JUL b_{10}	0.10704138	0.041516809	2.578266088	0.011329385	0.024711993	0.189370767	0.024711993	0.189370767
AUG b_{11}	0.042583203	0.039149192	1.087716001	0.279234879	-0.035051112	0.120217518	-0.035051112	0.120217518
SEP b_{12}	0.058113611	0.033483644	1.735582067	0.085599657	-0.008285709	0.124512931	-0.008285709	0.124512931
OCT b_{13}	0.049449026	0.022122797	2.235206834	0.027541515	0.005578692	0.093319361	0.005578692	0.093319361
NOV b_{14}	0.041679066	0.012997172	3.206779674	0.00178391	0.015905188	0.067452945	0.015905188	0.067452945
DEC b_{15}	0.016364756	0.010311251	1.587077714	0.115530883	-0.00408284	0.036812353	-0.00408284	0.036812353

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R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 *will alwas be between 0 and 1.*

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Eastern Group Commercial 2000-2009

Regression Statistics	
Multiple R	0.953322176
R Square	0.908823172
Adjusted R Square	0.895672668
Standard Error	0.027972894
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.811153497	0.0540769	69.10937905	5.32563E-47
Residual	104	0.08137821	0.000782483		
Total	119	0.892531707			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.479313761	0.068771563	21.5105443	4.43319E-40	1.342937174	1.615690349	1.342937174	1.615690349
AvgTemp b_1	0.001740039	0.00133842	1.300069302	0.196451149	-0.000914098	0.004394176	-0.000914098	0.004394176
TotPrecip b_2	0.003325766	0.004038326	0.823550545	0.412079545	-0.004682386	0.011333917	-0.004682386	0.011333917
PDSI b_3	-0.00558922	0.001366079	-4.091428865	8.47997E-05	-0.008298204	-0.00288023	-0.008298204	-0.00288023
CodedMonth b_4	-0.00048519	7.4283E-05	-6.531649216	2.44448E-09	-0.000632497	-0.000337885	-0.000632497	-0.000337885
FEB b_5	-0.00775517	0.012914165	-0.600516232	0.549468667	-0.033364439	0.017854108	-0.033364439	0.017854108
MAR b_6	-0.01773383	0.016428209	-1.079474382	0.282873442	-0.050311583	0.014843923	-0.050311583	0.014843923
APR b_7	0.036380242	0.023145724	1.571791065	0.119036496	-0.009518596	0.082279079	-0.009518596	0.082279079
MAY b_8	0.071544953	0.03464362	2.065169646	0.041393898	0.002845356	0.14024455	0.002845356	0.14024455
JUN b_9	0.129914228	0.045117565	2.879460098	0.004837128	0.040444406	0.219384051	0.040444406	0.219384051
JUL b_{10}	0.165553623	0.051259157	3.22973749	0.001658792	0.063904793	0.267202453	0.063904793	0.267202453
AUG b_{11}	0.115638085	0.048335956	2.3923823	0.018534099	0.019786073	0.211490096	0.019786073	0.211490096
SEP b_{12}	0.122941044	0.041340927	2.973833735	0.003655885	0.040960436	0.204921651	0.040960436	0.204921651
OCT b_{13}	0.094580851	0.02731414	3.462706525	0.000777524	0.040415888	0.148745814	0.040415888	0.148745814
NOV b_{14}	0.084095821	0.016047093	5.240564311	8.43177E-07	0.052273835	0.115917807	0.052273835	0.115917807
DEC b_{15}	0.034260125	0.012730892	2.691101603	0.008299796	0.009014288	0.059505962	0.009014288	0.059505962

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Eastern Group Total 2000-2009

Regression Statistics	
Multiple R	0.967001998
R Square	0.935092865
Adjusted R Square	0.925731259
Standard Error	0.022240686
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.741125889	0.049408393	99.88594498	1.3501E-54
Residual	104	0.051443402	0.000494648		
Total	119	0.792569291			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.811481668	0.054678888	14.84085911	1.96945E-27	0.703051385	0.919911952	0.703051385	0.919911952
AvgTemp b_1	0.00241839	0.001064151	2.272600957	0.025107014	0.000308139	0.004528641	0.000308139	0.004528641
TotPrecip b_2	0.006285154	0.003210792	1.957509002	0.052967477	-8.19666E-05	0.012652274	-8.19666E-05	0.012652274
PDSI b_3	-0.00620207	0.001086142	-5.710178311	1.07777E-07	-0.008355927	-0.004048205	-0.008355927	-0.004048205
CodedMonth b_4	-0.00058698	5.9061E-05	-9.938560015	9.23287E-17	-0.000704101	-0.000469861	-0.000704101	-0.000469861
FEB b_5	-0.01466824	0.010267793	-1.428568403	0.156124797	-0.035029664	0.005693174	-0.035029664	0.005693174
MAR b_6	-0.03055555	0.013061738	-2.339317065	0.021229936	-0.056457464	-0.004653631	-0.056457464	-0.004653631
APR b_7	0.025477746	0.0184027	1.384456973	0.169181913	-0.011015497	0.061970989	-0.011015497	0.061970989
MAY b_8	0.05584844	0.027544446	2.027575361	0.045161105	0.001226772	0.110470109	0.001226772	0.110470109
JUN b_9	0.107802584	0.035872069	3.005195603	0.003326481	0.036666927	0.178938241	0.036666927	0.178938241
JUL b_{10}	0.119740018	0.040755126	2.938035796	0.004068515	0.038921077	0.20055896	0.038921077	0.20055896
AUG b_{11}	0.058821943	0.038430947	1.530587928	0.128907426	-0.017388064	0.13503195	-0.017388064	0.13503195
SEP b_{12}	0.072426843	0.03286934	2.203477239	0.029766775	0.00724571	0.137607976	0.00724571	0.137607976
OCT b_{13}	0.059357182	0.021716924	2.733222395	0.007372117	0.016291709	0.102422656	0.016291709	0.102422656
NOV b_{14}	0.050981792	0.012758721	3.995838848	0.000120601	0.025680771	0.076282814	0.025680771	0.076282814
DEC b_{15}	0.02039438	0.010122077	2.014841498	0.046501925	0.000321923	0.040466838	0.000321923	0.040466838

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between *0 and 1*.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the *denominator (104)*. At the *95% significance level the critical value of the F distribution* with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the *dependent variable and the explanatory variables if P is less than* α *(.05)*.

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Pinal Valley/Stanfield Residential 2000-2009

Regression Statistics	
Multiple R	0.97231947
R Square	0.945405152
Adjusted R Square	0.937530895
Standard Error	0.027642646
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.37612815	0.091741877	120.0627776	1.79218E-58
Residual	104	0.079468053	0.000764116		
Total	119	1.455596203			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.90197326	0.067566952	13.34932583	2.79416E-24	0.767985462	1.035961058	0.767985462	1.035961058
AvgTemp b_1	0.002031145	0.001251422	1.623069846	0.107601941	-0.000450471	0.004512761	-0.000450471	0.004512761
TotPrecip b_2	0.001380841	0.003840895	0.359510341	0.719942292	-0.006235797	0.00899748	-0.006235797	0.00899748
PDSI b_3	-0.005151455	0.00123293	-4.178220569	6.13125E-05	-0.007596402	-0.002706508	-0.007596402	-0.002706508
CodedMonth b_4	-0.00139692	7.38763E-05	-18.90891414	1.964E-35	-0.001543419	-0.001250421	-0.001543419	-0.001250421
FEB b_5	-0.025594258	0.012751611	-2.007139179	0.047329332	-0.05088118	-0.000307336	-0.05088118	-0.000307336
MAR b_6	-0.03990104	0.01616922	-2.467715851	0.01522922	-0.071965209	-0.007836871	-0.071965209	-0.007836871
APR b_7	0.044450105	0.02248199	1.977142814	0.050672349	-0.000132524	0.089032734	-0.000132524	0.089032734
MAY b_8	0.092199173	0.033902376	2.71954901	0.007662372	0.024969491	0.159428854	0.024969491	0.159428854
JUN b_9	0.153313814	0.043338545	3.537585639	0.000604894	0.067371855	0.239255772	0.067371855	0.239255772
JUL b_{10}	0.181118134	0.04969865	3.644327015	0.000420309	0.082563848	0.27967242	0.082563848	0.27967242
AUG b_{11}	0.126207592	0.047237506	2.671766606	0.008760116	0.032533847	0.219881338	0.032533847	0.219881338
SEP b_{12}	0.133977069	0.040759122	3.287045045	0.001381303	0.053150203	0.214803935	0.053150203	0.214803935
OCT b_{13}	0.105646129	0.02669968	3.956831231	0.00013903	0.052699662	0.158592595	0.052699662	0.158592595
NOV b_{14}	0.089011907	0.015550909	5.723904005	1.01358E-07	0.058173873	0.119849942	0.058173873	0.119849942
DEC b_{15}	0.022136169	0.012624563	1.753420573	0.082476124	-0.002898813	0.04717115	-0.002898813	0.04717115

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - *The sum of the squares of the differences between values of y and the average y.*

MS - SS divided by df (degrees of freedom)

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SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Pinal Valley/Stanfield Commercial 2000-2009

Regression Statistics	
Multiple R	0.968134956
R Square	0.937285293
Adjusted R Square	0.928239902
Standard Error	0.038342811
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.285091754	0.15233945	103.6202136	2.29533E-55
Residual	104	0.152897801	0.001470171		
Total	119	2.437989556			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.486546057	0.093721377	15.86133385	1.59479E-29	1.300693054	1.672399061	1.300693054	1.672399061
AvgTemp b_1	0.001023883	0.001735833	0.589851093	0.556569848	-0.00241834	0.004466106	-0.00241834	0.004466106
TotPrecip b_2	0.006432252	0.005327663	1.207330874	0.230043432	-0.004132704	0.016997208	-0.004132704	0.016997208
PDSI b_3	-0.005881043	0.001710184	-3.438835798	0.000841673	-0.009272402	-0.002489683	-0.009272402	-0.002489683
CodedMonth b_4	0.000406814	0.000102473	3.96996198	0.000132545	0.000203606	0.000610021	0.000203606	0.000610021
FEB b_5	-0.023493308	0.017687619	-1.32823462	0.187008095	-0.058568521	0.011581904	-0.058568521	0.011581904
MAR b_6	-0.030646192	0.022428147	-1.36641656	0.174755313	-0.075122049	0.013829665	-0.075122049	0.013829665
APR b_7	0.061895324	0.031184521	1.984809158	0.049799409	5.52492E-05	0.123735398	5.52492E-05	0.123735398
MAY b_8	0.131168573	0.047025613	2.789300629	0.006283463	0.037915019	0.224422126	0.037915019	0.224422126
JUN b_9	0.258454075	0.06011442	4.29936905	3.87162E-05	0.139244928	0.377663222	0.139244928	0.377663222
JUL b_{10}	0.314786541	0.068936452	4.566329287	1.36711E-05	0.178082973	0.451490109	0.178082973	0.451490109
AUG b_{11}	0.275691757	0.065522627	4.207580982	5.48892E-05	0.145757934	0.405625581	0.145757934	0.405625581
SEP b_{12}	0.270216903	0.05653653	4.779509837	5.79925E-06	0.158102845	0.382330961	0.158102845	0.382330961
OCT b_{13}	0.223542228	0.037034833	6.035999303	2.46403E-08	0.150100766	0.29698369	0.150100766	0.29698369
NOV b_{14}	0.198799289	0.021570494	9.216260186	3.78495E-15	0.15602419	0.241574388	0.15602419	0.241574388
DEC b_{15}	0.054815024	0.017511393	3.130249252	0.002267416	0.020089276	0.089540773	0.020089276	0.089540773

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MS - SS divided by df (degrees of freedom)

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Pinal Valley/Stanfield Total 2000-2009

Regression Statistics	
Multiple R	0.97167827
R Square	0.94415866
Adjusted R Square	0.936104621
Standard Error	0.029643882
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.545228303	0.10301522	117.2279664	5.74843E-58
Residual	104	0.091391016	0.00087876		
Total	119	1.636619318			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.986723787	0.072458576	13.617764	7.43367E-25	0.843035716	1.130411858	0.843035716	1.130411858
AvgTemp b_1	0.001931792	0.001342021	1.439465529	0.153021856	-0.000729485	0.00459307	-0.000729485	0.00459307
TotPrecip b_2	0.002463393	0.004118963	0.598061513	0.551099072	-0.005704665	0.010631451	-0.005704665	0.010631451
PDSI b_3	-0.005169417	0.00132219	-3.909736799	0.000164873	-0.00779137	-0.002547463	-0.00779137	-0.002547463
CodedMonth b_4	-0.001155743	7.92247E-05	-14.5881699	6.61695E-27	-0.001312848	-0.000998637	-0.001312848	-0.000998637
FEB b_5	-0.025284282	0.013674785	-1.84897101	0.067302377	-0.052401893	0.00183333	-0.052401893	0.00183333
MAR b_6	-0.03908492	0.017339818	-2.254055948	0.026289684	-0.073470428	-0.004699411	-0.073470428	-0.004699411
APR b_7	0.045944697	0.024109612	1.905658933	0.059455825	-0.001865567	0.09375496	-0.001865567	0.09375496
MAY b_8	0.098586863	0.036356796	2.711648845	0.007834773	0.026489975	0.170683751	0.026489975	0.170683751
JUN b_9	0.176069462	0.046476112	3.788386217	0.000254264	0.083905591	0.268233334	0.083905591	0.268233334
JUL b_{10}	0.211883625	0.053296668	3.975551051	0.000129873	0.106194335	0.317572915	0.106194335	0.317572915
AUG b_{11}	0.162671763	0.050657346	3.211217662	0.001759058	0.062216348	0.263127177	0.062216348	0.263127177
SEP b_{12}	0.167457696	0.043709947	3.831111827	0.000218517	0.080779233	0.25413616	0.080779233	0.25413616
OCT b_{13}	0.135873269	0.028632649	4.745396431	6.66231E-06	0.079093654	0.192652884	0.079093654	0.192652884
NOV b_{14}	0.118768431	0.016676743	7.121800245	1.43166E-10	0.085697825	0.151839037	0.085697825	0.151839037
DEC b_{15}	0.032244994	0.01353854	2.381718778	0.019050067	0.005397563	0.059092426	0.005397563	0.059092426

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t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Ajo Residential 2000-2009

Regression Statistics	
Multiple R	0.895277764
R Square	0.801522274
Adjusted R Square	0.772895679
Standard Error	0.040682056
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.695093068	0.046339538	27.99921799	8.84468E-30
Residual	104	0.172123091	0.00165503		
Total	119	0.867216159			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.786835961	0.096100756	8.187614665	7.15599E-13	0.59626456	0.977407361	0.59626456	0.977407361
AvgTemp b_1	-0.00164684	0.001734372	-0.949530769	0.344552062	-0.005086165	0.001792485	-0.005086165	0.001792485
TotPrecip b_2	-0.018314261	0.009355841	-1.957521504	0.052965988	-0.036867245	0.000238723	-0.036867245	0.000238723
PDSI b_3	-0.000934155	0.001418231	-0.65867663	0.511559075	-0.00374656	0.001878249	-0.00374656	0.001878249
CodedMonth b_4	-0.000602168	0.000109051	-5.521875882	2.48481E-07	-0.000818421	-0.000385915	-0.000818421	-0.000385915
FEB b_5	-0.000420683	0.019075358	-0.022053767	0.982447324	-0.038247833	0.037406466	-0.038247833	0.037406466
MAR b_6	-0.012123215	0.025009847	-0.484737669	0.628881841	-0.061718679	0.037472249	-0.061718679	0.037472249
APR b_7	0.082743423	0.033230975	2.48994868	0.014360033	0.016845154	0.148641692	0.016845154	0.148641692
MAY b_8	0.149823251	0.04896745	3.05964988	0.002818892	0.052718964	0.246927538	0.052718964	0.246927538
JUN b_9	0.221504365	0.061667451	3.591917021	0.000503027	0.0992155	0.343793231	0.0992155	0.343793231
JUL b_{10}	0.249747495	0.071322185	3.50168037	0.000682586	0.10831293	0.39118206	0.10831293	0.39118206
AUG b_{11}	0.203890897	0.068687923	2.968366037	0.003716305	0.067680172	0.340101622	0.067680172	0.340101622
SEP b_{12}	0.167627965	0.05860287	2.860405396	0.005114554	0.051416278	0.283839651	0.051416278	0.283839651
OCT b_{13}	0.120419153	0.038217679	3.15087563	0.00212632	0.044632064	0.196206243	0.044632064	0.196206243
NOV b_{14}	0.042578989	0.022695751	1.876077526	0.063448623	-0.002427536	0.087585515	-0.002427536	0.087585515
DEC b_{15}	-0.027333013	0.018555221	-1.473063155	0.143754174	-0.064128712	0.009462686	-0.064128712	0.009462686

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

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SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) *that there is no linear relationship between the dependent variable and the explanatory variables if P is less than* α *(.05).*

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Ajo Commercial 2000-2009

Regression Statistics	
Multiple R	0.678197953
R Square	0.459952463
Adjusted R Square	0.382060992
Standard Error	0.047494061
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.199798819	0.013319921	5.905042669	1.08786E-08
Residual	*104*	*0.234591329*	*0.002255686*		
Total	119	0.434390148			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.23443527	0.112192342	11.00284782	3.88622E-19	1.011953651	1.456916888	1.011953651	1.456916888
AvgTemp b_1	-0.001297841	0.002024784	-0.640977618	0.522947187	-0.005313065	0.002717382	-0.005313065	0.002717382
TotPrecip b_2	-0.015013287	0.01092243	-1.374537294	0.172229522	-0.036672875	0.0066463	-0.036672875	0.0066463
PDSI b_3	0.001535439	0.001655706	0.927362059	0.355885773	-0.001747889	0.004818767	-0.001747889	0.004818767
CodedMonth b_4	-0.000317661	0.000127312	-2.495146882	0.014163326	-0.000570124	-6.51974E-05	-0.000570124	-6.51974E-05
FEB b_5	0.052745491	0.02226943	2.368515561	0.019706545	0.008584377	0.096906605	0.008584377	0.096906605
MAR b_6	0.029270216	0.02919762	1.002486368	0.318435542	-0.028629758	0.08717019	-0.028629758	0.08717019
APR b_7	0.021592697	0.038795334	0.556579749	0.579010281	-0.055339904	0.098525299	-0.055339904	0.098525299
MAY b_8	0.040880275	0.057166802	0.71510516	0.476146338	-0.072483635	0.154244184	-0.072483635	0.154244184
JUN b_9	0.090286034	0.071993354	1.254088464	0.212621337	-0.052479484	0.233051552	-0.052479484	0.233051552
JUL b_{10}	0.110179668	0.083264724	1.323245456	0.188655571	-0.0549374	0.275296737	-0.0549374	0.275296737
AUG b_{11}	0.083203528	0.080189368	1.037588014	0.301868327	-0.075814995	0.24222205	-0.075814995	0.24222205
SEP b_{12}	0.075502223	0.068415624	1.103581586	0.272321657	-0.060168523	0.211172969	-0.060168523	0.211172969
OCT b_{13}	0.039894629	0.044617036	0.894156861	0.373302584	-0.048582626	0.128371884	-0.048582626	0.128371884
NOV b_{14}	-0.033759044	0.02649604	-1.274116581	0.205461934	-0.086301685	0.018783597	-0.086301685	0.018783597
DEC b_{15}	-0.084095247	0.0216622	-3.882119471	0.000182097	-0.1270522	-0.041138293	-0.1270522	-0.041138293

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STANDARD ERROR - Measure of the amount of variation there is in the estimate. *The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.*

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Ajo Total 2000-2009

Regression Statistics	
Multiple R	0.882716172
R Square	0.779187841
Adjusted R Square	0.747339934
Standard Error	0.036657699
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	0.493154413	0.032876961	24.46590378	1.89249E-27
Residual	104	0.139753837	0.001343787		
Total	119	0.63290825			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.86999571	0.08659426	10.04680571	5.28893E-17	0.698276047	1.041715374	0.698276047	1.041715374
AvgTemp b_1	-0.001497526	0.001562805	-0.958229671	0.340169292	-0.004596626	0.001601574	-0.004596626	0.001601574
TotPrecip b_2	-0.017096972	0.008430341	-2.028028415	0.045114016	-0.033814654	-0.000379289	-0.033814654	-0.000379289
PDSI b_3	-0.000247633	0.001277936	-0.193775834	0.846729381	-0.002781829	0.002286562	-0.002781829	0.002286562
CodedMonth b_4	-0.000576658	9.82638E-05	-5.868465347	5.28673E-08	-0.000771519	-0.000381797	-0.000771519	-0.000381797
FEB b_5	0.015049462	0.017188382	0.875560162	0.383286894	-0.019035743	0.049134668	-0.019035743	0.049134668
MAR b_6	-0.000123225	0.022535819	-0.005467967	0.99564769	-0.044812598	0.044566148	-0.044812598	0.044566148
APR b_7	0.065176766	0.029943695	2.176644081	0.031769445	0.005797297	0.124556235	0.005797297	0.124556235
MAY b_8	0.120094532	0.044123483	2.721782677	0.007614257	0.032596012	0.207593052	0.032596012	0.207593052
JUN b_9	0.185959431	0.055567172	3.34656999	0.001139473	0.075767646	0.296151216	0.075767646	0.296151216
JUL b_{10}	0.211541581	0.064266839	3.291613273	0.001361164	0.084098031	0.338985131	0.084098031	0.338985131
AUG b_{11}	0.170328973	0.061893164	2.751983603	0.006990136	0.047592509	0.293065436	0.047592509	0.293065436
SEP b_{12}	0.142406401	0.052805746	2.696797433	0.008168441	0.037690628	0.247122175	0.037690628	0.247122175
OCT b_{13}	0.098033735	0.034437103	2.846747451	0.005322301	0.02974367	0.166323801	0.02974367	0.166323801
NOV b_{14}	0.021530089	0.020450638	1.052783217	0.294880264	-0.019024293	0.062084471	-0.019024293	0.062084471
DEC b_{15}	-0.04311082	0.016719699	-2.578444818	0.011323885	-0.076266609	-0.009955031	-0.076266609	-0.009955031

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

White Tank Residential 2000-2009

Regression Statistics	
Multiple R	0.963031746
R Square	0.927430144
Adjusted R Square	0.916963338
Standard Error	0.04147963
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.286799219	0.152453281	88.60679481	4.24356E-52
Residual	104	0.17893821	0.00172056		
Total	119	2.465737429			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.795524105	0.101388708	7.846279181	3.98127E-12	0.594466499	0.996581712	0.594466499	0.996581712
AvgTemp b_1	0.001711566	0.001877842	0.911454042	0.364164025	-0.002012264	0.005435397	-0.002012264	0.005435397
TotPrecip b_2	0.00279753	0.005763518	0.485385871	0.628423613	-0.008631743	0.014226804	-0.008631743	0.014226804
PDSI b_3	-0.008123928	0.001850094	-4.391089003	2.71905E-05	-0.011792733	-0.004455122	-0.011792733	-0.004455122
CodedMonth b_4	0.000885783	0.000110856	7.99037155	1.93279E-12	0.000665951	0.001105615	0.000665951	0.001105615
FEB b_5	-0.025242048	0.019134641	-1.31918067	0.190005815	-0.063186757	0.012702661	-0.063186757	0.012702661
MAR b_6	-0.02650131	0.02426299	-1.092252423	0.277245945	-0.074615729	0.021613109	-0.074615729	0.021613109
APR b_7	0.047858769	0.033735722	1.418637761	0.158994499	-0.019040432	0.11475797	-0.019040432	0.11475797
MAY b_8	0.142849966	0.050872771	2.807984781	0.00595472	0.041967355	0.243732577	0.041967355	0.243732577
JUN b_9	0.24081469	0.06503237	3.702997279	0.000343037	0.111853063	0.369776316	0.111853063	0.369776316
JUL b_{10}	0.277253122	0.074576132	3.717719261	0.000325879	0.129365858	0.425140385	0.129365858	0.425140385
AUG b_{11}	0.250144109	0.070883022	3.528970736	0.000622735	0.109580421	0.390707796	0.109580421	0.390707796
SEP b_{12}	0.229635302	0.061161774	3.754555929	0.000286447	0.108349212	0.350921392	0.108349212	0.350921392
OCT b_{13}	0.208108499	0.040064647	5.194317575	1.0275E-06	0.128658803	0.287558194	0.128658803	0.287558194
NOV b_{14}	0.149917311	0.023335173	6.424521114	4.05267E-09	0.103642789	0.196191834	0.103642789	0.196191834
DEC b_{15}	0.074974411	0.018943997	3.957687018	0.000138598	0.037407755	0.112541067	0.037407755	0.112541067

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

White Tank Commercial 2000-2009

Regression Statistics	
Multiple R	0.785424492
R Square	0.616891633
Adjusted R Square	0.561635618
Standard Error	0.121919571
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.48924381	0.165949587	11.16424407	1.20199E-15
Residual	104	1.545895716	0.014864382		
Total	119	4.035139525			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.60476184	0.298008149	5.384959594	4.52172E-07	1.013800514	2.195723166	1.013800514	2.195723166
AvgTemp b_1	0.000322547	0.005519472	0.05843806	0.953511837	-0.010622773	0.011267867	-0.010622773	0.011267867
TotPrecip b_2	0.002442252	0.016940501	0.144166435	0.88564804	-0.031151396	0.036035899	-0.031151396	0.036035899
PDSI b_3	-0.004152263	0.005437914	-0.763576337	0.446848518	-0.01493585	0.006631325	-0.01493585	0.006631325
CodedMonth b_4	0.000964812	0.000325836	2.961036418	0.003798745	0.000318667	0.001610956	0.000318667	0.001610956
FEB b_5	-0.057130081	0.056241755	-1.015794783	0.312084468	-0.168659588	0.054399426	-0.168659588	0.054399426
MAR b_6	-0.007641512	0.071315327	-0.107151049	0.914875581	-0.149062478	0.133779454	-0.149062478	0.133779454
APR b_7	0.04402426	0.099158183	0.443980098	0.65797938	-0.152610133	0.240658653	-0.152610133	0.240658653
MAY b_8	0.134120325	0.149528489	0.896954993	0.371814568	-0.162400272	0.430640921	-0.162400272	0.430640921
JUN b_9	0.2591835	0.191147286	1.355936073	0.178056393	-0.11986873	0.638235729	-0.11986873	0.638235729
JUL b_{10}	0.33760349	0.219198918	1.540169509	0.126556259	-0.097076178	0.772283157	-0.097076178	0.772283157
AUG b_{11}	0.319777189	0.208343893	1.534852714	0.127856698	-0.093376557	0.732930936	-0.093376557	0.732930936
SEP b_{12}	0.283364549	0.179770584	1.57625649	0.118003825	-0.073127254	0.639856353	-0.073127254	0.639856353
OCT b_{13}	0.24270995	0.117760562	2.061046124	0.041793474	0.009186343	0.476233558	0.009186343	0.476233558
NOV b_{14}	0.220350868	0.068588227	3.21266313	0.001751033	0.084337844	0.356363892	0.084337844	0.356363892
DEC b_{15}	0.091674781	0.055681403	1.646416516	0.102696734	-0.018743527	0.202093089	-0.018743527	0.202093089

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SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. *The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb* is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is *not statistically different from zero if P is less than α (0.05).*

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

White Tank Total 2000-2009

Regression Statistics	
Multiple R	0.961297673
R Square	0.924093216
Adjusted R Square	0.913145122
Standard Error	0.043112186
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.353252985	0.156883532	84.40676822	4.29565E-51
Residual	104	0.1933007	0.001858661		
Total	119	2.546553684			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.812965566	0.105379166	7.71467074	7.68301E-12	0.603994732	1.021936401	0.603994732	1.021936401
AvgTemp b_1	0.001788613	0.00195175	0.916414859	0.361569494	-0.002081781	0.005659006	-0.002081781	0.005659006
TotPrecip b_2	0.00225697	0.005990359	0.376767	0.707114397	-0.009622137	0.014136076	-0.009622137	0.014136076
PDSI b_3	-0.00780225	0.00192291	-4.057521898	9.61418E-05	-0.011615452	-0.003989047	-0.011615452	-0.003989047
CodedMonth b_4	0.00108848	0.000115219	9.447025704	1.15728E-15	0.000859996	0.001316964	0.000859996	0.001316964
FEB b_5	-0.02770229	0.019887742	-1.392932895	0.166610528	-0.067140428	0.011735848	-0.067140428	0.011735848
MAR b_6	-0.026585536	0.025217933	-1.05423133	0.294220082	-0.076593643	0.023422571	-0.076593643	0.023422571
APR b_7	0.044730411	0.035063493	1.275697521	0.204904459	-0.024801809	0.114262631	-0.024801809	0.114262631
MAY b_8	0.136257474	0.052875022	2.576972442	0.011369262	0.031404325	0.241110624	0.031404325	0.241110624
JUN b_9	0.234175004	0.067591915	3.464541644	0.000772788	0.100137704	0.368212305	0.100137704	0.368212305
JUL b_{10}	0.273368572	0.0775113	3.52682217	0.000627261	0.119660759	0.427076385	0.119660759	0.427076385
AUG b_{11}	0.248756786	0.073672836	3.376506162	0.001033437	0.102660791	0.394852782	0.102660791	0.394852782
SEP b_{12}	0.227393195	0.06356898	3.577109368	0.000529053	0.101333525	0.353452864	0.101333525	0.353452864
OCT b_{13}	0.206838952	0.041641512	4.967133602	2.67709E-06	0.124262274	0.28941563	0.124262274	0.28941563
NOV b_{14}	0.153138277	0.024253599	6.314043396	6.80256E-09	0.105042481	0.201234072	0.105042481	0.201234072
DEC b_{15}	0.075070928	0.019689595	3.812720781	0.000233274	0.036025723	0.114116133	0.036025723	0.114116133

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - *If the null hypothesis (H0) that there is no linear relationship* between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if *P is less than* α *(.05)*.

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. *A general rule of thumb is that the width of the 95% confidence interval* is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Western Group Residential 2000-2009

Regression Statistics	
Multiple R	0.974087383
R Square	0.94884623
Adjusted R Square	0.941468282
Standard Error	0.026469701
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.351604388	0.090106959	128.6057144	6.21133E-60
Residual	104	0.072867087	0.000700645		
Total	119	1.424471475			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.912688939	0.064620759	14.12377308	6.25578E-26	0.784543552	1.040834325	0.784543552	1.040834325
AvgTemp b_1	0.001478275	0.001179698	1.25309573	0.212980903	-0.000861111	0.00381766	-0.000861111	0.00381766
TotPrecip b_2	0.00045541	0.004875506	0.093407654	0.925759421	-0.009212902	0.010123722	-0.009212902	0.010123722
PDSI b_3	-0.00469993	0.001061202	-4.428875417	2.34758E-05	-0.006804336	-0.002595529	-0.006804336	-0.002595529
CodedMonth b_4	-0.00113543	7.06005E-05	-16.08248882	5.71125E-30	-0.001275435	-0.000995428	-0.001275435	-0.000995428
FEB b_5	-0.02456571	0.012328304	-1.992627073	0.048922417	-0.049013202	-0.000118224	-0.049013202	-0.000118224
MAR b_6	-0.03596234	0.015971411	-2.251669203	0.026445387	-0.067634243	-0.004290428	-0.067634243	-0.004290428
APR b_7	0.050513025	0.021758939	2.321483834	0.022210734	0.007364234	0.093661815	0.007364234	0.093661815
MAY b_8	0.10837718	0.032531193	3.331485011	0.001196693	0.043866607	0.172887754	0.043866607	0.172887754
JUN b_9	0.177215697	0.04130647	4.290264854	4.00884E-05	0.095303419	0.259127975	0.095303419	0.259127975
JUL b_{10}	0.208821596	0.047636185	4.383675863	2.79831E-05	0.114357255	0.303285936	0.114357255	0.303285936
AUG b_{11}	0.154757165	0.045622457	3.392126935	0.000981855	0.064286123	0.245228207	0.064286123	0.245228207
SEP b_{12}	0.157628113	0.039091287	4.03230804	0.000105503	0.080108625	0.2351476	0.080108625	0.2351476
OCT b_{13}	0.123360125	0.025507369	4.836254361	4.59838E-06	0.072778056	0.173942193	0.072778056	0.173942193
NOV b_{14}	0.098151159	0.014912356	6.581867913	1.92661E-09	0.068579397	0.12772292	0.068579397	0.12772292
DEC b_{15}	0.024991412	0.012080447	2.068749034	0.041049715	0.001035434	0.04894739	0.001035434	0.04894739

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate *the strength of the association when there are more than one explanatory variables.*

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, *we can reject the null hypothesis* (H0) that *there is no linear relationship* between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval *is four standard deviations* (plus two and minus two from the estimated average.

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Western Group Commercial 2000-2009

Regression Statistics	
Multiple R	0.96758837
R Square	0.936227254
Adjusted R Square	0.927029262
Standard Error	0.038251954
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.234018374	0.148934558	101.7860458	5.43925E-55
Residual	104	0.152174043	0.001463212		
Total	119	2.386192417			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.485938747	0.093384896	15.91198154	1.2599E-29	1.300752998	1.671124495	1.300752998	1.671124495
AvgTemp b_1	0.000773495	0.001704808	0.45371368	0.650980279	-0.002607203	0.004154193	-0.002607203	0.004154193
TotPrecip b_2	0.005531423	0.007045703	0.785077509	0.434192912	-0.00844047	0.019503316	-0.00844047	0.019503316
PDSI b_3	-0.00461017	0.001533567	-3.006172117	0.003316679	-0.007651287	-0.001569046	-0.007651287	-0.001569046
CodedMonth b_4	0.000513006	0.000102026	5.028174924	2.07448E-06	0.000310684	0.000715328	0.000310684	0.000715328
FEB b_5	-0.02243975	0.017815907	-1.259534571	0.210656676	-0.057769361	0.01288986	-0.057769361	0.01288986
MAR b_6	-0.02795463	0.023080642	-1.211172164	0.228574435	-0.073724409	0.017815147	-0.073724409	0.017815147
APR b_7	0.061543549	0.031444326	1.957222679	0.053001589	-0.000811729	0.123898826	-0.000811729	0.123898826
MAY b_8	0.133419618	0.04701155	2.838017847	0.005459105	0.040193953	0.226645283	0.040193953	0.226645283
JUN b_9	0.26181318	0.059692899	4.386002102	2.7732E-05	0.143439925	0.380186435	0.143439925	0.380186435
JUL b_{10}	0.321556801	0.068840111	4.671067453	8.99604E-06	0.185044282	0.458069321	0.185044282	0.458069321
AUG b_{11}	0.282160188	0.065930027	4.279691658	4.17408E-05	0.151418473	0.412901902	0.151418473	0.412901902
SEP b_{12}	0.274669394	0.056491689	4.862120418	4.13475E-06	0.162644258	0.38669453	0.162644258	0.38669453
OCT b_{13}	0.22478937	0.036861266	6.098254132	1.85103E-08	0.151692097	0.297886642	0.151692097	0.297886642
NOV b_{14}	0.197893465	0.021550178	9.182915758	4.491E-15	0.155158656	0.240628275	0.155158656	0.240628275
DEC b_{15}	0.053447741	0.017457722	3.061552992	0.002802523	0.018828424	0.088067058	0.018828424	0.088067058

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Western Group Total 2000-2009

Regression Statistics	
Multiple R	0.973667568
R Square	0.948028533
Adjusted R Square	0.940532648
Standard Error	0.028241517
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.513093695	0.100872913	126.4732013	1.4091E-59
Residual	104	0.082948663	0.000797583		
Total	119	1.596042358			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.999786172	0.068946313	14.50093743	1.00717E-26	0.86306305	1.136509295	0.86306305	1.136509295
AvgTemp b_1	0.001292	0.001258664	1.026484802	0.307044697	-0.001203979	0.003787978	-0.001203979	0.003787978
TotPrecip b_2	0.001638534	0.005201861	0.314990018	0.753400354	-0.008676951	0.011954019	-0.008676951	0.011954019
PDSI b_3	-0.00486153	0.001132237	-4.293739049	3.95593E-05	-0.007106796	-0.002616261	-0.007106796	-0.002616261
CodedMonth b_4	-0.0009238	7.53263E-05	-12.264007	6.33935E-22	-0.001073177	-0.000774427	-0.001073177	-0.000774427
FEB b_5	-0.02382005	0.01315353	-1.810924373	0.073039432	-0.049903993	0.002263895	-0.049903993	0.002263895
MAR b_6	-0.03402647	0.017040498	-1.996800322	0.048459682	-0.067818419	-0.000234526	-0.067818419	-0.000234526
APR b_7	0.053059038	0.023215428	2.285507616	0.024311738	0.007021974	0.099096103	0.007021974	0.099096103
MAY b_8	0.115432479	0.03470875	3.325745766	0.001219162	0.046603727	0.184261231	0.046603727	0.184261231
JUN b_9	0.199440925	0.044071423	4.525402417	1.60755E-05	0.112045642	0.286836209	0.112045642	0.286836209
JUL b_{10}	0.239183215	0.050824834	4.70603043	7.81355E-06	0.138395665	0.339970764	0.138395665	0.339970764
AUG b_{11}	0.189718022	0.048676311	3.897543108	0.000172277	0.093191073	0.286244972	0.093191073	0.286244972
SEP b_{12}	0.189571182	0.041707962	4.545203718	1.48652E-05	0.106862732	0.272279633	0.106862732	0.272279633
OCT b_{13}	0.151048602	0.027214769	5.55024372	2.1929E-07	0.097080695	0.20501651	0.097080695	0.20501651
NOV b_{14}	0.125242083	0.015910552	7.871636385	3.50659E-12	0.093690862	0.156793305	0.093690862	0.156793305
DEC b_{15}	0.033124791	0.012889082	2.569988468	0.011586737	0.007565259	0.058684324	0.007565259	0.058684324

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

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MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is *no linear relationship* between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% *significance* level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Navajo Residential 2000-2009

Regression Statistics	
Multiple R	0.975000162
R Square	0.950625316
Adjusted R Square	0.943503967
Standard Error	0.042383154
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	3.596871496	0.239791433	133.489506	9.97596E-61
Residual	104	0.186818498	0.001796332		
Total	119	3.783689994			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.203795186	0.087242431	2.335964085	0.021411369	0.030790176	0.376800196	0.030790176	0.376800196
AvgTemp b_1	0.003946318	0.001831804	2.154333677	0.033522799	0.000313781	0.007578854	0.000313781	0.007578854
TotPrecip b_2	0.002977154	0.003446369	0.86385257	0.389656846	-0.003857124	0.009811433	-0.003857124	0.009811433
PDSI b_3	-0.004697023	0.00149521	-3.141380782	0.002190224	-0.007662079	-0.001731966	-0.007662079	-0.001731966
CodedMonth b_4	5.81128E-05	0.000123727	0.469686498	0.639562329	-0.000187242	0.000303468	-0.000187242	0.000303468
FEB b_5	-0.062568631	0.019480433	-3.211870596	0.001755429	-0.10119906	-0.023938202	-0.10119906	-0.023938202
MAR b_6	-0.128801955	0.024144401	-5.334651042	5.62362E-07	-0.176681207	-0.080922703	-0.176681207	-0.080922703
APR b_7	-0.080274219	0.033203106	-2.417671975	0.017359719	-0.146117222	-0.014431215	-0.146117222	-0.014431215
MAY b_8	0.066288646	0.049030422	1.351990128	0.179311391	-0.030940517	0.163517809	-0.030940517	0.163517809
JUN b_9	0.235011335	0.062654581	3.750904257	0.000290144	0.110764953	0.359257717	0.110764953	0.359257717
JUL b_{10}	0.274758086	0.0713567	3.850487543	0.000203932	0.133255075	0.416261096	0.133255075	0.416261096
AUG b_{11}	0.125813945	0.066570602	1.889932501	0.061551376	-0.006198054	0.257825944	-0.006198054	0.257825944
SEP b_{12}	0.125512795	0.057087849	2.198590366	0.030123084	0.012305451	0.238720139	0.012305451	0.238720139
OCT b_{13}	0.105689069	0.038923536	2.715299804	0.007754667	0.028502239	0.182875898	0.028502239	0.182875898
NOV b_{14}	-0.002273565	0.023273024	-0.097690995	0.922365694	-0.048424843	0.043877713	-0.048424843	0.043877713
DEC b_{15}	-0.055387882	0.0190917	-2.901149811	0.004538188	-0.093247439	-0.017528326	-0.093247439	-0.017528326

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the *number of predictors* in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Navajo Commercial 2000-2009

Regression Statistics	
Multiple R	0.952372202
R Square	0.907012811
Adjusted R Square	0.893601198
Standard Error	0.045032325
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.057180466	0.137145364	67.62890949	1.46174E-46
Residual	104	0.210902675	0.00202791		
Total	119	2.268083141			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.920877427	0.092695546	9.934430188	9.43122E-17	0.737058687	1.104696168	0.737058687	1.104696168
AvgTemp b_1	0.004672014	0.001946302	2.400457203	0.018151678	0.000812425	0.008531603	0.000812425	0.008531603
TotPrecip b_2	0.005573316	0.003661785	1.52202172	0.131038463	-0.001688141	0.012834773	-0.001688141	0.012834773
PDSI b_3	-0.001523839	0.001588668	-0.959192831	0.339686262	-0.004674227	0.001626549	-0.004674227	0.001626549
CodedMonth b_4	0.000142765	0.00013146	1.085990286	0.279994074	-0.000117926	0.000403455	-0.000117926	0.000403455
FEB b_5	-0.049959094	0.020698064	-2.413708597	0.017539279	-0.09100413	-0.008914058	-0.09100413	-0.008914058
MAR b_6	-0.083005338	0.025653554	-3.235627208	0.00162804	-0.133877298	-0.032133379	-0.133877298	-0.032133379
APR b_7	-0.069134238	0.035278476	-1.9596719	0.052710397	-0.139092778	0.000824302	-0.139092778	0.000824302
MAY b_8	-0.00234095	0.052095083	-0.044936108	0.964244405	-0.105647451	0.100965551	-0.105647451	0.100965551
JUN b_9	0.116960769	0.066570825	1.756937361	0.081871528	-0.015051671	0.248973208	-0.015051671	0.248973208
JUL b_{10}	0.128454556	0.075816872	1.694274008	0.093205945	-0.021893143	0.278802255	-0.021893143	0.278802255
AUG b_{11}	0.082852646	0.070731618	1.171366475	0.244128209	-0.057410803	0.223116095	-0.057410803	0.223116095
SEP b_{12}	0.080010016	0.060656142	1.319075247	0.190040931	-0.040273387	0.200293419	-0.040273387	0.200293419
OCT b_{13}	0.075048921	0.041356463	1.814684226	0.072454976	-0.006962495	0.157060336	-0.006962495	0.157060336
NOV b_{14}	0.008054519	0.024727711	0.32572845	0.745284278	-0.040981459	0.057090497	-0.040981459	0.057090497
DEC b_{15}	-0.057646241	0.020285033	-2.84181158	0.005399262	-0.097872221	-0.017420261	-0.097872221	-0.017420261

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.
R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.
ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.
SS - The sum of the squares of the differences between values of y and the average y.
MS - SS divided by df (degrees of freedom)
F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) *degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104).* At the 95% *significance level* the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.
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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Navajo Total 2000-2009

Regression Statistics	
Multiple R	0.977157733
R Square	0.954837236
Adjusted R Square	0.948323376
Standard Error	0.038808793
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	3.311634763	0.220775651	146.585466	9.9437E-63
Residual	*104*	*0.156636727*	*0.001506122*		
Total	119	3.46827149			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.265490246	0.079884886	3.323410194	0.001228418	0.107075523	0.423904969	0.107075523	0.423904969
AvgTemp b_1	0.004027801	0.00167732	2.401331611	0.018110691	0.000701613	0.00735399	0.000701613	0.00735399
TotPrecip b_2	0.003130251	0.003155721	0.991928803	0.323534519	-0.003127662	0.009388164	-0.003127662	0.009388164
PDSI b_3	-0.003878359	0.001369112	-2.832755039	0.005543128	-0.006593359	-0.001163358	-0.006593359	-0.001163358
CodedMonth b_4	6.85512E-05	0.000113292	0.605082517	0.546442207	-0.000156112	0.000293214	-0.000156112	0.000293214
FEB b_5	-0.060551968	0.017837561	-3.394632675	0.000973809	-0.09592452	-0.025179416	-0.09592452	-0.025179416
MAR b_6	-0.120576439	0.022108196	-5.453924865	3.34766E-07	-0.164417819	-0.076735058	-0.164417819	-0.076735058
APR b_7	-0.077963044	0.030402939	-2.564325893	0.011765806	-0.138253212	-0.017672877	-0.138253212	-0.017672877
MAY b_8	0.055946425	0.044895467	1.246148642	0.215509597	-0.033082968	0.144975817	-0.033082968	0.144975817
JUN b_9	0.217691588	0.05737064	3.794477271	0.000248848	0.10392346	0.331459717	0.10392346	0.331459717
JUL b_{10}	0.254346925	0.06533887	3.892735268	0.000175282	0.124777497	0.383916353	0.124777497	0.383916353
AUG b_{11}	0.12021952	0.060956405	1.972221276	0.051239575	-0.000659316	0.241098356	-0.000659316	0.241098356
SEP b_{12}	0.118790157	0.052273375	2.272479179	0.025114625	0.015130095	0.222450218	0.015130095	0.222450218
OCT b_{13}	0.100793328	0.03564094	2.828021071	0.005619718	0.030116009	0.171470647	0.030116009	0.171470647
NOV b_{14}	-0.000705965	0.021310306	-0.033127873	0.973636112	-0.042965099	0.041553169	-0.042965099	0.041553169
DEC b_{15}	-0.056160217	0.017481612	-3.21253089	0.001751766	-0.090826908	-0.021493526	-0.090826908	-0.021493526

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is *not statistically different from zero if P is less than α (0.05).*

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Sedona/Verde Valley Residential 2000-2009

Regression Statistics	
Multiple R	0.978914941
R Square	0.958274463
Adjusted R Square	0.952256356
Standard Error	0.033285891
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.646315903	0.17642106	159.2318918	1.65884E-64
Residual	104	0.115226856	0.001107951		
Total	119	2.761542758			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.591665703	0.066189061	8.939025503	1.5665E-14	0.460410315	0.722921091	0.460410315	0.722921091
AvgTemp b_1	0.002016895	0.0014478	1.393075448	0.166567538	-0.000854147	0.004887937	-0.000854147	0.004887937
TotPrecip b_2	0.008340093	0.00325257	2.56415437	0.011771268	0.001890124	0.014790062	0.001890124	0.014790062
PDSI b_3	-0.009425957	0.001384637	-6.807531417	6.55623E-10	-0.012171743	-0.006680171	-0.012171743	-0.006680171
CodedMonth b_4	-6.38575E-05	9.23341E-05	-0.691591061	0.490735195	-0.00024696	0.000119245	-0.00024696	0.000119245
FEB b_5	-0.037327373	0.015386439	-2.425991685	0.016988109	-0.067839258	-0.006815488	-0.067839258	-0.006815488
MAR b_6	-0.052042269	0.018753666	-2.775045027	0.006545342	-0.089231492	-0.014853046	-0.089231492	-0.014853046
APR b_7	0.049360643	0.024879554	1.983984234	0.049892722	2.3555E-05	0.09869773	2.3555E-05	0.09869773
MAY b_8	0.141570615	0.037517425	3.773462982	0.000268012	0.067172155	0.215969075	0.067172155	0.215969075
JUN b_9	0.257610738	0.048244988	5.33963734	5.50362E-07	0.16193912	0.353282356	0.16193912	0.353282356
JUL b_{10}	0.301855134	0.056667303	5.326795506	5.81787E-07	0.189481749	0.414228519	0.189481749	0.414228519
AUG b_{11}	0.235933919	0.052808877	4.467694283	2.01715E-05	0.131211937	0.340655901	0.131211937	0.340655901
SEP b_{12}	0.238063438	0.044430643	5.358091204	5.08093E-07	0.149955808	0.326171068	0.149955808	0.326171068
OCT b_{13}	0.201191267	0.029900789	6.72862725	9.57151E-10	0.141896881	0.260485653	0.141896881	0.260485653
NOV b_{14}	0.136691657	0.018234399	7.496361987	2.27246E-11	0.10053216	0.172851153	0.10053216	0.172851153
DEC b_{15}	0.043006759	0.015083606	2.851225252	0.005253354	0.013095403	0.072918115	0.013095403	0.072918115

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.
R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.
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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Sedona/Verde Valley Commercial 2000-2009

Regression Statistics	
Multiple R	0.973552488
R Square	0.947804447
Adjusted R Square	0.940276242
Standard Error	0.027115093
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.388483634	0.092565576	125.9004597	1.75975E-59
Residual	104	0.076463739	0.000735228		
Total	119	1.464947373			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.412646861	0.053918416	26.19970979	1.31637E-47	1.305724621	1.519569101	1.305724621	1.519569101
AvgTemp b_1	0.00166692	0.001179396	1.413367621	0.160533795	-0.000671866	0.004005706	-0.000671866	0.004005706
TotPrecip b_2	0.006548748	0.002649584	2.471613961	0.015073507	0.001294524	0.011802971	0.001294524	0.011802971
PDSI b_3	-0.003869569	0.001127942	-3.430645695	0.000864807	-0.00610632	-0.001632818	-0.00610632	-0.001632818
CodedMonth b_4	0.000132923	7.52165E-05	1.76720288	0.080127544	-1.62343E-05	0.00028208	-1.62343E-05	0.00028208
FEB b_5	-0.042918475	0.012533981	-3.424169556	0.000883522	-0.067773829	-0.018063122	-0.067773829	-0.018063122
MAR b_6	-0.025779856	0.015276965	-1.687498489	0.094504579	-0.056074651	0.004514939	-0.056074651	0.004514939
APR b_7	0.083302347	0.020267188	4.110207457	7.9082E-05	0.043111754	0.123492941	0.043111754	0.123492941
MAY b_8	0.138430739	0.030562152	4.529482689	1.58186E-05	0.077824846	0.199036632	0.077824846	0.199036632
JUN b_9	0.186749175	0.039300956	4.75177187	6.49206E-06	0.108813907	0.264684442	0.108813907	0.264684442
JUL b_{10}	0.22108583	0.046161876	4.789359722	5.57094E-06	0.1295451	0.31262656	0.1295451	0.31262656
AUG b_{11}	0.171372433	0.043018756	3.983667841	0.000126085	0.086064629	0.256680237	0.086064629	0.256680237
SEP b_{12}	0.176015463	0.036193744	4.863146053	4.11734E-06	0.104241912	0.247789013	0.104241912	0.247789013
OCT b_{13}	0.142274396	0.024357548	5.841080426	5.98388E-08	0.093972466	0.190576326	0.093972466	0.190576326
NOV b_{14}	0.131364315	0.014853964	8.843721103	2.55004E-14	0.101908347	0.160820282	0.101908347	0.160820282
DEC b_{15}	0.044498734	0.01228729	3.621525593	0.000454575	0.020132578	0.068864889	0.020132578	0.068864889

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association *when there are more than one explanatory variables.*

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df *(degrees of freedom)*

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory *variables is true, then* the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is *no linear relationship between the dependent variable* and the explanatory variables.

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Sedona/Verde Valley Total 2000-2009

Regression Statistics	
Multiple R	0.978950991
R Square	0.958345043
Adjusted R Square	0.952337116
Standard Error	0.030497062
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.225381953	0.148358797	159.5134419	1.51976E-64
Residual	104	0.096727365	0.000930071		
Total	119	2.322109318			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.729615299	0.06064347	12.03122616	2.05623E-21	0.609357026	0.849873571	0.609357026	0.849873571
AvgTemp b_1	0.001784333	0.001326498	1.345146169	0.181503898	-0.000846161	0.004414828	-0.000846161	0.004414828
TotPrecip b_2	0.007560862	0.002980057	2.537153677	0.012660191	0.001651298	0.013470426	0.001651298	0.013470426
PDSI b_3	-0.007799465	0.001268626	-6.147962465	1.47172E-08	-0.010315198	-0.005283732	-0.010315198	-0.005283732
CodedMonth b_4	1.66232E-05	8.4598E-05	0.196496247	0.844605236	-0.000151138	0.000184384	-0.000151138	0.000184384
FEB b_5	-0.036392238	0.0140973	-2.581504122	0.011230123	-0.064347712	-0.008436764	-0.064347712	-0.008436764
MAR b_6	-0.040832286	0.017182407	-2.376400773	0.019312114	-0.074905644	-0.006758928	-0.074905644	-0.006758928
APR b_7	0.06384383	0.022795043	2.800776949	0.006079631	0.018640406	0.109047254	0.018640406	0.109047254
MAY b_8	0.145203681	0.034374061	4.22422244	5.15409E-05	0.07703863	0.213368733	0.07703863	0.213368733
JUN b_9	0.243180336	0.044202825	5.501465987	2.71805E-07	0.155524479	0.330836194	0.155524479	0.330836194
JUL b_{10}	0.285770877	0.051919484	5.504116319	2.68659E-07	0.182812596	0.388729159	0.182812596	0.388729159
AUG b_{11}	0.223666901	0.048384333	4.622713357	1.09209E-05	0.127718956	0.319614846	0.127718956	0.319614846
SEP b_{12}	0.224720869	0.040708061	5.520303858	2.50205E-07	0.143995258	0.30544648	0.143995258	0.30544648
OCT b_{13}	0.188340326	0.027395579	6.874843892	4.74185E-10	0.134013867	0.242666785	0.134013867	0.242666785
NOV b_{14}	0.137836458	0.016706646	8.250396581	5.21067E-13	0.104706552	0.170966364	0.104706552	0.170966364
DEC b_{15}	0.045219788	0.01381984	3.272092027	0.001449189	0.017814527	0.072625048	0.017814527	0.072625048

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Northern Group Residential 2000-2009

Regression Statistics	
Multiple R	0.983872283
R Square	0.96800467
Adjusted R Square	0.963389958
Standard Error	0.030180332
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.865973883	0.191064926	209.7649547	1.78388E-70
Residual	104	0.094728656	0.000910852		
Total	119	2.960702539			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.436880784	0.063216599	6.910855502	3.98546E-10	0.311519898	0.562241669	0.311519898	0.562241669
AvgTemp b_1	0.002945102	0.001354735	2.173932269	0.031978215	0.000258612	0.005631592	0.000258612	0.005631592
TotPrecip b_2	0.006527233	0.002789451	2.339970308	0.021194747	0.000995647	0.01205882	0.000995647	0.01205882
PDSI b_3	-0.00827334	0.00121544	-6.806873383	6.57699E-10	-0.010683605	-0.005863081	-0.010683605	-0.005863081
CodedMonth b_4	-4.9246E-05	8.64455E-05	-0.569676024	0.57012594	-0.000220671	0.000122179	-0.000220671	0.000122179
FEB b_5	-0.04481852	0.013933328	-3.216641331	0.001729124	-0.072448831	-0.017188207	-0.072448831	-0.017188207
MAR b_6	-0.07728915	0.017326249	-4.460812691	2.07225E-05	-0.11164775	-0.04293055	-0.11164775	-0.04293055
APR b_7	0.008160093	0.023614663	0.345551964	0.730377425	-0.038668668	0.054988854	-0.038668668	0.054988854
MAY b_8	0.111030031	0.03546318	3.130853783	0.00226316	0.040705216	0.181354845	0.040705216	0.181354845
JUN b_9	0.239349654	0.045560151	5.25348689	7.97728E-07	0.149002168	0.329697141	0.149002168	0.329697141
JUL b_{10}	0.280949188	0.052747298	5.326323821	5.82974E-07	0.17634932	0.385549056	0.17634932	0.385549056
AUG b_{11}	0.191085528	0.049168343	3.88635277	0.00017935	0.09358286	0.288588195	0.09358286	0.288588195
SEP b_{12}	0.195965625	0.04168428	4.701187754	7.96785E-06	0.113304137	0.278627113	0.113304137	0.278627113
OCT b_{13}	0.16787555	0.028083558	5.97771658	3.21701E-08	0.112184803	0.223566298	0.112184803	0.223566298
NOV b_{14}	0.095911746	0.016720128	5.736304642	9.58822E-08	0.062755106	0.129068385	0.062755106	0.129068385
DEC b_{15}	0.015772459	0.013637636	1.156539027	0.250110467	-0.011271485	0.042816403	-0.011271485	0.042816403

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Northern Group Commercial 2000-2009

Regression Statistics	
Multiple R	0.976211748
R Square	0.952989376
Adjusted R Square	0.946208998
Standard Error	0.026211507
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.448469566	0.096564638	140.5510595	7.90304E-62
Residual	104	0.071452484	0.000687043		
Total	119	1.51992205			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.296498156	0.054903383	23.614176	1.38842E-43	1.18762269	1.405373623	1.18762269	1.405373623
AvgTemp b_1	0.002466157	0.001176582	2.096034236	0.038505991	0.00013295	0.004799363	0.00013295	0.004799363
TotPrecip b_2	0.005537414	0.002422628	2.285705321	0.02429973	0.000733252	0.010341577	0.000733252	0.010341577
PDSI b_3	-0.00361257	0.001055605	-3.422274947	0.000889068	-0.005705874	-0.001519266	-0.005705874	-0.001519266
CodedMonth b_4	0.000111093	7.50776E-05	1.479715112	0.141972152	-3.77882E-05	0.000259975	-3.77882E-05	0.000259975
FEB b_5	-0.04254441	0.012101044	-3.515763315	0.000651054	-0.06654123	-0.018547583	-0.06654123	-0.018547583
MAR b_6	-0.03652657	0.015047783	-2.427372414	0.016927127	-0.066366891	-0.006686256	-0.066366891	-0.006686256
APR b_7	0.056138602	0.020509248	2.737233615	0.007288886	0.015467995	0.096809208	0.015467995	0.096809208
MAY b_8	0.108647814	0.030799641	3.52756756	0.000625688	0.047570972	0.169724656	0.047570972	0.169724656
JUN b_9	0.165036367	0.039568823	4.170868757	6.30306E-05	0.086569908	0.243502825	0.086569908	0.243502825
JUL b_{10}	0.195009805	0.045810833	4.256849108	4.55373E-05	0.104165206	0.285854404	0.104165206	0.285854404
AUG b_{11}	0.147107541	0.042702525	3.444937788	0.000824817	0.062426835	0.231788248	0.062426835	0.231788248
SEP b_{12}	0.152187755	0.036202643	4.203774699	5.56838E-05	0.080396557	0.223978953	0.080396557	0.223978953
OCT b_{13}	0.127691877	0.024390467	5.235319163	8.62337E-07	0.079324668	0.176059086	0.079324668	0.176059086
NOV b_{14}	0.111591337	0.014521369	7.68462916	8.92364E-12	0.082794918	0.140387756	0.082794918	0.140387756
DEC b_{15}	0.030462581	0.011844237	2.571932752	0.011525821	0.006975015	0.053950146	0.006975015	0.053950146

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Northern Group Total 2000-2009

Regression Statistics	
Multiple R	0.983870162
R Square	0.968000496
Adjusted R Square	0.963385183
Standard Error	0.027854067
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2.440860132	0.162724009	209.7366898	1.79597E-70
Residual	104	0.0806883	0.000775849		
Total	119	2.521548432			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.559990617	0.058343936	9.59809459	5.32293E-16	0.444292406	0.675688828	0.444292406	0.675688828
AvgTemp b_1	0.002735675	0.001250313	2.187991126	0.030908692	0.000256256	0.005215093	0.000256256	0.005215093
TotPrecip b_2	0.00599124	0.002574444	2.327197965	0.0218922	0.000886022	0.011096458	0.000886022	0.011096458
PDSI b_3	-0.00697084	0.001121755	-6.214228913	1.08278E-08	-0.009195324	-0.00474636	-0.009195324	-0.00474636
CodedMonth b_4	-8.8114E-06	7.97824E-05	-0.11044303	0.912270876	-0.000167023	0.0001494	-0.000167023	0.0001494
FEB b_5	-0.0425202	0.012859363	-3.306555502	0.001297193	-0.068020796	-0.017019599	-0.068020796	-0.017019599
MAR b_6	-0.06411032	0.015990761	-4.009209998	0.00011484	-0.095820598	-0.032400041	-0.095820598	-0.032400041
APR b_7	0.024049223	0.021794472	1.103455199	0.272376255	-0.019170031	0.067268477	-0.019170031	0.067268477
MAY b_8	0.113330729	0.032729718	3.462624642	0.000777736	0.048426471	0.178234987	0.048426471	0.178234987
JUN b_9	0.224623509	0.042048426	5.342019413	5.44719E-07	0.141239905	0.308007114	0.141239905	0.308007114
JUL b_{10}	0.264538099	0.048681596	5.434047358	3.65139E-07	0.16800067	0.361075528	0.16800067	0.361075528
AUG b_{11}	0.183918264	0.045378504	4.052982136	9.77665E-05	0.093930991	0.273905537	0.093930991	0.273905537
SEP b_{12}	0.18771944	0.038471303	4.879466651	3.84964E-06	0.111429404	0.264009475	0.111429404	0.264009475
OCT b_{13}	0.159979866	0.025918909	6.172322441	1.31492E-08	0.108581698	0.211378035	0.108581698	0.211378035
NOV b_{14}	0.101727684	0.015431359	6.5922698	1.83375E-09	0.07112672	0.132328647	0.07112672	0.132328647
DEC b_{15}	0.020838411	0.012586463	1.655620876	0.100813151	-0.004121017	0.045797838	-0.004121017	0.045797838

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Total Company Residential 2000-2009

Regression Statistics	
Multiple R	0.97785548
R Square	0.95620134
Adjusted R Square	0.949884226
Standard Error	0.022812161
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.181557162	0.078770477	151.3667917	2.03645E-63
Residual	104	0.05412105	0.000520395		
Total	119	1.235678212			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.747765997	0.048846182	15.30858634	2.13223E-28	0.650902188	0.844629807	0.650902188	0.844629807
AvgTemp b_1	0.002056662	0.001079421	1.905337959	0.059497986	-8.38705E-05	0.004197194	-8.38705E-05	0.004197194
TotPrecip b_2	0.003260095	0.003286169	0.99206562	0.323468097	-0.003256501	0.009776691	-0.003256501	0.009776691
PDSI b_3	-0.004787025	0.000864043	-5.540263985	2.29154E-07	-0.006500454	-0.003073596	-0.006500454	-0.003073596
CodedMonth b_4	-0.000469551	6.1702E-05	-7.609987833	1.29359E-11	-0.000591909	-0.000347194	-0.000591909	-0.000347194
FEB b_5	-0.024313611	0.01064348	-2.284366656	0.024381137	-0.045420031	-0.003207191	-0.045420031	-0.003207191
MAR b_6	-0.041217347	0.013799317	-2.986912052	0.003515022	-0.06858191	-0.013852784	-0.06858191	-0.013852784
APR b_7	0.030857862	0.019415449	1.58934572	0.115017859	-0.007643702	0.069359425	-0.007643702	0.069359425
MAY b_8	0.084188472	0.029018712	2.90117876	0.0045378	0.026643278	0.141733666	0.026643278	0.141733666
JUN b_9	0.156479338	0.037210929	4.205198413	5.53853E-05	0.082688672	0.230270003	0.082688672	0.230270003
JUL b_{10}	0.181846055	0.043075765	4.221539779	5.20671E-05	0.096425199	0.267266911	0.096425199	0.267266911
AUG b_{11}	0.116816887	0.040552335	2.880645121	0.00482034	0.036400086	0.197233687	0.036400086	0.197233687
SEP b_{12}	0.124953746	0.033890497	3.68698477	0.000362671	0.057747621	0.192159871	0.057747621	0.192159871
OCT b_{13}	0.099615579	0.022498749	4.427605189	2.35923E-05	0.054999716	0.144231442	0.054999716	0.144231442
NOV b_{14}	0.071375096	0.013100293	5.448358842	3.43012E-07	0.045396724	0.097353467	0.045396724	0.097353467
DEC b_{15}	0.01980612	0.010325119	1.918246239	0.057822128	-0.000668977	0.040281217	-0.000668977	0.040281217

MULTIPLE R - The correlation coefficient which measures how well the data clusters around the regression line. The closer this value is to 1, the more "linear" the data is.

R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when *there are more than one explanatory variables.*

SS - The sum of the squares of the differences between values of y and the average y.

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no *linear relationship between the dependent variable and the explanatory variables.*

SIGNIFICANCE F - The associated P-value for the F-statistic. We reject the null hypothesis (H_0) that there is no linear relationship between the dependent variable and the explanatory variables if P is less than α (.05).

STANDARD ERROR - Measure of the amount of variation there is in the estimate. The smaller the standard error, the more precise (believable) the estimate is. A general rule of thumb is that the width of the 95% confidence interval is four standard deviations (plus two and minus two from the estimated average.

t-STATISTIC - The ratio of the estimate to its standard error. If the absolute value of the t-statistic is bigger than 1.98, then we reject the null hypothesis (H0) that the estimate is not statistically different from zero, and condlude that the estimate is statistically different from zero.

P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Total Company Commercial 2000-2009

Regression Statistics	
Multiple R	0.977900938
R Square	0.956290244
Adjusted R Square	0.949985953
Standard Error	0.02536417
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.463814362	0.097587624	151.6887695	1.83334E-63
Residual	104	0.066907477	0.000643341		
Total	119	1.53072184			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	1.465157668	0.054310631	26.9773642	9.25002E-49	1.357457652	1.572857684	1.357457652	1.572857684
AvgTemp b_1	0.001129444	0.001200176	0.941064841	0.348852389	-0.001250551	0.003509438	-0.001250551	0.003509438
TotPrecip b_2	0.003346031	0.003653794	0.915768833	0.361906701	-0.00389958	0.010591642	-0.00389958	0.010591642
PDSI b_3	-0.004100751	0.000960704	-4.268486412	4.35634E-05	-0.006005862	-0.002195639	-0.006005862	-0.002195639
CodedMonth b_4	0.000177751	6.86046E-05	2.590948636	0.010945061	4.17055E-05	0.000313797	4.17055E-05	0.000313797
FEB b_5	-0.02100337	0.011834172	-1.774806856	0.07885556	-0.044470976	0.002464237	-0.044470976	0.002464237
MAR b_6	-0.025095345	0.015343054	-1.635616031	0.104943051	-0.055521197	0.005330506	-0.055521197	0.005330506
APR b_7	0.051493605	0.021587466	2.385347311	0.018873084	0.00868485	0.094302359	0.00868485	0.094302359
MAY b_8	0.110183974	0.032265051	3.414963535	0.000910782	0.046201168	0.174166779	0.046201168	0.174166779
JUN b_9	0.201234031	0.041373735	4.863811086	4.10609E-06	0.119188364	0.283279698	0.119188364	0.283279698
JUL b_{10}	0.248534709	0.047894674	5.189193066	1.0502E-06	0.153557777	0.343511642	0.153557777	0.343511642
AUG b_{11}	0.204769114	0.045088947	4.541448151	1.50877E-05	0.115356043	0.294182186	0.115356043	0.294182186
SEP b_{12}	0.204473292	0.037681845	5.426307862	3.77681E-07	0.129748781	0.279197802	0.129748781	0.279197802
OCT b_{13}	0.162676167	0.025015696	6.502963757	2.7997E-09	0.113069104	0.21228323	0.113069104	0.21228323
NOV b_{14}	0.140033042	0.014565829	9.613804865	4.90976E-16	0.111148457	0.168917628	0.111148457	0.168917628
DEC b_{15}	0.042241106	0.011480195	3.679476345	0.00037224	0.019475449	0.065006763	0.019475449	0.065006763

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R SQUARE - The coefficient of determination, which measures the percentage of the variation in the dependent variable that is explained by the independent variables. The Value of R2 will alwas be between 0 and 1.

ADJUSTED R SQUARE - Version of r-squared that has been adjusted for the number of predictors in the model. R-squared tends to over estimate the strength of the association when there are more than one explanatory variables.

SS - *The sum of the squares of the differences between values of y and the average y.*

MS - SS divided by df (degrees of freedom)

F-STATISTIC - If the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables is true, then the F statistic will have come from an F distribution with k (the number of explanatory variables in the model) degrees of freedom in the numerator (15), and n (the number of observations) - k - 1 degrees of freedom in the denominator (104). At the 95% significance level the critical value of the F distribution with 15 and 104 degrees of freedom is 1.75. Because the calculated F value is much larger than the critical value, we can reject the null hypothesis (H0) that there is no linear relationship between the dependent variable and the explanatory variables.

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MULTIPLE REGRESSION ANALYSIS USING EXPONENTIAL TREND MODEL
MONTHLY RESIDENTIAL, COMMERCIAL, AND TOTAL USAGE - JANUARY 2000 THROUGH DECEMBER 2009

Total Company Total 2000-2009

Regression Statistics	
Multiple R	0.97900144
R Square	0.95844382
Adjusted R Square	0.95245014
Standard Error	0.022659446
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	1.231580939	0.082105396	159.9090791	1.34414E-64
Residual	104	0.053398852	0.00051345		
Total	119	1.28497979			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept b_0	0.847531934	0.048519183	17.46797627	1.05588E-32	0.751316576	0.943747291	0.751316576	0.943747291
AvgTemp b_1	0.001746036	0.001072195	1.628469552	0.10645103	-0.000380166	0.003872239	-0.000380166	0.003872239
TotPrecip b_2	0.002710639	0.00326417	0.830422254	0.408202372	-0.003762332	0.00918361	-0.003762332	0.00918361
PDSI b_3	-0.004417872	0.000858258	-5.147484374	1.25409E-06	-0.006119831	-0.002715913	-0.006119831	-0.002715913
CodedMonth b_4	-0.000378294	6.12889E-05	-6.172303904	1.31503E-08	-0.000499832	-0.000256756	-0.000499832	-0.000256756
FEB b_5	-0.022834208	0.010572228	-2.159829425	0.033083273	-0.043799332	-0.001869085	-0.043799332	-0.001869085
MAR b_6	-0.03655977	0.013706938	-2.667245588	0.008871035	-0.063741142	-0.009378398	-0.063741142	-0.009378398
APR b_7	0.036950119	0.019285473	1.915956024	0.058116524	-0.001293697	0.075193935	-0.001293697	0.075193935
MAY b_8	0.092609422	0.028824447	3.212877616	0.001749845	0.035449463	0.149769381	0.035449463	0.149769381
JUN b_9	0.170352522	0.036961821	4.608877955	1.15414E-05	0.097055846	0.243649198	0.097055846	0.243649198
JUL b_{10}	0.202197629	0.042787395	4.725635376	7.21797E-06	0.117348621	0.287046638	0.117348621	0.287046638
AUG b_{11}	0.142614014	0.040280859	3.540490896	0.000598987	0.062735562	0.222492467	0.062735562	0.222492467
SEP b_{12}	0.147603695	0.033663618	4.384665234	2.7876E-05	0.080847479	0.214359911	0.080847479	0.214359911
OCT b_{13}	0.117299614	0.022348132	5.248743563	8.14125E-07	0.072982431	0.161616797	0.072982431	0.161616797
NOV b_{14}	0.089380691	0.013012593	6.868783941	4.88241E-10	0.063576231	0.115185151	0.063576231	0.115185151
DEC b_{15}	0.025631247	0.010255997	2.499147197	0.014013594	0.00529322	0.045969274	0.00529322	0.045969274

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P-VALUE - The observed level of significance, which is the smallest level at which the null hypothesis (H0) can be rejected. Thus we reject the null hypothesis (H0) that the estimate is not statistically different from zero if P is less than α (0.05).

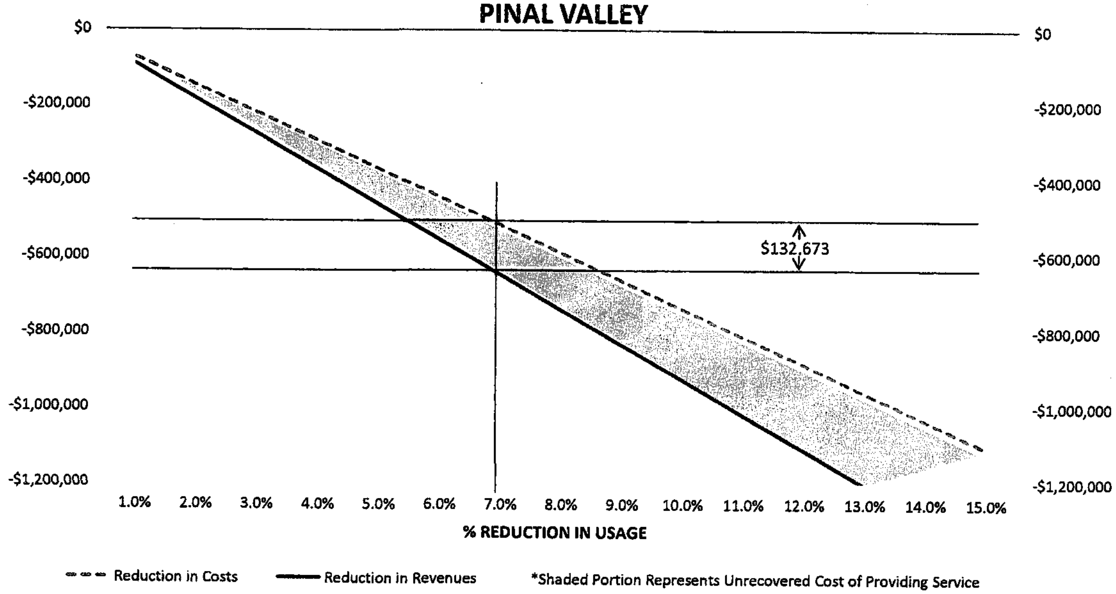
JMR-6

ARIZONA WATER COMPANY
Test Year Ended December 31, 2009
Reduction in Revenues vs. Costs with Inverted Tier Rates

Exhibit JMR-6
Page 1 of 1
Witness: Reiker

Line No.		Residential Cost of Service - Pinal Valley [A] Usage	[B] Cost/Rate	[C] Revenues
1	Total Residential Cost of Service/Revenue Requirement (Sch. G-1, p. 4, col. E, ln. 10)			$ 15,536,812
2				
3	% of Revenues Required from Fixed Charge (Sch. G-1, p. 3, col. B, ln. 48)		52%	$ 8,119,853
4	% of Revenues Required from Commodity Charge (Sch. G-1, p. 3, col. B, ln. 49)		48%	7,416,959
5				
6	Total M Gallons Sold (Sch. G-1, p. 4, col. A, ln. 9)	3,144,597.7		
7				
8	Cost Per M Gallon/Cost-Based Commodity Rate (Sch. G-1, p. 4, col. G, ln. 10)		$ 2.3586	$ 7,416,959
9				
10				
11	Inverted Tier Commodity Rates (break over points at 3,000 & 10,000 gals.)			
12	Tier-1 Commodity Rate	1,085,508.6	$ 1.8953	$ 2,057,333
13	Tier-2 Commodity Rate	1,246,185.5	$ 2.3691	$ 2,952,324
14	Tier-3 Commodity Rate	812,903.7	$ 2.9614	$ 2,407,302
15				$ 7,416,959

REDUCTION IN REVENUES VS. COSTS WITH INVERTED TIER RATES-PINAL VALLEY



Supporting Schedules:

H:\My Documents\Reduction in Revenues vs. costs.xlsx\C2.1
Processing Date: 12/16/2010 1:20 PM

Recap Schedules:

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

W-01445A-10-0517

2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

OF

Thomas M. Zepp

TABLE OF CONTENTS

EXHIBITS

ARIZONA WATER COMPANY

Direct Testimony of

Thomas M. Zepp

I. Introduction and Qualifications

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Thomas M. Zepp. My business address is Suite 250, 1500 Liberty Street, S.E., Salem, Oregon 97302.

Q. WHAT IS YOUR PROFESSION AND BACKGROUND?

A. I am an economist and Vice President of Utility Resources, Inc., a consulting firm. URI provides economic and financial studies related to utility services, as well as valuations of utilities, oil wells, gas wells and other properties for various clients in court cases and administrative proceedings. I received my Ph.D. in Economics from the University of Florida. Prior to jointly establishing our consulting firm in 1985, I was a consultant at Zinder Companies from 1982-1985 and a senior economist on the staff of the Oregon Public Utility Commissioner (now Commission) between 1976 and 1982. Prior to 1976, I taught business and economics courses at the graduate and undergraduate levels.

I have been deposed or testified on various topics before regulatory commissions, courts and legislative committees in twenty-two states, before two Canadian regulatory authorities and before four Federal agencies. In addition to cost of capital studies, I have testified as to incremental costs of energy and telecommunications services, values of utility properties, and appropriate rate designs.

Q. WHAT PREVIOUS COST OF CAPITAL STUDIES HAVE YOU PREPARED?

A. I have submitted studies or testified on cost of capital and other financial issues before the Interstate Commerce Commission, Bonneville Power Administration, and courts or regulatory agencies in Alaska, Arizona, California, Hawaii, Idaho, Illinois, Kentucky, Montana, Nevada, New Mexico, Oregon, Tennessee, Utah, Washington and Wyoming.

My studies and testimony have included consideration of the financial health and fair rates of return for Arizona Water Company ("Arizona Water" or the "Company") as well as Nevada Bell Telephone, Illinois Bell Telephone, General Telephone of the Northwest, Pacific Northwest Bell, U S WEST, Alaska Electric Light and Power, Alaska Power Company, Anchorage Municipal Light & Power, Commonwealth Edison, Idaho Power, Iowa-Illinois Gas and Electric, Northern Illinois Gas, Pacific Power & Light, Portland General Electric, Puget Sound Power & Light, Cascade Natural Gas, Mountain Fuel Supply, Northwest Natural Gas, Anchorage Wastewater Utility, Anchorage Water Utility, Arizona-American Water Company, California-American Water Company, California Water Service, Chaparral City Water Company, Dominguez Water Company, Golden State Water Company, Hawaii-American Water Company, Kentucky-American Water Company, Mountain Water Company, New Mexico-American Water Company, New Mexico Utilities, Inc., Oregon Water Company, Paradise Valley Water Company, Park Water Company, San Gabriel Valley Water Company, San Jose Water Company, Southern California Water Company, Suburban Water System, Tennessee-American Water Company and Valencia Water Company. I have also prepared estimates of the appropriate rates of return for a number of hospitals in Washington, a large insurance company, and U.S. railroads.

Q. DO YOU HAVE OTHER PROFESSIONAL EXPERIENCE RELATED TO COST OF CAPITAL OR COST OF EQUITY ISSUES?

A. Yes. My article, "Utility Stocks and the Size Effect - Revisited," was published in the *Quarterly Review of Economics and Finance*, Vol. 43, Issue 3, Autumn 2003, pp. 578-582. This article is attached as Exhibit TMZ-3. Also, I published an article entitled "Water Utilities and Risk," *Water, the Magazine of the National Association* *of Water Companies*, Vol. 40, No. 1, Winter 1999, and was an invited speaker on the topic of risk of water utilities at the 57th Annual Western Conference of Public Utility Commissioners in June 1998. I presented a paper "Application of the Capital Asset Pricing Model in the Regulatory Setting" at the 47th Annual Southern Economic Association Conference, and published an article "On the Use of the CAPM in Public Utility Rate Cases: Comment," in *Financial Management*, Autumn, 1978, pp. 52-56. I have been a journal referee for *Financial Management* and the *International Review of Economics and Finance*. While on the staff of the Oregon PUC, I also established a sample of over 500,000 observations of common stock returns and measures of risk, and conducted a number of studies related to the use of various methods to estimate costs of equity for utilities. I was invited to Stanford University to discuss that research in 1980. Exhibit TMZ-1, attached, provides a more complete description of my past experience.

II. <u>Purpose of Testimony, Principles, Summary and Conclusion</u>

Q. WHAT IS THE SUBJECT OF YOUR TESTIMONY IN THIS PROCEEDING?

A. I have determined the cost of equity for Arizona Water in this proceeding. My study is based on market data available to investors in early November 2010.

Q. PLEASE DESCRIBE GENERALLY THE APPROACH AND GUIDING PRINCIPLES YOU FOLLOWED IN DEVELOPING THE COST OF EQUITY RECOMMENDATIONS YOU PRESENT IN THIS CASE.

A. I selected appropriate approaches with the goal of reaching a recommended rate of return that is fair to both the Company and its ratepayers. In working through the processes required for each of the various methodologies I employ, I approach each choice that requires judgment and experience by making choices that are the most likely to reflect actual circumstances so that the results of the analyses are reliable indicators of the cost of equity for Arizona Water.

Q. WHAT STEPS DID YOU TAKE TO MAKE YOUR ESTIMATES OF THE COST OF EQUITY?

A. I took the following three steps to make my estimates of the cost of equity:

STEP 1: I first determine the cost of equity for a sample of seven publicly-traded water utilities with the discounted cash flow ("DCF") model, the capital asset pricing model ("CAPM") and two versions of the risk premium ("RP") model, which provide checks on the CAPM estimates. Consistent with past Arizona Corporation Commission ("ACC") or ("Commission") Decisions, I give a 50 percent weight to the DCF estimates and a 50 percent weight to the CAPM estimates. I conclude that the appropriate cost of equity for the sample group of water utilities in this proceeding falls in a range of 10.9 percent to 12.3 percent. The application of Step 1 is discussed in detail in Sections III and IV below.

STEP 2: I next determine a risk premium to compensate Arizona Water for its additional business risks. In Section V, I address the specific additional business risks faced by Arizona Water. My assessment of the specific additional business risks is based on the following:

(a) *The Size of the Company*. Based on three measures of size, Arizona Water is smaller than each of the water utilities used to determine benchmark equity costs, and is between 8 percent and 11 percent as large as the average water utility in the sample. Smaller water utilities are more risky than larger ones, and thus investors would conclude that an equity investment in Arizona Water is more risky due to its comparatively smaller size.

(b) *Use of Historical Test Year.* The Company faces risk that stems from the use of an historical test year with limited opportunities for out-of-period adjustments.

(c) *Risk Relative to Other Companies.* For this risk I rely on an analysis presented by the California PUC Division of Ratepayer Advocates ("DRA") Staff in which two measures of relative risk are used to determine risk premiums the DRA Staff recommended for water utilities in a 2009 generic Return On Equity ("ROE") case.

Based on these observations and analyses, and my professional experience and judgment, I determine that the additional business risks faced by Arizona Water increase its cost of equity by no less than 50 basis points above the ROE required by a sample of seven publicly traded water utilities (the "water utilities sample") used to make benchmark equity cost estimates.

STEP 3: Finally, from the results of Steps 1 and 2, I determine the cost of equity for Arizona Water. I conclude the cost of equity for the Company falls in a range of 11.4 percent to 12.8 percent, and that the mid-point of that range of 12.1 percent is a reasonable required rate of return on equity for Arizona Water. The application of Step 3 is discussed in detail in Section VI below.

Q. HAVE YOU PREPARED ANY EXHIBITS TO ACCOMPANY YOUR TESTIMONY?

A. Yes. I have prepared four exhibits, which are attached to this testimony:

Exhibit TMZ-1 is my resume.

Exhibit TMZ-2 contains 20 tables that support my testimony. Generally, I refer to the pages in Exhibit TMZ-2 as Tables 1 through 20.

Exhibit TMZ-3 is the *Quarterly Review of Economics and Finance* article I wrote, referenced above, that addresses the issue of smaller utilities being more risky than larger ones.

Exhibit TMZ-4 is selected pages from testimony filed by the DRA of the California PUC in Application No. 09-05-001.

Q. PLEASE DISCUSS WHAT IS MEANT BY A FAIR RATE OF RETURN.

A. A fair rate of return is what is achieved when a utility has rates and rate adjustment mechanisms that allow owners of the utility a reasonable opportunity to recover the cost of providing service and to earn their cost of equity. The cost of equity of an enterprise is measured by the rate of return that funds invested in a particular utility's equity could earn if such funds were invested elsewhere in an equally risky asset. In 1923, the U.S. Supreme Court set forth the following standards concerning fair rates of return in the *Bluefield Waterworks* decision:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. A rate of return may be reasonable at one time and become too high or too low by changes affecting opportunities for investment, the money market and business conditions generally. 262 U.S. 679, 692-93 (1923).

In the *Hope Natural Gas* decision issued in 1944, the U.S. Supreme Court stated the following regarding the return to owners of a company:

> [T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. *Hope Natural Gas* 320 U.S. 591, 603.

In 1989, in *Duquesne Light Co. v. Barasch*, the U. S. Supreme Court also recognized two important economic concepts related to fair rates of return. First, it found that the cost of common stock was related to fair rates of return ". . . the return required to sell such stock upon reasonable terms in the market." 488 U.S. at 310, n. 7. The source of funds that would be used to buy shares of common stock, however, does not change the cost of equity. The owners of the utility could be individuals who bought stock on margin, or bought it with 100 percent of their own funds. Owners could also be a partnership, a developer, a holding company or some other type of entity. The status of the owners of the stock does not change the underlying cost of equity. For companies that have no publicly-traded common stock, like Arizona Water, as well as those that do, the U. S. Supreme Court has stated that the test of a fair rate of return is tied to the issue of new shares of common stock.

Second, the U. S. Supreme Court found that regulatory commissions may need to adjust the risk premium element of the rate of return to provide a fair return. It stated:

> [W]hether a particular rate is "unjust" or "unreasonable" will depend to some extent on what is a fair rate of return given the risks under a particular rate setting system . . . . 488 U.S. 299, 310.

Therefore, in determining an appropriate rate of return, consideration must be given to the specific risks created by the nature and degree of regulation to which the utility is subject, in addition to examining general economic and financial data for utilities. To meet this requirement, the additional risk faced by Arizona Water should be recognized when setting the fair rate of return for the Company.

Q. IS THERE A PARTICULAR RATE SETTING SYSTEM USED IN ARIZONA THAT SHOULD BE RECOGNIZED WHEN SETTING ARIZONA WATER'S AUTHORIZED ROE?

A. Yes. The Arizona Constitution, Arizona appellate court decisions and the Commission's policies and practices have created a particular rate-setting system that limits the ability of Arizona utilities to earn a fair return on the value of their property devoted to public service. Specifically, the Commission's method of rate-setting uses historic test periods with limited opportunities to make appropriate out-of-period adjustments and has limitations on recovery of unavoidable, prudently incurred, costs without going through a full general rate case ("GRC"). Similar limitations on rate-setting systems are not required in jurisdictions, such as California and Pennsylvania, which use forecasted or projected test periods to determine rates and have other rate-adjustment mechanisms that allow utilities to recover prudent costs incurred on behalf of ratepayers. This is not to say that Arizona's mechanisms are wrong, but only that the equity market would adjust its expected rate of return in recognition of these factors.

Q. DOES THIS RATE-SETTING SYSTEM REQUIRE AUTHORIZED ROEs FOR ARIZONA WATER TO BE HIGHER THAN THE COST OF EQUITY FOUND TO BE REASONABLE FOR WATER UTILITIES OPERATING IN OTHER JURISDICTIONS?

A. Yes. Investors expect a reasonable opportunity to earn the cost of equity on average. With the particular rate setting system in Arizona, however, investors can expect to earn less than the cost of equity on average unless the authorized ROE is increased by enough to give the investors a reasonable opportunity to earn the target cost of equity, and that increased ROE therefore becomes the utility's cost of equity for rate making purposes.

Even if Arizona Water's cost of equity were the same as the cost of equity of the water utilities sample, the Company does not have as good an opportunity to earn that cost of equity as the utilities in the water utilities sample that are regulated under more flexible rate-setting systems. As a result, Arizona Water's authorized ROE should be increased by an amount that gives the Company the same opportunity to earn its cost of equity as is available to the benchmark water utilities operating under more flexible rate-setting systems. This result is consistent with the holding in Duquesne Light Co., discussed above. By authorizing an appropriate risk premium for Arizona Water to arrive at the authorized ROE, the Commission does not give Arizona Water a higher cost of equity than the sample water utilities; rather, the higher authorized ROE is required to give Arizona Water the *same* opportunity - as required by the U. S. Supreme Court - to earn its cost of equity. With differences in rate-setting systems, the only way to give Arizona Water the same opportunity to earn whatever return is found by the Commission to be the Company's cost of equity is to increase the authorized ROE by an appropriate amount. If the rates being set for Arizona Water do not meet this expectation, but the rates being set for the water utilities sample do, the Company has not been given a reasonable opportunity to maintain the utility's financial integrity, does not earn a cost of equity commensurate with other enterprises having corresponding risks, and will not attract needed capital on reasonable terms.

Q. AT PAGES 38-39 OF DECISION NO. 71845, THE COMMISSION STATED IT IS THE COMMISSION'S OBLIGATION TO CONSIDER THE INTERESTS OF RATEPAYERS WHEN BALANCING THE INTERESTS OF PARTIES. IS THIS OBLIGATION CONSISTENT WITH SETTING RATES DESIGNED TO GIVE ARIZONA WATER A REASONABLE OPPORTUNITY TO EARN ITS COST OF EQUITY?

A. Yes. The cost of equity is a cost of service and thus it is reasonable for the Commission to set rates that allow a utility a fair opportunity to earn that required return. Rates should not be set to guarantee recovery of that cost, but should be set to allow the utility an opportunity of recovering this cost of service in the future. If the authorized ROE is set too high, the utility may earn more than that cost of equity. In like manner, if the authorized ROE is set too low, i.e., at a level which will produce a return below the cost of equity, that return does not meet the tests set forth by the U. S. Supreme Court. In such a situation, the result is not only unfair to investors but will ultimately harm ratepayers, since the utility would be unable to attract capital on reasonable terms to allow it to provide reliable public utility service. In such a situation, the cost of borrowing may increase (leading to future increases in rates) and the utility may not be able to attract capital necessary to maintain an appropriate level of service to its customers. Considering the interests of ratepayers does not mean ignoring, or even discounting, the importance of allowing the utility the opportunity to earn its cost of equity. The ratepayers are entitled to assurance that the ROE is not set too high, but it is entirely consistent with the ratepayers' best interests that it not be set too low, in order to assure the health and viability of the utility enterprise.

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. My findings and recommendations are the following:

1. Benchmark Cost of Equity. The market cost of equity faced by the water utilities sample (not adjusted for risks specific of Arizona Water) falls in a range of 10.9 percent to 12.3 percent, based on the following:

a. DCF model estimates for the water utilities sample indicate the benchmark cost of equity falls in a range of 11.6 percent to 12.4 percent with an average of 12.0 percent; and

b. Estimates of costs of equity derived with the CAPM indicate the benchmark cost of equity for the water utilities sample falls in the range of 10.2 percent to 12.2 percent with an average of 11.2 percent.

Checks of the CAPM estimates derived from risk premium models indicate the benchmark cost of equity for the water utilities sample falls in the range of 10.6 percent to 12.2 percent, with an average of 11.4 percent. Thus, these checks corroborate the average CAPM estimate.

2. Business Risk Adjustment. Because Arizona Water has greater business risks than the water utilities sample used to determine the benchmark cost of equity estimates, the Company requires a risk premium of at least 50 basis points, based on the following.

a. Three studies discussed in Section V indicate that comparatively smaller water utilities, such as Arizona Water, have a risk premium that falls in a range of 99 to 135 basis points;

b. State-specific factors in Arizona increase Arizona Water's risk; these factors include a legal constraint on all Arizona water utilities that limits the ability to obtain rate increases outside general rate cases and a Commission requirement that utilities use an historic test period with limited opportunities to make out-of-period adjustments. A study of these state-specific risks of Arizona Water compared to relative risk of other water utilities indicates it requires a risk premium in the range of 32 to 61 basis points.

3. Combining the range of cost of equity estimates for the water utilities sample and a risk premium of 50 basis points, I conclude Arizona Water's required ROE falls in a range of 11.4 percent to 12.8 percent and recommend it be authorized an ROE of no less than 12.1 percent. *See* Table 20.

Q. PLEASE PUT YOUR BENCHMARK COST OF EQUITY ESTIMATES IN PERSPECTIVE.

A. The recession and limited access to credit markets that have been ongoing for over two years continues. Value Line recently noted that industrial activity has taken a small step backward, and states "building activity is still weak, with data showing that housing starts flattened in September, while building permits fell," and the foreclosure crisis will only put more troubled properties on the market. Value Line, Selection & Opinion, October 29, 2010. While other sectors appear to be holding their own, Value Line has not ruled out a double-dip recession, noting that if housing and unemployment do not bottom out next year, we could be thrown into a second recession (the double dip). Value Line, Selection & Opinion, September 3, 2010. While there is no consensus about the likelihood of a double dip recession, investors continue to perceive considerable risk in the markets, and it is that perception of risk that impacts the cost of equity capital.

As a result of this uncertainty and risk, investors continue to price Treasury securities at relatively high levels (and thus bid down yields) compared to corporate bonds and stocks. Table 1 shows this "flight to quality" - in which investors shun corporate bonds and stocks in favor of the lower risk Treasuries - led to a spread between Baa bonds and Treasury rates during 2008 and 2009 that was almost double the average spread during 1990 to 2007. Table 2 shows that this high level of difference between Baa bond rates and Treasury security rates is expected to continue into the period 2011 to 2013, during which new rates for Arizona Water will be in effect. The predicted spread between rates for long-term Treasuries and Baa corporate bonds continues to be higher than the average spread during the period 1990 to 2007.

III. Cost of <u>Equity Estimates Based on the DCF Model</u>

Q. HOW SHOULD THE AUTHORIZED COST OF EQUITY FOR ARIZONA WATER BE DETERMINED?

A. To estimate the cost of equity, analysts require comparable market data that reveal investors' required returns; however, such data are not available for Arizona Water. There are no publicly-traded companies, let alone publicly-traded water utilities, that are perfectly comparable to Arizona Water. Costs of equity based on data from the publicly-traded water utilities sample, however, are most appropriate for use here since they are from utilities that provide the same services and thus provide a useful starting point in the determination of Arizona Water's costs of equity. In this section and in Section IV, I discuss costs of equity required in the first step of the three step process I laid out above.

Q. PLEASE DISCUSS THE WATER UTILITIES SAMPLE YOU HAVE USED IN YOUR COST OF EQUITY ANALYSES.

A. My water utilities sample includes American States Water, American Water Works, Aqua America, California Water Service Group, Connecticut Water Service, Middlesex Water and SJW Corp. Six of these seven water utilities are the same publicly-traded water utilities that the ACC Staff relied on to determine benchmark equity costs in the W-01445A-08-0440 Rate Case and other recent rate cases (such as in Docket No. W-01303A-09-0343, dated March 8, 2010) for Class A and B water utilities. The seventh water utility making up the water utilities sample is American Water Works, which is the largest water utility in the United States. It was recently spun off by its parent and is now again a publicly-traded company. To the extent the data permit, I relied upon this full sample of seven water utilities to reach my benchmark equity cost estimates. Table 3 lists bond ratings, common equity ratios, percentages of regulated revenues from water utility operations, number of customers, operating revenues, net plant and market values for each of the utilities in the water utilities sample as reported by AUS Utility Reports in October 2010 and in 2009 SEC Form 10-K reports. The table also reports comparable values for Arizona Water, if they are available. Table 4 lists Value Line beta estimates that are available for the utilities in the water utilities sample. Beta estimates are estimates of market risk in the CAPM. Table 5 lists available historical growth data for utilities in the water utilities sample during the last fifteen years.

Q. DO YOU HAVE ANY CONCERNS WITH USING A SAMPLE OF THIS SIZE TO DETERMINE YOUR BENCHMARK COST OF EQUITY ESTIMATES?

A. Yes, I have some concerns with relying upon a sample of seven water utilities to reach cost of equity estimates but I recognize that this sample represents a fuller sample of water utilities than that used by ACC Staff in the past, since it also includes American Water Works. With a smaller sample size, it is important to exercise judgment and careful analysis with respect to the outcomes of any particular model and compare such results with information from a number of other models to evaluate the reasonableness of the results. When any method produces cost of equity results that seem extreme or unexpected, it is important to evaluate those results carefully and exercise judgment to ensure that the results are reasonable. To do so here, I present six alternative models.

Q. WHAT COSTS OF EQUITY ESTIMATES DO YOU PRESENT IN THIS SECTION OF YOUR TESTIMONY?

A. In this section of my testimony, I estimate the Company's cost of equity using the constant growth DCF model with data for the water utilities sample as shown in Table 3. That calculation is detailed in Tables 7, 8, 9, 10, and 11. In Section V, I explain why a risk premium of no less than 50 basis points should be added to these benchmark equity cost estimates to account for Arizona Water's utility-specific risks. After adding this risk premium to these equity cost estimates, I find the indicated DCF equity cost estimate for Arizona Water falls in a range of 12.8 percent to 12.9 percent when conceptually consistent forecasts of growth are used to prepare the analysis. If more conservative estimates of growth are adopted, the indicated cost of equity is 12.1 percent.

Q. PLEASE EXPLAIN THE DCF METHOD OF ESTIMATING THE COST OF EQUITY.

A. The constant growth DCF model computes the cost of equity as the sum of an expected dividend yield ("D_1/P_0") and expected dividend growth ("g"). The expected dividend yield is computed as the ratio of next period's expected dividend ("D_1") divided by the current stock price ("P_0"). Generally, the constant growth model is computed with formula (1) or (2):

(1) Cost of Equity = $D_0/P_0 \times (1 + g) + g$

(2) Cost of Equity = $D_1/P_0 + g$

Where D_0/P_0 is the current dividend yield and D_1/P_0 is found by increasing the current yield by the growth rate. The DCF model is derived from the valuation model shown in equation 3 below:

(3) $P_0 = D_1/(1+k) + D_2/(1+k)^2 + . + D_\infty/(1+k)^\infty$,

Where k is the cost of equity, P_0 is the current stock price, D_1, D_2, . D_∞ are the cash flows expected to be received in periods 1, 2, . . . ∞, respectively. In the case of an expected acquisition or merger, P_0 may increase because investors expect a premium price (be it cash or the value of securities offered in a merger) that would have a present value larger than the present value of the growth in dividends and earnings. During the last ten years, investors received premiums when mergers and acquisitions of water utilities occurred.

Q. HOW DID YOU COMPUTE CURRENT DIVIDEND YIELDS?

A. My current dividend yield (D_o /P_o) estimates are based on the 6-month and 3-month average dividend yields for the utilities in the water utilities sample for periods ending in October 2010, and reflect the time value of money. They are presented in Table 7.

The time value of money should be taken into account when determining dividend yields. This adjustment is required because the basic model assumes dividends are paid once per year, but investors actually receive dividend payments on a quarterly basis. If, for example, a utility paid a dividend of $100 per year, investors would prefer to receive dividend payments of $25 per quarter rather than one payment of $100 at the end of the year. The time value of money adjustment compensates for the fact that utilities pay dividends more frequently than once per year.

Q. TURN TO YOUR ESTIMATES OF GROWTH. DO YOU HAVE ANY CONCERNS ABOUT USING PAST RECORDED DATA TO DETERMINE GROWTH ESTIMATES FOR THE DCF MODEL?

A. Yes. The DCF model requires the best available estimates of growth that investors expect in the future. Analysts' forecasts of future earnings per share ("EPS") growth provide those best available estimates. Comparisons of the data in Table 5, Table 8 and Table 9 show a negative bias in DCF estimates could occur if growth rates for DCF equity cost estimates are partially based on past growth in dividends per share ("DPS"), past growth in EPS and past growth from retained earnings and sales of shares of common stock above book value. In fact, investors now expect higher growth in the future than is indicated by historical data and my DCF model avoids placing too much emphasis on historical data. I have five observations in this regard:

First, an analysis performed by Gordon, Gordon and Gould found that a consensus of analysts' forecasts of EPS growth provided better forecasts of growth for the DCF model than did measures of growth based on past recorded data. They concluded it is logical for financial institutions and investment analysts to take such historical information into account together with more recent information when they determine their forecasts for the future. (David A. Gordon, Myron J. Gordon, and Lawrence I. Gould "Choice Among Methods of Estimating Share Yield," *Journal of Portfolio Management* (Spring 1989), pp. 50-55). They further concluded that to the extent past, recorded results provide useful indicators of future growth prospects, the forecasts should already incorporate the past and any further recognition of the past would be unnecessary and duplicative.

Second, evidence in Table 5, Table 8 and Table 9 shows investors expect more rapid growth in the future than in the past. Table 8 is a compilation of past growth rates reported by the California PUC Staff in various GRCs during the period 1992 to 1998 and the period 2000 to 2007. In the earlier period, analysts expected approximately the same growth in the future as had occurred in the past. During this earlier period and under conditions that existed at that time, past growth was a reasonable proxy for growth investors expect in the future. But in the more recent period, Table 8 shows that analysts expect future growth rates to be higher than historic growth rates. Additionally, a comparison of data in Table 5 and Table 9 shows investors expect higher growth in the future than growth that occurred during the past fifteen years.

Third, analysts' forecasts of growth are readily available on the Internet and are easily accessed by knowledgeable investors when they form their opinions about anticipated future growth.

Fourth, it is reasonable to exclude measures of past DPS growth as an indicator of future sustainable growth for two reasons.[1] One reason is that only one major financial institution provides forecasts of DPS growth using past DPS growth. If investors thought such DPS forecasts were valuable, more financial institutions would provide the forecasts. Another reason is that EPS are expected to grow more rapidly than DPS. Therefore, retained earnings are expected to increase, enabling DPS to grow faster in the future than in the past. As a result, past DPS growth is an extremely poor indicator of future long-term growth required in the DCF model.

Fifth, if investors believe future growth will be similar to past growth, then average growth in stock prices and book value per share ("BVPS") must also be considered. This is reasonable because investors know that, in equilibrium, common stock prices, BVPS, DPS and EPS will all grow at the same rate, and investors would take into account information about changes in stock prices and growth in BVPS when they price utilities' stocks. Table 5 shows that past growth in EPS, stock prices and BVPS have averaged 6.9 percent for the last fifteen years. If the Commission determines that some weight should be given to past growth

[1] The California PUC agreed in Decision 06-08-011 (California Water). In that case, the California Commission accepted California Water's testimony and removed historical DPS growth from the overall average growth rate calculation.

when determining DCF estimates, it should rely on averages of past growth in EPS, BVPS and stock prices reported in Table 5.

Q. HOW DID YOU ESTIMATE GROWTH RATES?

A. My primary DCF analysis relies on analysts' consensus estimates of growth reported by four reliable and accepted institutions - Zacks, Yahoo! Finance, Reuters, and Value Line. Reports published by Value Line are generally available in public libraries. The other three sources provide forward-looking estimates of growth that are readily available to investors on the Internet.

Q. WHERE DO YOU REPORT THE ANALYSTS' FORECASTS?

A. Table 9 reports the analysts' forecasts of future growth. The first three columns of Table 9 show analysts' consensus forecasts of future EPS growth rates reported by *Zacks*, *Yahoo! Finance,* and *Reuters* on the Internet on November 3, 2010 for the utilities in the water utilities sample. The fourth column shows comparable *Value Line* estimates of growth for the four larger water utilities on October 22, 2010. Value Line does not make such forecasts for companies in the Small and Mid-Cap Edition, but instead reports analysts' forecasts of future EPS growth if they are available. No analysts' forecasts were reported in the October 22, 2010 Value Line reports for the three utilities in the Small and Mid-Cap Edition for Connecticut Water Service, Middlesex Water and SJW Corp.

Q. HOW DID YOU ESTIMATE GROWTH FOR THE SAMPLE?

A. I estimated growth by determining a weighted average of the available forecasts of 8.4 percent, which I adopt for my analysis. In making this weighted average estimate, I give equal weight to each of the forecasts reported in Table 9. This weighting method gives more weight to forecasts for the utilities followed by more analysts.

Q. HOW DID YOU UTILIZE THE INFORMATION ON DIVIDEND YIELDS AND ESTIMATED FUTURE GROWTH TO MAKE YOUR INITIAL DCF ESTIMATES FOR THE WATER UTILITIES SAMPLE?

A. I combined my estimate of average future growth of 8.4 percent shown in Table 9 with the range in dividend yields from Table 7 with the constant growth DCF model specified in equation (1) to compute the DCF cost of equity range for the water utilities sample. Table 10 shows that the application of this specification of the DCF model indicates a cost of equity range of 12.3 percent to 12.4 percent for the water utilities sample. This range of costs of equity for the water utilities sample does not, however, account for the additional risk faced by Arizona Water. In Section V below, I explain why a risk premium of no less than 50 basis points is required by Arizona Water. Combining that risk premium with this primary DCF estimate of the cost of equity range for the water utilities sample indicates the cost of equity for Arizona Water falls in a range of 12.8 percent to 12.9 percent.

Q. PLEASE EXPLAIN YOUR SECOND DCF ESTIMATE.

A. My second DCF estimate is based on the concepts used by ACC Staff to determine DCF costs of equity in past cases. Those concepts assume that investors consider both past growth and projections of growth in making DCF cost of equity estimates. While the Staff approach does not take into account the logic and quantitative analysis reported by Gordon et. al. discussed above, the Commission has relied on it in the past and thus I include it as a second DCF approach.

In implementing this approach, I used the estimates of projected growth in Table 9 and the average of the estimates of past growth during the last fifteen years provided in Table 5 to determine my estimates of average past growth. With respect to projected growth rates, the estimates I rely upon are based on averages reported by the four financial institutions identified above. With respect to past growth, in equilibrium, we expect EPS, DPS, BVPS and common stock prices to grow at the same rate, but recognize that past DPS growth is a poor indicator of the future equilibrium growth that investors can reasonably expect.

Q. WHERE DO YOU REPORT THE RESULT OF YOUR SECOND DCF ANALYSIS?

A. It is reported in Table 11. This additional analysis indicates the benchmark cost of equity for the water utilities sample is 11.6 percent which, when combined with a 50 basis point risk premium, indicates a cost of equity for Arizona Water of 12.1 percent. I used the dividend yields from Table 7, which I used in my first DCF analysis, and average growth rates determined in Table 5 (6.9 percent) and in Table 9 (8.4 percent), to get the average growth rate of 7.7 percent shown in Table 11.

IV. Cost of <u>Equity Estimates Based on the CAPM and Risk Premium Analyses</u>

Q. WHAT IS THE CAPITAL ASSET PRICING MODEL?

A. The basic or traditional CAPM is a model that was developed by William Sharpe and John Lintner in the mid-1960s. It was tested with data for common stocks in the early 1970s and is now a common topic in college finance textbooks. CAPM is a specific application of the risk premium approach. The traditional version of CAPM provides that the cost of equity is explained by the following relationship:

(4) Cost of Equity = RF + β x MRP,

where RF is the return on a risk-free asset (an asset with a "zero" beta), the beta ("β") is the relative risk of the security at issue and the market risk premium ("MRP") is the additional return that is required by investors to hold an average risk asset instead of the risk-free asset. In this RP model, the risk premium for an enterprise is determined by multiplying the beta for the enterprise times the MRP. Beta measures the sensitivity of a stock price to changes in market returns. Market values of low beta, or less risky, stocks are expected to decline less than the market values of stocks with betas of 1.0 (average risk stocks) when the market falls.

Morningstar (formerly Ibbotson Associates) explains that the appropriate choice for RF is a return that is no less than the expected return for long-term Treasury securities:

> The horizon of the chosen Treasury security should match the horizon of whatever is being valued. When valuing a business that is being treated as a going concern, the appropriate Treasury security should be that of a long-term Treasury bond. Note that the horizon is a function of the investment, not the investor. If the investor plans to hold a stock in a company for only five years, the yield on a five-year Treasury note would not be appropriate since the company will continue to exist beyond those five years...
>
> Companies are entities that generally have no defined life span; when determining a company's value, it is important to use a long-term discount rate because the life of the company is assumed to be infinite. Morningstar, *Ibbotson SBBI 2010 Valuation Yearbook*, pages 44, 55.

For consistency, the MRP is also computed as the expected difference between returns for the market and the long-term Treasury security. Other versions of the CAPM include not only beta risk but also variables designed to reflect risks related to size of companies and other factors. Additionally, some alternative versions of the CAPM reflect empirical evidence that a correct value for RF is expected to be in excess of the yield on long-term Treasury securities. (See Morin, *New Regulatory Finance*, 2006, pages 189-191)

Q. PLEASE TURN TO YOUR RISK PREMIUM ("RP") COST OF EQUITY ESTIMATES. HOW MANY RP ANALYSES HAVE YOU MADE IN THIS CASE?

A. I have made two RP analyses based on the CAPM and used two additional RP methods to provide checks on the CAPM estimates. The CAPM is a specific version of the more general risk premium approach. My CAPM estimates are based on the traditional CAPM and two alternative estimates of the MRP. With the extreme volatility in equity markets at this time, it is difficult to determine what MRP is expected and required by investors. Given this uncertainty with the results of the CAPM, I rely on a range of MRP estimates and two other RP analyses to provide checks on the reasonableness of estimates made with the results derived from the CAPM analyses.

Q. WHERE DO YOU PROVIDE YOUR CAPM ANALYSES?

A. They are provided in Tables 12 and 13. ACC Staff relied on two CAPM estimates in recent testimony. See Staff testimony in Docket No. W-01303A-09-0343, dated March 8, 2010. Staff's methods are based on a current market risk premium and a long-horizon average market risk premium but use different measures of the risk-free rate. My CAPM estimates also rely on the long-horizon average MRP and an estimate of the current MRP, but are based on the same, conceptually more appropriate measure of RF.[2]

Q. PLEASE DISCUSS THE CAPM ESTIMATE IN TABLE 12.

A. The CAPM estimate is based on an RF (risk-free asset return) of 5.03 percent from Table 2, an average beta of 0.76, taken from Table 4, and an estimate of the long-horizon average market risk premium of 6.7 percent. The 6.7 percent MRP is the long-horizon MRP reported by Morningstar in Table 5-1 of Morningstar, *Ibbotson SBBI 2010 Valuation Yearbook*. Based on this data, the CAPM estimate indicates a cost of equity of 10.2 percent for the water utilities sample and a cost of equity of 10.7 percent for Arizona Water. *See* Table 12.

Q. DO YOU HAVE ANY CONCERNS WITH THIS CAPM ESTIMATE?

A. Yes. I have two concerns. First, based on the empirical results presented by Morningstar in Ibbotson SBBI 2010 Valuation Yearbook, I expect the beta estimate for Arizona Water would be greater than .0.76, if it were known. The Morningstar

[2] Morin reports a number of empirical studies that found the value for RF should be higher than the long-term Treasury rate. Morin, *New Regulatory Finance*, 2006, pages 190. Utilities typically have betas less than 1.0. With a beta less than 1.0, the empirical results reported by Morin means the CAPM will produce negatively biased estimates of the cost of equity even if the long-term Treasury rate is adopted in the analysis.

evidence shows beta estimates are expected to increase as companies become smaller. Arizona Water is smaller than all of the water utilities in the water utilities sample and, as a result, I expect the CAPM estimate in Table 12 is biased downward due to it being based on the average beta for the water utilities sample.

My second concern is that there is substantial evidence in the market indicating investors now require a MRP that is higher than the long-horizon average estimate of 6.7 percent. Value Line recently stated "investors are on edge" and that there is currently an elevated level of volatility in financial markets. Even though Value Line is not predicting a double-dip recession (in which we have another recession before we fully recover from the last one), "the margin for error is lessening," and it opines that any delays in the turn-around in housing and unemployment could indeed throw us back into recession. (Value Line, Selection & Opinion, September 3, 2010) The important thing to note is not whether one agrees or disagrees with whether the economy is heading for a double dip recession but that such market indicators are evidence that many investors are worried about that potential, which increases volatility and risk.

In addition to the DCF cost of equity estimates presented in Section III, evidence from at least the following two sources indicates the required MRP is higher than 6.7 percent:

First, the method ACC Staff uses to determine a current market risk premium indicates the MRP above my forecast of the long-term Treasury rate is 9.5 percent at this time. As of October 29, 2010, Value Line forecasts the appreciation potential for 1700 stocks it follows in its Standard Edition is 60 percent during the next 3 to 5 years, an annual rate of appreciation of 12.5 percent. Once I combine the expected dividend yield (2.1 percent over the next 12 months) with the annual share growth rate (12.5 percent) that Value Line projects for all dividend paying stocks, the indicated expected market return is 14.6 percent. With an expected long-term Treasury rate of 5.1 percent (from Table 2), the indicated MRP for the next several years is 9.5 percent. See Table 14.

A second source indicating investors currently require a MRP in excess of the long-term average of 6.7 percent is an average of Value Line's forecasts for its Industrial Composite ("IC"). At the present time, the IC consists of 886 industrial, retail and transportation companies which comprise 78 of Value Line's 98 industry groups. Financial data and stock market values for these companies have been pooled as if they belong to one large corporation. Given the breadth of the industry groups considered in the IC analyses, the risk premium for this group of companies will be similar to the MRP for the market as a whole. I performed 38 DCF analyses using data reported by Value Line for the IC during the period 1984 to 2010. See Table 15. To compute growth rates, I averaged Value Line's forecasts of EPS growth and future growth from retained earnings for each of those Value Line studies. Over the entire period, the average indicated risk premium was 6.5 percent—an average close to the long-horizon average MRP of 6.7 percent used to perform the CAPM analysis in Table 12. During the last five years, however, the indicated average of expected risk premiums is 9.4 percent. These estimates of 9.5 percent and 9.4 percent indicate investors require a MRP in excess of 6.7 percent.

Q. WHAT VALUE FOR THE MRP DID YOU ADOPT FOR YOUR SECOND CAPM ANALYSIS?

A. I adopted the five-year average risk premium for the IC of 9.4 percent for the second estimate of the MRP. This value is less than the 9.5 percent MRP indicated with my application of a method similar to the one ACC Staff typically uses to estimate a current MRP and thus is a more conservative estimate of the current MRP. When this estimate of the MRP is combined with the beta of 0.76 (from Table 4) and RF of 5.03 percent (from Table 2), the indicated CAPM cost of equity for the water utilities sample is 12.2 percent and the indicated cost of equity for Arizona Water is 12.7 percent. See Table 13.

Q. ARE YOU SURPRISED THAT THE CAPM PRODUCES SUCH A WIDE RANGE OF COST OF EQUITY ESTIMATES?

A. No. The 200 basis point range of costs of equity for the water utilities sample can be explained, in part, by the continued volatility in the stock market. It is very difficult to judge what investors currently require for a MRP. This uncertainty about the MRP creates a major concern with application of the traditional CAPM. As a result, I adopt an average of my two CAPM estimates of 11.2 percent as my CAPM estimate, and conduct two checks on the reasonableness of the 11.2 percent ROE estimate with other risk premium approaches.

Q. ARE OTHER RISK PREMIUM APPROACHES WIDELY USED BY FINACNIAL ANALYSTS IN REGULATORY PROCEEDINGS?

A. Yes. Dr. Roger Morin devotes Chapter 4 of his 2006 book, *New Regulatory Finance*, to a discussion of various risk premium approaches. Morin observes that risk premium methods have been presented in regulatory proceedings for many years. (Page 107) He also states that "Risk premium analyses are widely used by analysts, investors, and expert witnesses and are widespread in investment community reports." (Page 108) Morin further explains that the risk premium approach to estimating the cost of equity derives its usefulness from the simple fact that while equity return requirements cannot be readily quantified at any given time, the returns on bonds can. Thus, if the risk premium is known, it can be used to produce a useful estimate of the cost of equity. (Page 108)

I present two additional RP approaches below. Just as with the CAPM, these RP approaches recognize bonds are less risky than stocks but determine risk premiums in some way other than by multiplying a beta times an estimate of the MRP. Given the difficulty with the determination of the MRP currently expected by investors, these approaches provide alternative cost of equity estimates that confirm that an 11.2 percent cost of equity estimate (made with CAPM) is reasonable at this time.

Q. WHERE DO YOU REPORT YOUR OTHER RISK PREMIUM ANALYSES?

A. They are reported in Tables 16 and 17. In Table 16, I present a version of the risk premium method adopted by the California PUC Staff, in which I adopt authorized ROEs as proxies for costs of equity. Table 17 presents the second risk premium approach, in which average annual estimates of the cost of equity for water utilities are based on annual cost of equity estimates determined with the DCF model.

Q. PLEASE EXPLAIN THE ANALYSIS IN TABLE 16.

A. This first analysis is a modified version of the method used by California PUC Staff in a number of cases. The proxies for the average annual costs of equity in this analysis are averages of available estimates of authorized ROEs for the seven utilities in the water utilities sample as reported by CA Turner/AUS Utility Reports at the beginning of the year being reported. This choice was made to match the authorized ROEs and the long-term Treasury rates in the year being considered. CA Turner/AUS Utility Reports does not provide information about the ROE that was authorized for American Water Works in those years when it was not publicly traded. However, data for all of the other utilities in the water utilities sample were available to compute the average. In those other years, the average ROE was based on an average of available data for six of the seven water utilities.

Q. WHERE DO YOU REPORT YOUR ESTIMATES OF FORECASTED INTEREST RATES?

A. They are reported in Table 2. Averages of forecasts of long-term Treasury rates for the period 2011 to 2013 were used in my RP analyses. The cost of equity estimates made with the risk premium analyses should be for the period new rates will be in effect, not the cost of equity today, and thus forecasted interest rates should be used in the CAPM and the various RP analyses. In my opinion, a forward-looking period of three years is a reasonable future period to use in this analysis. It also reflects a time period during which Arizona Water's new rates will be in effect.

Q. WHAT IS THE RESULT OF THE FIRST RP ANALYSIS?

A. Given the current forecast of long-term Treasury rates of 5.07 percent, the cost of equity range indicated with this risk premium approach is 10.6 percent to 10.8 percent for the sample and 11.1 percent to 11.3 percent for Arizona Water.

Q. PLEASE DISCUSS YOUR SECOND RP ANALYSIS.

A. The second RP analysis adopts ten annual average DCF estimates as the proxies for the cost of equity in ten different years. I subtract the long-term average Treasury rate for the respective years to determine ten annual estimates of the average risk premiums required by water utilities in those years. I then compute five-year and ten-year averages of those risk premiums to determine the forward-looking risk premiums for the analysis.

These annual DCF estimates are averages of annual DCF estimates derived from available data for the water utilities sample.[3] See Table 17. Current dividend yields for each utility were computed as an annual average of yields for the various years. Growth rates are averages of EPS growth rates forecast by Value Line and analysts' forecasts reported in the S&P Earnings Guide until 2008, when S&P stopped publishing the Earnings Guide. If the S&P Earnings Guide was not available, forecasts reported by Zacks were used. The annual costs of equity for each utility were averaged to compute annual average costs of equity for each of the ten years in the study. This RP analysis indicates a cost of equity range of 11.0 percent to 12.2 percent for the sample and a cost of equity range for Arizona Water of 11.5 percent to 12.7 percent.

[3] Data for American Water Works were only available in 2000, 2001, 2002 and 2009.

Q. PLEASE SUMMARIZE THE CHECKS ON YOUR CAPM ESTIMATE OF 11.2 PERCENT.

A. I conducted two checks of the CAPM estimate with these two alternative risk premium approaches. The CAPM is a special case of the more general risk premium approach. Based on the two other RP approaches, the cost of equity for the water utilities sample falls in a range of 10.6 percent to 12.2 percent. The 11.2 percent ROE I estimate with the CAPM approach is close to the middle of that range and thus is corroborated by these estimates.

V. Additional Risks of Arizona Water

Q. WHY IS IT NECESSARY TO CONSIDER RISKS SPECIFIC TO ARIZONA WATER IN ADDITION TO DETERMINING THE BENCHMARK COST OF EQUITY FOR THE WATER UTILITIES SAMPLE?

A. The purpose of my analysis is to determine the cost of equity for Arizona Water, not just the benchmark cost of equity for the water utilities sample. Determining the benchmark cost of equity for the water utilities sample takes into account risks common to all water utilities, but not risks that are specific to the target utility whose equity cost we are trying to determine. To complete the cost of equity analysis, we must consider Arizona Water's company-specific risk in addition to determining the benchmark cost of equity for the water utilities sample.

Q. HOW DO YOU APPROACH EVALUATING ARIZONA WATER'S SPECIFIC RISKS?

A. It is useful to categorize risks into business risk and financial risk. Financial risk is risk that is related to the financial leverage of the utility. Business risks are those risks that are unique for the particular utility because of its structure and operating environment, and are independent of any financial risks.

Q. PLEASE ADDRESS DIFFERENCES IN FINANCIAL RISK OF ARIZONA WATER AND THE WATER UTILITIES SAMPLE. DO SMALLER UTILITIES REQUIRE HIGHER EQUITY RATIOS THAN LARGER UTILITIES?

A. Yes. In a now classic article, Scott and Martin, "Industry Influence on Financial Structure," *Financial Management*, Spring 1975, pp. 67-71, found statistically significant results for unregulated firms that show " . . .[s]maller equity ratios (higher leverage use) are generally associated with larger companies" (page 70). It is reasonable to presume these unregulated firms attempted to have low cost capital structures. In conducting their study, Scott and Martin analyzed twelve industries and found a " . . . linear relation between equity ratios and total assets within each industry". That study indicates smaller firms attempting to establish low cost capital structures will have higher equity ratios than larger firms in the same industry. Arizona Water is smaller than all of the utilities in the water utilities sample and thus would be expected to maintain an equity ratio that is larger than the equity ratios of those larger utilities.

Q. IS THERE A RELATIONSHIP BETWEEN SIZE AND APPROPRIATE EQUITY RATIOS?

A. Yes, the evidence in the Scott and Martin article indicate that, generally, larger water utilities are expected to have lower equity ratios. Data in Table 3 are consistent with this expected relationship. The equity ratios for the two largest utilities in the water utilities sample, American Water Works and Aqua America, are less than 45 percent but the average equity ratio for the remaining five water utilities is 52 percent.

Q. WHAT DO THE SCOTT AND MARTIN ARTICLE AND THE EVIDENCE IN TABLE 3 INDICATE ABOUT THE APPROPRIATE EQUITY RATIO FOR ARIZONA WATER?

A. Arizona Water is smaller than all of the utilities in the water utilities sample. Thus, this evidence indicates it would be appropriate for Arizona Water to have an equity ratio of at least 52 percent and shows that Arizona Water's equity ratio of 51 percent is reasonable.

Q. HAVE YOU INCLUDED A RISK PREMIUM FOR ARIZONA WATER BASED ON LEVERAGE?

A. No, I have not, although an argument could be made for a higher risk premium based on this factor. As a result, taking a conservative approach, the risk premium I estimate for Arizona Water considers business risk only.

Smaller Water Utilities Have More Business Risk

Q. PLEASE TURN TO YOUR CONSIDERATION OF DIFFERENCES BETWEEN BUSINESS RISKS OF ARIZONA WATER AND THE WATER UTILITIES SAMPLE. DOES ARIZONA WATER HAVE MORE BUSINESS RISK THAN THE WATER UTILITIES SAMPLE BECAUSE OF ITS SIZE?

A. Yes. Arizona Water is more risky because it is smaller than every utility in the water utilities sample. Table 3 compares customer counts, operating revenues and net plant of Arizona Water with comparable values for the water utilities sample. Based on these measures of size, Arizona Water is very much smaller (between 89 percent and 92 percent smaller) than the average utility in the water utilities sample, and is smaller than all of the seven utilities in the sample. These measures of size indicate Arizona Water is more risky and requires a higher ROE than the equity costs estimated for the water utilities sample.

Q. DO QUANTITATIVE STUDIES SHOW THAT SIZE HAS AN IMPACT ON RISK?

A. Yes. Quantitative studies show that smaller companies in general, and smaller water utilities in particular, have higher costs of equity. The original CAPM, developed in the mid-1960s, relied upon beta as the only measure of risk. Eugene Fama and Kenneth French conducted empirical studies that showed beta risk tends to be higher for small companies, but even after recognizing differences in beta risk, smaller companies are generally more risky than larger ones.[4] In effect, Fama and French found company size and distress must be considered in addition to beta risk in order to achieve a complete determination of risk and the required return on equity.

Q. HAVE OTHER EXPERTS ON THIS TOPIC STUDIED THIS ISSUE?

A. Yes. Morningstar (formerly Ibbotson Associates) studied the issue of firm size and risk over a number of years and found that beta risk is typically higher for smaller companies than for larger companies. Also, independent of differences in beta risk, Morningstar found that smaller companies require higher returns than would be predicted by the original version of the CAPM.[5] Data from the Morningstar, 2010 *Ibbotson SBBI Valuation Yearbook* are reported in Table 6. Footnotes in Table 6 show the threshold sizes of companies in the Micro-Cap, Low-Cap and Mid-Cap categories in the study reported by Morningstar in *Ibbotson SBBI 2010 Valuation Yearbook.* Table 3 reports market valuations of the water utilities sample comparable to the market capitalization values reported in the footnotes in Table 6. Three of the utilities in the water utilities sample are in the Micro-Cap category, two are in the Low-Cap category and two are in the Mid-Cap category. Table 6 shows that, based on the Ibbotson 2010 study, even without accounting for differences in beta risk, companies the size of the three smallest utilities in the water utilities sample require expected returns that are 136 basis points higher than companies in the Low-Cap category and an even higher risk premium than Aqua America and American Water Works, which are in the Mid-Cap category. The Morningstar/Ibbotson studies also found that there is no "bright line" between large and small enterprises but that enterprises require increasingly higher returns as

[4] "Industry Costs of Equity," Journal of Financial Economics 43 (1997), pp. 153-193, and "The Capital Asset Pricing Model: Theory and Evidence," *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004, pp. 25-46.

[5] See Table 7-11 in Morningstar, *Ibbotson SBBI 2009 Valuation Yearbook*.

size decreases. Based on customer counts, operating revenues and net plant, Arizona Water is much smaller than the three smallest utilities in the water utilities sample. All other factors being equal, this study indicates a company the size of Arizona Water requires a risk premium of no less than 136 basis points.

Q. PLEASE TURN TO SPECIFIC STUDIES FOR WATER UTILITIES. HAS THE CALIFORNIA PUC ANALYZED DIFFERENCES IN RISK BETWEEN SMALLER AND LARGER WATER UTILITIES?

A. Yes, Staff of the California PUC analyzed differences in risk between larger and smaller water utilities. The CPUC Staff estimated proxies for beta risk with accounting data for 58 small water utilities that were not publicly traded, and found that smaller water utilities (Class C and Class D) required equity returns higher than the larger Class A water utilities, even though most of those smaller water utilities were financed with 100 percent equity. The study found that business risk increased as the size of water utilities decreased. This increase in business risk more than offsets the lower financial risk that accompanies higher equity ratios.[6] The California PUC makes annual determinations of costs of equity for the smaller water utilities - most recently in March 2010 - and the California PUC continually finds smaller water utilities (Class B, Class C and Class D) require higher returns on equity than larger Class A water utilities. .

Q. HAVE YOU PUBLISHED ANY STUDIES ON HOW THE SIZE OF UTILITIES AFFECTS RISK?

A. Yes. Exhibit TMZ-3 is my article, "Utility Stocks and the Size Effect - Revisited," *The Quarterly Review of Economics and Finance*, Vol. 43, Issue 3, Autumn 2003, pp. 578-582, which addresses this issue. The results of my study are included in Panel 2 of Table 6.

[6] California PUC Staff, Staff Report on Issues Related to Small Water Utilities, June 10, 1991 and CPUC Decision 92-03-093.

Market information is required to estimate costs of equity. It is difficult to find useful market information for small water utilities because many of the small utilities, such as Arizona Water, are not publicly traded. Market data required to make DCF cost of equity estimates for four water utilities in California, however, were available to conduct such an analysis for the period 1987 to 1997. My study determined DCF costs of equity for those enterprises with methods used by the California PUC Staff and then compared average costs of equity of the two smaller water utilities, Dominguez Water Company and SJW Corporation (San Jose Water), with costs of equity for the two larger companies, California Water Service and American States Water. The table at page 4 of Exhibit TMZ-3 reports that the smaller water utilities had a cost of equity that, on average, was 99 basis points higher than the average cost of equity for the larger water utilities. The t-statistic reported in that table shows that the cost of equity for the smaller water utilities is statistically significantly higher than the cost of equity for the larger water utilities.

This market information provides another indication of the risk premium required by Arizona Water. Table 3 shows Arizona Water is smaller than all of the utilities in the water utilities sample and thus Arizona Water has a higher cost of equity. An appropriate risk premium for Arizona Water will incorporate a risk premium commensurate with its smaller size.

Q. ARE YOU AWARE OF A REGULATORY COMMISSION THAT RECENTLY FOUND IT REASONABLE TO PROVIDE A RISK PREMIUM ADJUSTMENT FOR SIZE?

A. Yes. In Golden Heart/College Utilities Order U-07-76(8)/U-07-77(8), dated June 30, 2008, at page 70, the Regulatory Commission of Alaska found that differences between the risks of the larger water utilities used to determine benchmark costs of equity and the risks of the smaller Alaska water utilities at issue in that case justified a size premium of 100 basis points. Alaska Power Company is another small utility. In the September 29, 2010 order for Alaska Power Company, Docket U-09-90, Order No. 8, at page 13, the Regulatory Commission of Alaska stated "Considering all of the testimony on the cost of equity for the proxy groups and the special risk factors faced by APC, we find that a return on equity of 12.8 percent most reasonably represents APC's cost of equity." The small size of APC was one of the special risk factors.

<u>**Application of California PUC DRA Staff's Risk Analyses**</u>

Q. IS THERE OTHER EVIDENCE THAT SHOWS ARIZONA WATER REQUIRES A RISK PREMIUM?

A. Yes. Dr. J. Randall Woolridge filed testimony on behalf of the Division of Ratepayer Advocates ("DRA") of the California PUC in Application 09-05-001. (Exhibit DRA-1, dated July 10, 2009.) As part of that testimony, DRA presented a study designed to estimate company-specific risk premiums for five Class A water utilities that were parties to a generic ROE proceeding conducted in 2009. When the California DRA Staff analysis is applied to data for Arizona Water, the indicated required risk premium for Arizona Water falls in a range of 32 to 61 basis points. A Class A water utility in California is defined to be one having over 10,000 service connections.

Q. PLEASE EXPLAIN THE CALIFORNIA DRA STAFF ANALYSIS.

A. The California DRA analysis was based on two tests which were used to assess the relative risk of five California Class A water utilities. Those risk assessments were discussed at pages 56-58 of Exhibit DRA-1 and the results of the analyses were presented in Attachment JRW-13 in that case. (Attached hereto as Exhibit TMZ-4.) DRA's two tests provide quantitative estimates of relative risk and are applicable to water utilities which are both publicly-traded and those that are not. Thus, these tests can be used to provide estimates of the relative risk of Arizona Water and provide another indicator of the risk premium required by the Company.

Q. WHAT IS THE FIRST TEST USED BY THE DRA IN ITS ASSESSMENT OF RISK IN THAT CASE?

A. The first test compares earned versus authorized ROEs for five year periods for utilities in two samples. One sample is composed of the five California Class A water utilities which were parties in Application 09-05-001. The other sample is the water utilities sample used to determine benchmark cost of equity estimates in this case for which there are data available to make the tests. In this first test, under-earning an authorized ROE is an indication of higher risk.

Q. WHAT IS THE SECOND TEST USED BY THE DRA IN ITS ASSESSMENT OF RISK IN THAT CASE?

A. The second test compares Coefficients of Variation ("CV") of earned ROEs during five year periods. The CV, computed as the standard deviation of earned ROEs divided by the mean ROE, is a standardized measure of volatility and thus is a measure of relative risk. In this test, a higher CV indicates higher risk.

Q. PLEASE DISCUSS THE RESULTS OF YOUR FIRST TEST OF THE RELATIVE RISK OF ARIZONA WATER COMPARED TO THE TWO SAMPLES OF WATER UTILITIES.

A. For both tests, I used five years of data, as did the DRA Staff. The data for the California water utilities were limited to available data for 2004-2008, which were provided to DRA in response to data requests. Data for 2009 were not available. Data for the water utilities sample and Arizona Water are based on the most recent five-year period of 2005-2009. The updated 2009 data were obtained from AUS Utility Reports, 10-K Reports to the SEC and from Arizona Water.

For the first test, when I compared earned versus authorized ROEs, the results for the California sample were significantly affected by very high earned ROEs for Suburban Water. Thus, to avoid overstating the relative risk of Arizona Water, I did not include Suburban Water in the averages reported in the analysis.

During the five year period of the California study conducted by DRA Staff, on average, the remaining four California Class A water utilities under-earned their authorized ROEs, with an average level of underperformance of -0.45 percent. By comparison, the average underperformance for Arizona Water was -3.04 percent during the last five years. Based on this measure of relative risk, an investment in Arizona Water is 6.8 times more risky than an investment in the four California water utilities. See Table 18.

Consideration of the water utilities sample during the most recent five-year period showed that an investment in Arizona Water is also more risky than the sample used to determine benchmark cost of equity estimates. On average, the water utilities sample underperformed by -0.92 percent. The range of over (under) performance ranks for companies in this sample ranged from an under-performance -2.34 percent for Connecticut Water Service to an over-performance of +0.96 percent for SJW Corp. Thus, based on this first test, Arizona Water was at least 3.3 times more risky than the average utility in the water utilities sample. See Table 19.

Q. PLEASE TURN TO THE RESULTS FOR THE SECOND RELATIVE RISK TEST.

A. In the second relative risk test, the average CV for the California Class A water utilities was 0.20, and the average CV for the utilities in the water utilities sample was 0.22. By comparison, the average CV for Arizona Water was 0.38. This CV test also indicates the relative risk of investing in Arizona Water is greater than the relative risks of investing in any of the utilities in the sample of California Class A water utilities, and is much greater than the average risk for either sample. Based on the CV test, Arizona Water is 70 percent more risky than the average utility in the water utilities sample, at least 90 percent more risky than the average utility in the sample of California Class A water utilities, and 30 percent more risky than the highest risk water utility (Valencia Water) in the California Class A water utilities sample.

Q. CAN THESE ANALYSES BE USED TO PROVIDE ANOTHER ESTIMATE OF THE RISK PREMIUM REQUIRED BY ARIZONA WATER?

A. Yes, according to California DRA Staff, the results of these analyses support a risk premium of 25 basis points for Valencia Water, the most risky Class A water utility in the California generic ROE case. Valencia Water had an under-performance of -1.25 percent and CV of 0.30, which indicated it was more risky than the other California Class A water utilities. (See testimony filed in Exhibit DRA-1, California Application 09-05-001, page 57 and Attachment JRW-13, page 5, attached to this testimony as Exhibit___TMZ-4). DRA Staff concluded that based on these relative risk analyses, Valencia Water should be authorized a risk premium of 25 basis points.

Q. BASED ON THESE MEASURES OF RELATIVE RISK, DOES ARIZONA WATER REQUIRE A RISK PREMIUM LARGER THAN 25 BASIS POINTS?

A. Yes. Relying on these same tests, Arizona Water is a more risky investment. When compared to the 25 basis point risk premium recommended for Valencia Water, these analyses indicate Arizona Water should be authorized a risk premium in the range of 32 basis points (25 basis points times the ratio of the CV for Arizona Water of .38 divided by a CV of .30 for Valencia Water) and 61 basis points (25 basis points times a ratio of the underperformance of Arizona Water of -3.04 percent divided by the underperformance of Valencia Water of -1.25 percent).

<u>Recommended Risk Premium</u>

Q. WHAT IS YOUR RECOMMENDED RISK PREMIUM FOR ARIZONA WATER?

A. I recommend a risk premium of 50 basis points. This recommended risk premium takes into account the fact that Arizona Water is smaller than all of the utilities in the water utilities sample. It is a conservative estimate of the required risk premium given risk premium estimates in the range of 99 to 136 basis points indicated by the results of the Morningstar study, the study of water utility risk premiums conducted by the California PUC and my study for water utilities (Exhibit TMZ-3). It is also supported by the fact that Arizona Water has a reduced opportunity to earn its cost of equity because its future rates are determined using historic test years with limited out-of-period adjustments compared to other water utilities with rates and rate-adjustment mechanisms that give them better opportunities to recover their costs of equity. The 50 basis point risk premium I recommend is corroborated by application of the relative risk analysis conducted by Staff of the DRA in California to data for Arizona Water, which indicates the appropriate risk premium for the Company falls in a range of 32 to 61 basis points.

VI. Summary and Conclusions

Q. PLEASE SUMMARIZE YOUR RECOMMENDATION.

A. I recommend the Commission adopt the three-step method I presented above to determine the ROE for Arizona Water. In the first step, an average of costs of equity for the seven utilities in the water utilities sample is determined with the DCF model and the CAPM with checks made with two other RP models. I have concerns with the CAPM estimates at this time of market volatility, but adopt the ACC Staff method of estimating the cost of equity by giving both the CAPM and the DCF estimates the same weight.

In the second step, a risk premium for Arizona Water is determined to reflect the Company's higher business risks. Based on considerations of size, limitations placed on test year expenses and rate base used to determine revenue requirements and a relative risk analysis, I recommend a company-specific risk premium of 50 basis points be adopted for the Company.

In the third step, costs of equity from step one and the risk premiums from step two are combined to determine a fair ROE range for Arizona Water of 11.4

percent to 12.8 percent. I recommend the Commission adopt an ROE for Arizona Water of 12.1 percent, the average of that cost of equity range.

Q. GIVEN THE RESULTS OF YOUR COST OF EQUITY ANALYSES, IS AN ROE OF 12.1 PERCENT FOR ARIZONA WATER FAIR AND REASONABLE, BOTH TO THE UTILITY AND ITS RATEPAYERS?

A. Yes. A 12.1 percent ROE is the average of the top and bottom of the range and thus is a reasonable ROE for Arizona Water.

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes.

TMZ-1

THOMAS M. ZEPP

Vice President
Utility Resources, Inc.

EDUCATION

University of Florida	Ph.D. Economics M.A. Economics
Wofford College	A.B. Economics (Magna Cum Laude, Phi Beta Kappa)

SELECTED CONSULTING EXPERIENCE

- Finance

Sponsored testimony on the cost of capital faced by electric utilities in court cases and before regulatory commissions in Alaska, Arizona, Idaho, Illinois, Nevada, Oregon, and Washington.

Sponsored testimony on the cost of capital faced by natural gas utilities before regulatory commissions in Illinois, Oregon, Washington and Wyoming.

Sponsored testimony on the cost of capital faced by water utilities before regulatory commissions in Alaska, Arizona, California, Hawaii, Kentucky, Montana, New Mexico, Oregon, and Tennessee.

Estimated costs of capital for Bell Operating Companies and General Telephone local companies in Illinois, Nevada, Oregon and Washington.

Presented estimates of cost of capital of U. S. railroads to the Interstate Commerce Commission.

Estimated cost of capital for a large insurance company.

Presented testimony on the cost of capital of hospitals on behalf of Washington State Hospital Commission.

- Court Proceedings

Expert witness in PPL Montana, Avista Corporation and Pacific Corp vs State of Montana. Testified on behalf of Avista Corporation and was deposed on July 23, 2007.

Expert witness in Umatilla County, Oregon, Circuit Court on the harms to PacifiCorp and benefits to the City of Hermiston of a condemnation of property in the City of Hermiston.

Expert witness in Linn County, Oregon, Circuit Court regarding the harms to an electric utility compared to the benefits of two mills and a People's Utility District of an annexation resulting in a condemnation of electric facilities.

Expert witness in Superior Court of California regarding the value of water company facilities that were made inoperative or otherwise reduced in value after a sanitation district duplicated those facilities.

Expert witness in an Oregon District Court on the present value of economic benefits/harms of transferring hydroelectric plants from Pacific Power & Light Company to a PUD in Oregon.

Rebuttal witness for the Illinois Attorney General in a court appeal on the cost of capital and need for a stay in rates for an electric utility.

Estimated the present value of severance damages resulting from condemnation of a distribution system in California.

Determined the value of facilities to be taken by a City from Strawberry Electric Service District in Utah.

Witness in an Oregon District Court on rates that would have been charged by electric utilities if markets had been more competitive.

Presented an affidavit in Federal Court in Georgia on the cost of service of a municipal water utility.

- Other Studies and Testimonies

Testified on economic principles of regulation before the West Virginia PSC.

Sponsored expert testimony on potential export revenues for BC Hydro to the British Columbia Utility Commission based upon analysis of Canadian and Pacific Northwest hydroelectric records.

Analyzed the costs and benefits of improved efficiency of a BPA system dam based upon the Northwest System Analysis Model and export prices on behalf of Hitachi America.

Presented testimony on the appropriate cost of service methodology to be used to determine electric rates to the Public Utilities Board of the Great Northwest Territories, Canada.

Estimated avoided costs for two Pacific Northwest electric utilities on behalf of the City of Portland, Oregon and Northwest Natural Gas Company.

- Telecommunications and Cable

Prepared a Declaration on appropriate fees for the use of rights of way in Portland, Oregon on behalf of Electric Lightwave, Inc.

Testified on behalf of New Edge and Advanced TelCom Group, Inc. regarding Nevada Bell's proposed nonrecurring charges to be assessed to CLECs for certain loop conditioning activities.

Prepared cost estimates and testified on economic principles and costs of paging on behalf of AirTouch Paging in Colorado and Washington.

Testified on economic principles and costs of wireless service on behalf of AT&T Wireless Services in arbitrations with U S WEST in Colorado, Minnesota, Oregon, and Washington.

Testified on economic principles on behalf of AT&T in arbitrations with GTE in Oklahoma and Oregon.

Testified on behalf of Frontier Telemanagement regarding U S WEST's proposal to withdraw Centrex service after the 1996 Federal Act was passed.

Testified on economic principles and an analysis of U S WEST cost studies on behalf of AT&T Communications and MCI Metro in arbitrations and permanent cost dockets in nine states.

Prepared analyses of local costs of telecommunication service and presented testimony on appropriate rates in Idaho, Nevada, Oregon and Washington.

Sponsored testimony in support of resale of local telecommunications services in California, Iowa, Minnesota, Oregon and Washington.

Presented testimony on the benefits of intraLATA competition in Nebraska.

Presented analyses of private line costs and appropriate rates in Colorado, Idaho, Oregon and Washington.

Estimated costs of local telephone service for a study commissioned by the Oregon legislature.

Reviewed cost studies and negotiated Enhanced 9-1-1 rates with Washington telecommunications companies on behalf of the State of Washington.

Prepared econometric estimates of telephone usage costs and sponsored testimony on appropriate cost-based usage rates.

Sponsored testimony on the appropriate costs and prices for pole attachments in Washington.

PREVIOUS POSITIONS

Zinder Companies, Inc.	Senior Consultant
Oregon Public Utility Commissioner	Senior Economist
Central Michigan University	Assistant Professor of Econometrics
Armstrong State College and Savannah State College, the Joint Graduate Program	Assistant Professor of Business and Economics
University of Florida	Instructor

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Published papers in Water, Financial Management, The Quarterly Review of Economics and Finance and Explorations in Economic History.

Read papers at the Southern Economic Association meetings.

Invited lecturer at Stanford University seminar.

Invited Speaker at the 2002 Pacific NW Regional Economic Conference and at the 57th Annual Western Conference of Public Service Commissioners

Journal Referee for Financial Management and International Review of Economics and Finance

Past Member, NARUC Subcommittee on Economics

TMZ-2

TABLES

Arizona Water Company

Table 1

Past and Current Spreads Between Treasury Rates and Rates for Baa Bonds

A. Past Actual Rates (1990 to 2007)–[a/]

Year	30-Year Treasury Rates	Baa Rates	Spread
1990	8.61%	10.36%	1.75%
1991	8.14%	9.80%	1.66%
1992	7.67%	8.98%	1.31%
1993	6.59%	7.93%	1.34%
1994	7.37%	8.63%	1.26%
1995	6.88%	8.20%	1.32%
1996	6.71%	8.05%	1.34%
1997	6.61%	7.87%	1.26%
1998	5.58%	7.22%	1.64%
1999	5.87%	7.88%	2.01%
2000	5.94%	8.37%	2.43%
2001	5.49%	7.95%	2.46%
2002	5.42%	7.80%	2.38%
2003	5.05%	6.76%	1.71%
2004	5.12%	6.39%	1.27%
2005	4.56%	6.06%	1.50%
2006	4.91%	6.48%	1.57%
2007	4.84%	6.48%	1.64%
Average (1990-2007)	6.19%	7.85%	1.66%
2008	4.28%	7.44%	3.16%
2009	4.08%	7.29%	3.21%

Expected spread in 2010–[b/]	1.80%
Expected average spread for 2011-2013–[c/]	1.83%

Notes and Sources:

a/ Source is Federal Reserve or as implied by rates for 20-year Treasury bonds when 30-year bonds are not available.

b/ Expected spread derived from October 2010 Blue Chip consensus forecasts of 5.6% for Baa bonds and 3.8% for 30-year Treasury securities for fourth quarter 2010.

c/ From data in Table 2.

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Arizona Water Company

Table 2

Forecasts of Baa Rates and Long-term Treasury Securities Rates
2011 - 2013

	2011	2012	2013	Average
Long-term Treasury Rates				
Blue Chip Consensus Forecasts-[a/]	4.50%	5.30%	5.70%	
Value Line-[b/]	4.40%	5.00%	5.30%	
Average				5.03%
Seasoned Baa Corporate Bonds				
Blue Chip Consensus Forecasts-[a/]	6.10%	7.00%	7.50%	
Value Line-[b/]	na	na	na	
Average				6.87%

Sources and Notes:

a/ Blue Chip long-term long-term consensus forecasts for 2012 and 2013 dated June 2010 and for Fourth Quarter 2011, dated October 2010.

b/ Value Line Quarterly forecasts dated August 27, 2010.

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Arizona Water Company

Table 3

Selected Characteristics of the Water Utilities Sample

					Measures of Firm Size			
	Companies in Sample	S&P Bond Rating-[a/]	Common Equity Ratio-[c/]	Percentage Revenue from Regulated Operations-[a/]	Number of Customers (000)-[b/]	Operating Revenues-[a/] ($ millions)	Net Plant-[a,b/] ($ millions)	Market Capitalization-[a/] ($ millions)
1	American States Water	A	54%	81%	278	$374	$939	$614
2	American Water Works Co., Inc.	A+	43%	90%	3331	$2,537	$9,551	$3,932
3	Aqua America	AA-	44%	96%	953	$688	$2,890	$2,658
4	California Water Service	AA-	53%	98%	495	$455	$1,121	$725
5	Connecticut Water Service	A	49%	90%	89	$69	$281	$185
6	Middlesex Water	A	53%	84%	96	$96	$342	$234
7	SJW Corporation	NR	51%	96%	235	$212	$548	$428
	Average	A	50%	91%	782	$633	$2,239	$1,254
	Average for 5 Smallest	A	52%	90%	238	$241	$646	$437
	Arizona Water-[d/]	--	51%	100%	84	$51	$256	--

Notes and Sources:
_a/ Source: AUS Utility Reports, October 2010 and 2009 10K reports.
_b/ Most recent (2009) 10-K Reports or Annual Reports for the various utilties.
_c/ From Value Line reports dated October 22, 2010.
_d Company data as of year-end 2009.

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Arizona Water Company

Table 4

Betas of Utilities in the Water Utilities Sample
2002 and 2010

		Value Line Beta Estimates[a]		
		August 2002	October 2010	Percent Increase
1	American States Water	0.65	0.80	23%
2	American Water Works Co	[b]	0.65	na
3	Aqua America	0.60	0.65	8%
4	California Water Service	0.60	0.75	25%
5	Connecticut Water Service	0.45	0.80	78%
6	Middlesex Water	0.45	0.75	67%
7	SJW Corporation	0.55	0.95	73%
	Average	0.55	0.76	46%

Notes and Sources:

a/ From Value Line editions dated August 2, 2002 and October 22, 2010.

b/ In the process of being acquired. Not a market measure of beta risk.

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Arizona Water Company

Table 5

Past Growth Rates for Utilities in the Water Utilities Sample
Average Changes for the Fifteen Year Period Ending in 2009

		Price-[a]	BVPS-[b]	DPS-[b,c]	EPS-[b]	Average-[c]
1	American States Water	8.3%	4.5%	1.6%	6.3%	6.3%
2	American Water Works Co.,	na	na	na	na	na
3	Aqua America	16.3%	8.5%	7.0%	7.6%	10.8%
4	California Water Service	7.1%	3.9%	1.2%	4.6%	5.2%
5	Connecticut Water Service	7.3%	4.0%	1.4%	4.9%	5.4%
6	Middlesex Water	6.2%	4.3%	2.1%	1.8%	4.1%
7	SJW Corporation	14.4%	6.6%	4.3%	8.4%	9.8%
	Sample Average	9.9%	5.3%	2.9%	5.6%	6.9%

Notes and Sources:

a/ Average of changes in year-end prices ending in 2009.

b/ Derived from data in Annual Reports to Stockholders and 10-K Reports for period 1994-2009.

c/ DPS growth not included in averages. Support for exclusion of DPS growth is the logic stated by the California PUC in Decision 06-08-011.

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Arizona Water Company

Table 6

Evidence Showing Risk Increases as the Size of Companies Decrease

	Beta Risk	Size Risk Premium	Risk Premium for Companies the Size of Small Water Utilities[e]
1. <u>Evidence from Morningstar</u>[a]			
Mid-Cap Companies[b]	1.13	1.00%	
Low-Cap Companies[c]	1.26	1.64%	
Micro-Cap Companies[d]	1.51	3.00%	1.36%

2. <u>Evidence Published in Zepp Article</u>[f]

	Risk Premium for Small Water Utilities
Estimated risk premium for small water utilities	0.99%

<u>Notes and Sources:</u>

a/ Data from Table 7-11 of Morningstar 2010 SBBI Valuation Edition Yearbook.

b/ Companies with market capitalization between $1,600 million and $5,936 million included in the Morningstar 2010 study.

c/ Companies with market capitalization between $431 million and $1,600 million. included in the Morningstar 2010 study.

d/ Companies with market capitalization less than $431 million included in study.

e/ Computed as the difference between 3.00% and 1.64%. Does not reflect differences in risk due to differences in betas. Data provided in Table 7-10 of the same study, but based on betas estimated with a different method, indicate a size risk premium of 1.45%.

f/ From Table 2 in T.M. Zepp, "Utility Stocks and the Size Effect--Revisited," *The Quarterly Review of Economics and Finance*, 43 (2003), 578-582.

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Arizona Water Company

Table 7

Current Annualized Average Dividend Yields of Utilities in the Water Utilities Sample

		3-Month Average D_0/P_0 (a)	6-Month Average D_0/P_0 (b)
1	American States Water	3.15%	3.10%
2	American Water Works Co., Inc	4.03%	4.26%
3	Aqua America	2.99%	3.22%
4	California Water Service	3.45%	3.40%
5	Connecticut Water Service	4.19%	4.30%
6	Middlesex Water	4.43%	4.54%
7	SJW Corporation	2.99%	2.84%
	Average	3.60%	3.67%

Source:
_a/ For periods ending October 31, 2010.

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Arizona Water Company

Table 8

Comparison of Analysts' Forecasts of Future Growth
With Estimates of Growth Based on Past Growth in
DPS, EPS and Retained Earnings Made by California PUC Staff[a/]

				CPUC Staff Estimates of Growth Based on Past Data		Average of Analysts'	Are Forecasts Comparable
		Application Number	Date	Retained Earnings	DPS and EPS Growth	Forecasts of Growth	to Past Growth?
	Period: 1992 to 1998						
1	Valencia Water Company	A.92-01-022	June 1992	3.6%	5.9%	3.9%	yes
2	Dominguez Water Corp	A.92-03-040	June 1992	3.6%	5.9%	4.1%	yes
3	California-American Water	A.92-03-030	July 1992	3.6%	5.9%	4.1%	yes
4	San Gabriel Valley Water	A.92-09-032	April 1993	3.5%	6.0%	4.5%	yes
5	Park Water Company	A.94-03-038	June 1994	2.7%	4.5%	4.2%	yes
6	Valencia Water Company	A.94-04-033	Aug 1994	3.3%	4.5%	4.2%	yes
7	Southern Calif Water	A.95-03-013	July 1995	2.7%	4.6%	3.3%	yes
8	San Gabriel Valley Water	A.95-09-010	Dec 1995	3.6%	4.6%	4.0%	yes
9	California -American Water	A.95-02-016	May 1995	3.0%	4.6%	3.8%	yes
10	California -American Water	A.96-03-008	June 1996	2.8%	3.8%	3.6%	yes
11	Park Water Company	A.97-03-032	August 1997	2.9%	4.5%	3.4%	yes
12	Southern Calif Water	A.98-03-029	July 1998	2.7%	4.6%	3.6%	yes
	Period: 2000 to 2007						
1	Park Water	A.00-03-022	July 2000	2.5%	4.8%	5.2%	no
2	California Water Servioce	A.01-09-062	March 2002	3.1%	4.2%	6.3%	no
3	Park Water	A.02-03-046	July 2002	3.3%	2.9%	5.4%	no
4	Valencia Water Company	A.02-05-013	Sept 2002	3.4%	2.9%	6.5%	no
5	California-American Water	A.02-09-030	March 2003	3.1%	2.4%	6.2%	no
6	Southern Calif Water	A.02-11-007	April 2003	3.1%	2.4%	5.6%	no
7	San Gabriel Valley Water	A.02-11-044	July 2003	3.0%	3.3%	6.2%	no
8	San Jose Water	A-03-05-035	November 2003	3.0%	3.3%	6.1%	no
9	California -American Water	A.03-07-036	January 2004	2.9%	3.4%	6.3%	no
10	California -American Water	A.04-03-023	July 2004	2.9%	2.8%	6.7%	no
11	California-American Water	A.04-04-040	November 2004	2.8%	2.9%	7.0%	no
12	Suburban Water System	A.05-08-034	November 2005	2.8%	4.2%	8.3%	no
13	San Jose Water	A.06-02-014	June 2006	2.4%	3.7%	7.9%	no
14	Golden State Water	A.07-01-009	May 2007	3.1%	5.0%	8.9%	no

Notes and Sources:

a/ All growth rates are growth rates based on data reported in Califronia PUC Staff Cost of Capital Reports.

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Table 9

Analysts' Forecasts of Growth for DCF Model

		Zack's[a/]	Yahoo! Finance[a/]	Reuters[a/]	Value Line[b/]	Average
1	American States Water	7.5%	6.3%	6.3%	8.0%	7.0%
2	American Water Works Co., Inc.	8.9%	10.5%	10.9%	7.0%	9.3%
3	Aqua America	6.0%	6.7%	7.3%	11.0%	7.7%
4	California Water Service	4.0%	8.7%	8.7%	6.0%	6.9%
5	Connecticut Water Service	_c/	15.0%	8.0%	_c/	11.5%
6	Middlesex Water	_c/	8.0%	nmf	_c/	8.0%
7	SJW Corporation	_c/	14.0%	nmf	_c/	14.0%
	Simple Average					9.2%
	Weighted Average					8.4%

Sources and Notes:

a/ Reported on the Internet, November 3, 2010.

b/ Reported by Value Line October 22, 2010. Forecast for American Water Works is derived from Value Line's forecast of EPS for 2014.

c/ Analysts' consenus forecasts are not available at this time.

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Arizona Water Company

Table 10

DCF Estimates Based on Data for the Water Utilites Sample and Conceptually Correct Growth Rate Estimates

3-Month Average Current Yield [a]		3.60%	[a]
Growth Rate		8.43%	[b]
Expected Yield		3.91%	[c]
ROE		12.3%	[d]

6-Month Average Current Yield [a]		3.67%	[a]
Growth Rate		8.43%	[b]
Expected Yield		3.98%	[c]
ROE		12.4%	[d]

Benchmark Range of ROE Estimates for the Water Utilities Sample	12.3%	to	12.4%

Notes and Sources:

a/ The 3-month and 6-month yields reported in Table 7.
time value of money.

b/ Reported in Table 9. To be conservative, the smaller of the simple average or the weighted average.

c/ Expected yield = $D_1/P_0 = D_0/P_0 * (1 + g)$.

d/ ROE = $D_1/P_0 + g$

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Table 11

DCF Estimates Based on Data for the Water Utilites Sample
Conservative Estimates of Growth Rates-[e]

3-Month Average Current Yield-[a]		3.60%	-[a]	
Growth Rate-[b]		7.69%	-[b]	
Expected Yield		3.88%	-[c]	
ROE		11.6%	-[d]	
12-Month Average Current Yield-[a]		3.67%	-[a]	
Growth Rate-[b]		7.69%	-[b]	
Expected Yield		3.95%	-[c]	
ROE		11.6%	-[d]	
Benchmark Range of ROE Estimates for the Water Utilities Sample	11.6%	to		11.6%

Notes and Sources:

a/ The 3-month and 6-month yields reported in Table 7.

b/ Average of past growth from Table 5 and weighted-forecast of growth from Table 9.

c/ Expected yield = $D_1/P_0 = D_0/P_0 * (1 + g)$.

d/ ROE = $D_1/P_0 + g$

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Table 12

Cost of Equity for Water Utilities Sample Based on the Traditional Capital Asset Pricing Model and Long-Horizon Market Risk Premium

Risk Free Rate-[a/]	5.03%
Beta-[b/]	0.76
Market Risk Premium-[c/]	6.7%
Cost of Equity for the Water Utilities Sample	10.2%
Indicated Cost of Equity for Arizona Water	10.7%

Sources and Notes:
a/ Source is Table 2.
b/ Source is Table 4.
c/ Morningstar estimate of MRP reported in Table 5-2 of Ibbotson SBBI 2010 Valuation Yearbook.

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Table 13

Cost of Equity for Water Utilities Sample
Based on the Traditional Capital Asset Pricing Model
and Recent Market Risk Premium

Risk Free Rate-[a/]	5.03%
Beta-[b/]	0.76
Market Risk Premium-[c/]	9.4%
Cost of Equity for the Water Utilities Sample	12.2%
Indicated Cost of Equity for Arizona Water	12.7%

Sources and Notes:
a/ Source is Table 2.
b/ Source is Table 4.
c/ Source is the 5-year average developed in Table 15.

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Table 14

ACC Staff Method: Implied Market Risk Premium
Derived from Value Line Forecasts
Presented in Weekly Summary & Index Report

Estimated Appreciation Potential for 1700 Stocks During the Next 3 to 5 Years–[a/]	60%
Indicated Annual Appreciation	12.5%
Expected Dividend Yield–[a/]	2.1%
Expected Return for 1700 Stocks $E(R_M)$	14.6%
Expected RF–[b/]	5.1%
Estimate of MRP $[E(R_M) - RF]$	9.5%

Notes and Sources:

a/ From Value Line Summary and Index, cover page dated October 29, 2010.

b/ From Table 2.

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Table 15

Determination of Average Risk Premiums Based on DCF Analyses of the Value Line Industrial Composite: 1984 to 2010

	Study Date	Dividend Yield	Average of Forecasted EPS and BR Growth	DCF Equity Cost	Long-term Treasury Lag 1 Mnth	Risk Premium
1	1/84	4.00%	9.32%	13.32%	11.88%	1.44%
2	1/85	3.80%	12.06%	15.86%	11.52%	4.34%
3	1/86	3.80%	10.11%	13.91%	9.54%	4.37%
4	2/87	3.00%	9.48%	12.48%	7.39%	5.09%
5	2/88	3.10%	11.25%	14.35%	8.83%	5.52%
6	7/88	3.50%	8.26%	11.76%	9.00%	2.76%
7	2/89	3.50%	10.01%	13.51%	8.93%	4.58%
8	2/90	3.20%	7.88%	11.08%	8.26%	2.82%
9	1/91	3.70%	9.08%	12.78%	8.24%	4.54%
10	2/92	2.80%	10.06%	12.86%	7.58%	5.28%
11	2/93	2.90%	7.69%	10.59%	7.34%	3.25%
12	2/94	3.00%	10.87%	13.87%	6.39%	7.48%
13	2/95	2.70%	11.25%	13.95%	7.97%	5.98%
14	3/96	2.70%	12.49%	15.19%	6.03%	9.16%
15	2/97	2.40%	11.96%	14.36%	6.91%	7.45%
16	1/98	1.50%	12.95%	14.45%	6.07%	8.38%
17	1/99	1.30%	13.81%	15.11%	5.36%	9.75%
18	2/00	0.80%	12.58%	13.38%	6.86%	6.52%
19	7/00	1.00%	12.49%	13.49%	6.28%	7.21%
20	2/01	1.20%	10.76%	11.96%	5.65%	6.31%
21	7/01	1.20%	10.07%	11.27%	5.82%	5.45%
22	1/02	1.20%	8.96%	10.16%	5.76%	4.40%
23	8/02	1.60%	7.85%	9.45%	5.51%	3.94%
24	1/03	1.60%	7.41%	9.01%	5.01%	4.00%
25	7/03	1.50%	9.92%	11.42%	4.34%	7.08%
26	3/04	1.60%	9.27%	10.87%	4.94%	5.93%
27	10/04	1.80%	9.57%	11.37%	4.89%	6.48%
28	4/05	1.90%	8.95%	10.85%	4.89%	5.96%
29	11/05	2.10%	11.03%	13.13%	4.74%	8.39%
30	5/06	2.10%	9.28%	11.38%	5.22%	6.16%
31	11/06	2.20%	12.03%	14.23%	4.94%	9.29%
32	5/07	2.50%	11.13%	13.63%	4.87%	8.76%
33	11/07	1.60%	11.93%	13.53%	4.77%	8.76%
34	5/08	1.80%	14.08%	15.88%	4.44%	11.44%
35	11/08	2.80%	11.89%	14.69%	4.17%	10.52%
36	5/09	2.80%	12.70%	15.50%	3.76%	11.74%
37	11/09	2.40%	11.22%	13.62%	4.19%	9.43%
38	8/10	2.00%	10.24%	12.24%	3.99%	8.25%

Averages for:	
All years (1987-2010)	6.5%
Last 5 years (2006-2010)	9.4%

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Table 16

Check on CAPM: Risk Premium Analysis Using Authorized Returns on Equity As Surrogates for the Costs of Equity for the Water Utilities Sample 2000 - 2009

	Authorized Returns on Equity[a/]	30-Year Treasury Rates[b/]	Risk Premiums
2000	11.13%	5.94%	5.19%
2001	10.89%	5.49%	5.40%
2002	10.67%	5.42%	5.25%
2003	10.67%	5.05%	5.62%
2004	10.48%	5.12%	5.36%
2005	10.48%	4.56%	5.92%
2006	10.47%	4.91%	5.56%
2007	10.45%	4.84%	5.61%
2008	10.11%	4.28%	5.83%
2009	10.11%	4.08%	6.03%
	10-Year Average Premium	4.97%	5.58%
	5-year Average Premium	4.53%	5.79%
	Average of forecasted interest rates for 2011-2013[c/]		5.03%
	Projected Returns on Equity		
	10-Year Average		10.6%
	5-Year Average		10.8%

Notes and Sources:

a/ Average of ROEs authorized at beginning of the indicated year as reported by AUS (formerly CA Turner) Utility Reports for various years for the water utilities sample.

b/ Reported by Federal Reserve or implied from 20-year Treasury rates .

c/ Source is Table 2.

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Table 17

Check on CAPM: Risk Premium Analyis Based on Averages of Annual DCF Equity Cost Estimates 2000 - 2009

	DCF Estimates of Cost of Equity-[a/]					
	Current Dividend Yield-[b/]	Average Growth Estimate	DCF Dividend Yield (D_1/P_0)-[c/]	Equity Cost Estimate	30-Year Treasury Rates-[b/]	Risk Premiums
2000	3.44%	6.63%	3.66%	10.29%	5.94%	4.35%
2001	3.38%	6.26%	3.59%	9.85%	5.49%	4.36%
2002	3.23%	6.55%	3.44%	9.99%	5.42%	4.57%
2003	3.43%	6.13%	3.64%	9.77%	5.05%	4.72%
2004	3.20%	7.44%	3.44%	10.88%	5.12%	5.76%
2005	2.87%	7.94%	3.09%	11.03%	4.56%	6.47%
2006	2.71%	8.03%	2.93%	10.95%	4.91%	6.04%
2007	2.73%	8.67%	2.97%	11.64%	4.84%	6.80%
2008	3.03%	9.45%	3.31%	12.76%	4.28%	8.48%
2009	3.51%	8.51%	3.81%	12.32%	4.08%	8.24%

10-Year Average Premium	5.98%
5-year Average Premium	7.21%
Average of forecasted Treasury rates-[d/]	5.03%
Projected Returns on Equity	
10-Year Average	11.0%
5-Year Average	12.2%

Notes and Sources:

_a/ Derived from data for utilities in the water utilties sample. Growth rates are averages of available forecasts made by analysts and Value Line.

_b/ Current dividend yields (D_0/P_0) are annual averages.

_c/ Expected yield = $D_1/P_0 = D_0/P_0 * (1 + g)$.

_d/ Source is Table 2.

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Arizona Water Company

Table 18

California Division of Ratepayer Advocates Staff Company-Specific Risk Analysis Applied to Arizona Water
Comparison to California Class A Water Utilities

California Class A Water Utilites[a]		2004	2005	2006	2007	2008	5-Year Average	TEST #1 Average Over (Under) Performance	Standard Deviation	TEST #2 Coeff. Of Variation
Suburban Water System[b]	Earned ROE	16.91%	17.74%	18.10%	19.16%	19.37%	18.26%	8.35%	1.02%	0.06
Response to VCC-1-8 (2003-2007)	Authorized ROE	9.84%	9.84%	9.84%	10.00%	10.00%	9.90%			
San Jose Water Company	Earned ROE	8.93%	7.97%	9.70%	10.33%	9.68%	9.32%	-0.67%	0.91%	0.10
Response to DRA-I-8 (2004-2008)	Authorized ROE	9.90%	9.90%	9.90%	10.13%	10.13%	9.99%			
San Gabriel Valley Water Company	Earned ROE	10.92%	14.24%	11.26%	8.66%	11.41%	11.30%	1.22%	1.99%	0.18
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.10%	10.10%	10.00%	10.00%	10.20%	10.08%			
Park Water Company	Earned ROE	9.42%	8.61%	11.55%	9.69%	6.03%	9.06%	-1.09%	2.01%	0.22
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.13%	10.13%	10.15%	10.18%	10.18%	10.15%			
Valencia Water Company	Earned ROE	8.87%	5.26%	7.85%	12.51%	8.80%	8.66%	-1.25%	2.60%	0.30
Response to DRA-1-8 (2004-2008)	Authorized ROE	9.72%	9.72%	9.72%	10.19%	10.19%	9.91%			
					Adjusted Avg[b]	Earned ROE	9.58%	-0.45%		
					Adjusted Avg[b]	Authorized ROE	10.03%		Average CV	0.20

		2005	2006	2007	2008	2009	5-Year Average	TEST #1		TEST #2
Arizona Water	Earned ROE	8.84%	9.06%	5.46%	4.22%	4.25%	6.37%	-3.04%	2.41%	0.38
	Authorized ROE	9.41%	9.41%	9.41%	9.41%	9.41%	9.41%			

	TEST #1	TEST #2
Relative Risk of Arizona Water Compared to Relative Risk of the Class A water utitlies	6.8	1.9
Relative Risk of Arizona Water Compared to Relative Risk of Valencia Water Company	2.4	1.3
Risk Premium for Arizona Water indicated by California DRA Staff Analysis	61	32

Notes and Sources:

a/ Attachment JRW-13, Exhibit DRA-1. CPUC Application 09-05-001. et. al.

b/ To be conservative, Suburban Water is not included in averages.

c/ Comparable five years of data used for Arizona Water.

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Arizona Water Company

Table 19

California Division of Ratepayer Advocates Staff Company-Specific Risk Analysis Applied to Arizona Water Comparison to Water Utilities Sample Adopted to Determine Benchmark Cost of Equity Estimates

Water Utilties Sample-[a]		2005	2006	2007	2008	2009	5-Year Average	TEST #1 Average Over (Under) Performance	Standard Deviation	TEST #2 Coeff. Of Variation
American States Water	Earned ROE	10.40%	8.40%	9.30%	7.20%	8.82%	8.82%	-1.29%	1.18%	0.13
	Authorized ROE	10.00%	9.87%	10.10%	10.10%	10.50%	10.11%			
Aqua America, Inc.	Earned ROE	11.50%	11.00%	10.00%	9.60%	9.60%	10.34%	0.21%	0.86%	0.08
	Authorized ROE	10.08%	10.08%	10.10%	10.18%	10.20%	10.13%			
California Water Service Group	Earned ROE	9.30%	8.40%	4.90%	10.10%	9.80%	8.50%	-1.66%	2.11%	0.25
	Authorized ROE	10.10%	10.10%	10.20%	10.20%	10.20%	10.16%			
Connecticut Water Services, Inc.	Earned ROE	12.00%	4.20%	8.90%	9.20%	9.78%	8.82%	-2.34%	2.85%	0.32
	Authorized ROE	12.70%	12.70%	10.13%	10.13%	10.13%	11.16%			
Middlesex Water Company	Earned ROE	8.40%	10.00%	8.80%	8.80%	7.04%	8.61%	-1.41%	1.06%	0.12
	Authorized ROE	10.04%	10.04%	10.00%	10.00%	10.00%	10.02%			
SJW Corp.	Earned ROE	11.50%	18.20%	8.30%	11.20%	5.98%	11.04%	0.96%	4.60%	0.42
	Authorized ROE	9.90%	10.10%	10.13%	10.13%	10.13%	10.08%			
					Average	Earned ROE	9.35%	-0.92%	Average CV	0.22
					Average	Authorized ROE	10.28%			

		2005	2006	2007	2008	2009	5-Year Average	TEST #1		TEST #2
Arizona Water-[c]	Earned ROE	8.84%	9.06%	5.46%	4.22%	4.25%	6.37%	-3.04%	2.41%	0.38
	Authorized ROE	9.41%	9.41%	9.41%	9.41%	9.41%	9.41%			
Relative Risk of Arizona Water Compared to Relative Risk of Water Utilties Sample								**3.3**		**1.7**

Notes and Sources:

a/ Attachment JRW-13, Exhibit DRA-1. CPUC Application 09-05-001. et. al. for data through 2008. Data for 2009 from AUS Utility Reports and SEC 10 K's.

b/ American Water Works not included due to lack of data. Pennichuck and Southwest Water were in outside expert's sample. They are not included because they are not generally included by Arizona Corporation Commission Staff in an appropriate water utilities s+A18ample.

c/ Most recent five years of data for Arizona Water.

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Arizona Water Company

Table 20

Summary Table: Estimated Costs of Equity for Arizona Water Company

	Estimates of Benchmark Cost of Equity for Water Utilities Sample			Estimates of the Cost of Equity for Arizona Water[a]		
DCF Estimates						
DCF analysis -- Table 10	12.3%	to	12.4%	12.8%	to	12.9%
DCF analysis -- Table 11	11.6%	to	11.6%	12.1%	to	12.1%
DCF Average		12.0%			12.5%	
CAPM Estimates						
CAPM -- Table 12		10.2%			10.7%	
CAPM -- Table 13		12.2%			12.7%	
CAPM Average		11.2%			11.7%	
Risk Premium Checks on CAPM Estimates						
Check on CAPM -- Table 16	10.6%	to	10.8%	11.1%	to	11.3%
Check on CAPM -- Table 17	11.0%	to	12.2%	11.5%	to	12.7%
Range of checks on CAPM	10.6%	to	12.2%	11.1%	to	12.7%
Range of Cost of Equity Estimates[b]	10.9%	to	12.3%	11.4%	to	12.8%
Recommended ROE					12.1%	

Notes:
a/ Arizona Water cost of equity estimates include a 50 basis point risk premium.
b/ Cost of Equity determined with Staff method of giving equal weight to DCF and CAPM estimates.

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NORTH-HOLLAND

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Short communication

Utility stocks and the size effect—revisited

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Abstract

Wong concluded there is weak empirical support that firm size is a missing factor from the capital asset pricing model for industrial stocks but not for utility stocks. Her weak results, however, do not rule out the possibility of a small firm effect for utilities. The issue she addressed has important financial implications in regulated proceedings that set rates of return for utilities. New studies based on different size water utilities are presented that do support a small firm effect in the utility industry.

Keywords: Utility stocks; Beta risk; Firm size

Annie Wong concludes there is some weak evidence that firm size is a missing factor from the capital asset pricing model ("CAPM") for industrial stocks but not for utility stocks (Wong, 1993, p. 98). This "firm size effect" is an observation that small firms tend to earn higher returns than larger firms after controlling for differences in estimates of beta risk in the CAPM. Wong notes that if the size effect exists, it has important implications and should be considered by regulators when they determine fair rates of return for public utilities. This paper re-examines the basis for her conclusions and presents new information that indicates there is a small firm effect in the utility sector.

1. Reconsideration of the evidence provided by Wong

Wong relies on Barry and Brown (1984) and Brauer (1986) to suggest the small firm effect may be explained by differences in information available to investors of small and large firms.

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She states that requirements to file reports and information generated during regulatory proceedings indicate the same amount of information is available for large and small utilities and thus, if the differential information hypothesis explains the small firm effect, then the uniformity of information available among utility firms would suggest the size effect should not be observed in the utility industry. But contrary to the facts she assumes, there are differences in information available for large and small utilities. More parties participate in proceedings for large utilities and thus generate more information. Also, in some jurisdictions smaller utilities are not required to file all of the information that is required of larger firms. Thus, if the small firm effect is explained by differential information, contrary to Wong's hypothesis, differences in available information suggests there is a small firm effect in the utility industry. Wong did not discuss other potential explanations of the small firm effect for utilities.[2]

Wong's empirical results are not strong enough to conclude that beta risks of utilities are unrelated to size. In the period 1963–1967, when monthly data were used to estimate betas, her estimates of utility betas as well as industrial betas increased as the size of the firms decreased, but she did not find the same inverse relationship between size and beta risk for utilities in other periods. Being unable to demonstrate a relationship between size and beta in other periods may be the result of Wong using monthly, weekly and daily data to make those beta estimates. Roll (1980) concluded trading infrequency seems to be a powerful cause of bias in beta risk estimates when time intervals of a month or less are used to estimate betas for small stocks. When a small stock is thinly traded, its stock price does not reflect the movement of the market, which drives down the apparent covariance with the market and creates an artificially low beta estimate.

Ibbotson Associates (2002) found that when annual data are used to estimate betas, beta estimates for the smaller firms increase more than beta estimates for larger firms. Table 1 compares Value Line (2000) beta estimates for three relatively small water utilities that are made with weekly data and an adjusted beta estimated with pooled annual data for the utilities for the 5-year period ending in December 2000. In making the latter estimate, it is assumed that the underlying beta for each of water utilities is the same. The t-statistics for the unadjusted beta

Table 1
Beta estimates reported by Value Line and estimated with pooled annual returns for relatively small water utilities

	Value Line[a]	Estimated with annual data[b]
Connecticut Water Service	0.45	
Middlesex Water	0.45	
SJW Corporation	0.50	
Average	0.47	0.78
t-statistic		2.72[c,d]

[a] As reported in Value Line (2000). Betas estimated with 5 years of weekly data.

[b] Estimated with pooled annual return premiums for the 5-year period ending December 2000. Proxy market returns are total returns for the S&P 500 index. Dummy variable in 1999 to reflect the proposed acquisition of SJW Corporation included in analysis.

[c] Significant at the 95% level.

[d] The t-statistic for the null hypothesis that the true beta is 0.18 (the derived unadjusted Value Line beta) when the estimated betas is 0.65 (the unadjusted estimated beta) is 1.97. It is significant at the 95% level.

estimate is reported in parentheses. As was found by Ibbotson Associates (2002) for stocks in general, when annual data are used to estimate betas for small utility stocks, the beta estimate increases.

Wong used the Fama and MacBeth (1973) approach to estimate how well firm size and beta explain future returns in four periods. She reports weak empirical results for both the industrial and utility sectors. In every one of the statistical results reported for utilities, the coefficient for the size effect has a negative sign as would be expected if there is a size effect in the utility industry but only one of the results was found to be statistically significant at the 5% level. With the industrial sector, though she found two cases to have a significant size effect, a negative sign for the size coefficient occurred only 75% of the time. What is puzzling is that with these weak results, Wong concludes the analysis provides support for the small firm effect for the industrial industry but no support for a small firm effect for the utility industry.

2. New evidence on risk premiums required by small utilities

Two other studies support a conclusion that small utilities are more risky than larger ones. A study made by Staff of the Water Utilities Branch of the California Public Utilities Commission Advisory and Compliance Division (CPUC Staff, 1991) used proxies for beta risk and determined small water utilities were more risky than larger water utilities. Part of the difficulty with examining the question of relative risk of utilities is that the very small utilities are not publicly-traded. This CPUC Staff study addressed that concern by computing proxies for beta risk estimated with accounting data for the period 1981–1991 for 58 water utilities. Based on that analysis, CPUC Staff concluded that smaller water utilities were more risky and required higher equity returns than larger water utilities. Following 8 days of hearings and testimony by 21 witnesses regarding this study, it was adopted by the California Public Utilities Commission in CPUC Decision 92-03-093, dated March 31, 1992.

Table 2 provides the results of another study of differences in required returns estimated from discounted cash flow ("DCF") model estimates of the costs of equity for water utilities of different sizes. The study compares average estimates of equity costs for two smaller water utilities, Dominguez Water Company and SJW Corporation, with equity cost estimates for two larger companies, California Water Service and American States Water, for the period 1987–1997. All four utilities operated primarily in the same regulatory jurisdiction during that period. Estimates of future growth are required to make DCF estimates. Gordon, Gordon, and Gould (1989) found that a consensus of analysts' forecasts of earnings per share for the next 5 years provides a more accurate estimate of growth required in the DCF model than three different historical measures of growth. Unfortunately, such analysts' forecasts are not generally available for small utilities and thus this study assumes, as was assumed by staff at the regulatory commission, that investors relied upon past measures of growth to forecast the future. The results in Table 2 show that the smaller water utilities had a cost of equity that, on average, was 99 basis points higher than the average cost of equity for the larger water utilities. This result is statistically significant at the 90% level. In terms of the issues being addressed by Wong, the 99 basis points could be the result of differences in beta risk, the small firm effect or some combination of the two.

Table 2
Small firm equity cost differential: case study based on a comparison of DCF equity cost estimates for larger and smaller California water utilities (1987–1997)

	Larger water utilities[a]			Smaller water utilities[b]			Smaller utilities minus larger utilities
	D_0/P_0 (%)	Estimated growth (%)[c]	Equity cost estimate (%)[d]	D_0/P_0 (%)	Estimated growth (%)[c]	Equity cost estimate (%)[d]	
1987	6.60	7.17	14.24	5.38	10.06	15.98	1.74
1988	6.75	6.30	13.48	5.81	9.08	15.42	1.94
1989	7.10	6.30	13.84	6.47	7.00	13.93	0.09
1990	7.24	6.19	13.87	6.96	7.51	14.99	1.11
1991	6.94	6.29	13.67	6.64	6.24	13.30	−0.36
1992	6.18	5.96	12.50	6.50	6.71	13.65	1.14
1993	5.32	5.68	11.30	5.49	6.31	12.15	0.85
1994	6.03	4.40	10.70	5.80	4.86	10.94	0.25
1995	6.44	3.86	10.55	6.44	4.88	11.64	1.09
1996	5.60	4.06	9.88	5.77	5.58	11.67	1.79
1997	4.93	3.31	8.40	4.52	4.89	9.64	1.23
Averarage difference							0.99
t-statistic							1.405[e]

Limited to period for which Dominguez Water Company data were available. 1998 excluded due to pending buyout.

[a] American States Water and California Water Service.

[b] Dominguez Water Company and SJW Corporation.

[c] Average of 5- and 10-year dividends per share growth, 10-year earnings per share growth and *estimates of sustainable* growth from internal and external sources for the most recent 10-year period when data are available (1991–1997), otherwise most recent 5-year period (1987–1990).

[d] DCF equity cost as computed by California PUC staff: $k = (D_0/P_0) \times (1 + g) + g$.

[e] Significant at the 90% level.

3. Concluding remarks

Wong's concluding remarks should be re-examined and placed in perspective. She noted that industrial betas tend to decrease with increases in firm size but the same relationship is not found in every period for utilities. Had longer time intervals been used to estimated betas, as was done in Table 1, she may have found the same inverse relationship between size and beta risk for utilities in other periods. She also concludes "there is some weak evidence that firm size is a missing factor from the CAPM for the industrial but not the utility stocks" (Wong, 1993, p. 98), but the weak evidence provides little support for a small firm effect existing or not existing in either the industrial or utility sector. Two other studies discussed here support a conclusion that smaller water utility stocks are more risky than larger ones. To the extent that water utilities are representative of all utilities, there is support for smaller utilities being more risky than larger ones.

Notes

1. Vice President.
2. The small firm effect could also be a proxy for numerous other omitted risk differences between large and small utilities. An obvious candidate is differentials in access to financial markets created by size. Some very small utilities are unable to borrow money without backing of the owner. Other small utilities are limited to private placements of debt and have no access to the more liquid financial markets available to larger utilities.

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TMZ-4

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

In the Matter of the Application of San Jose Water Company (U168W) for Authority to Determine Its Cost of Capital and to Apply that Cost of Capital in Rates for the Period From January 1, 2010 through December 31, 2012.	Application 09-05-001 (Filed May 1, 2009)
In the Matter of the Application of Valencia Water Company (U342W) for Authority to Adjust Its Cost of Capital and to Reflect That cost of Capital in Its Rates for the Period from January 1, 2010 through December 31, 2012.	Application 09-05-002 (Filed May 1, 2009)
Joint Application of Park Water Company (U314W) and Apple Valley Ranchos Water Company (U346W) for Authority to Establish Authorized Cost of Capital.	Application 09-05-003 (Filed May 1, 2009)
In the Matter of the Application of San Gabriel Valley Water Company (U337W) for an Authorized Cost of Capital for 2010 through 2012.	Application 09-05-004 (Filed May 1, 2009)
Application of Suburban Water Systems (U339W) For an Authorized Cost of Capital for Utility Operations for 2009.	Application 09-05-005 (Filed May 1, 2009)

Testimony of

Dr. J. Randall Woolridge

on Behalf of the Division of Ratepayer Advocates

Cost of Capital

July 10, 2009

Q. PLEASE NOW REVIEW YOUR RELATIVE RISK STUDY OF THE CALIFORNIA WATER COMPANIES.

A. To gauge the relative riskiness of the California water companies, I have performed a study of the authorized versus earned ROEs for the five California water companies and the Water Proxy Group. The results are presented on pages 3 (the five California Class A water companies) and 4 (the Water Proxy Group) of Attachment JRW-13. I performed two risk assessments. First, I compared the earned versus the authorized ROEs over the past five years. In this test, under earning an authorized ROE is an indication of higher risk. Second, I computed the Coefficient of Variation ("CV") of the earned ROEs over the past five years. The CV, computed as the standard deviation (ROE)/mean (ROE), is a standardized measure of volatility or dispersion. As such, it allows for comparison between observations. In this test, a higher CV indicates higher risk.

With respect to earned versus authorized ROEs, the results for the California Water companies are significantly affected by the very high ROEs for Suburban. Hence I am using the median as a measure of central tendency. Over the past five years, the Class A California Water Companies under earned their authorized ROEs, with a median level of underperformance of -0.67%. The range goes from +8.35% for Suburban to -1.25% for Valencia. By comparison, the median level of underperformance for the Water Proxy Group is -1.70%. The range for the Water Proxy Group goes from +2.07% for SJW Corp. to -5.03% for Southwest Water. As such, the level of underperformance is greater for the Water Proxy Group than for the five Class A California Water Companies. In the second test, the average CV for the five California Water Companies is 0.17, with a range from 0.06 (Suburban) to 0.30 (Park Water). The average CV for the Water Proxy Group is 0.28, with a range from 0.08 (Aqua America) to 0.67 (Pennichuck). The CV test also indicates that the riskiness of the Water Proxy Group is greater than the California Water Companies.

Q. WHAT DO THESE RESULTS INDICATE ABOUT THE RISKINESS OF THE CLASS A CALIFORNIA WATER COMPANIES RELATIVE TO THE WATER PROXY GROUP?

A. These results indicate that, on average, the Class A California water companies are less risky than the Water Proxy Group. As such, the equity cost rate results for the Water Proxy Group are applicable to the five Class A California water companies. The CPUC has traditionally provided for a premium for smaller water companies. My relative risk studies indicate that no such premium is needed. Nonetheless, the CPUC may be interested in assessing the relative riskiness of the five Class A California water companies. To this end, I have averaged the results of my two risk studies to assess the relative risk of the five Class A California water companies. These results are presented Panel A of page 5 of Attachment JRW-13. These results indicate that Suburban is the least risky of the five companies. San Jose and San Gabriel are in the middle in terms of risk, and Park and Valencia are the riskiest of the five.

Q. BASED ON THESE RESULTS, WHAT RISK PREMIUM ADJUSTMENTS ARE YOU MAKING TO THE BENCHMARK ROE OF 9.75% FOR THE FIVE CLASS A WATER COMPANIES?

A. Since the five Class A water companies are, overall, a little less risky than the Water Proxy Group, you could argue that no risk adjustment is necessary. However, the range of the risk premium study results indicates that some of the Class A water companies are somewhat riskier than the average of the Water Proxy Group, and some are somewhat less riskier than the average of the Water Proxy Group. Therefore, some form of adjustment may be in order.

Panel B on page 5 of Attachment JRW-13 shows a summary analysis. Park and Valencia are rated the riskiest based on the average relative risk ranking. I propose a 25 basis points ("BPs") risk premium for these companies. However, since Park just got a risk-reducing decoupling mechanism in the form of a Water Revenue Adjustment Mechanism ("WRAM"), I am withholding the 25 BP risk adjustment for Park. The average relative risk ranking results place San Jose and San Gabriel in the middle of the pack, and therefore I am making no ROE adjustment for those two companies. Finally, Suburban's average relative risk ranking clearly indicates a low risk profile. Therefore, I will make a 25 BP reduction to the benchmark ROE to reflect the low level of risk for Suburban.

Thus, DRA's recommended ROEs for the utilities are: 1) Suburban – 9.50%; 2) San Jose – 9.75%; 3) San Gabriel – 9.75%; 4) Park – 9.75%; and, 5) Valencia – 10.00%.

Q. PLEASE ADDRESS UTILITIES' CLAIMS REGARDING UNIQUE BUSINESS AND REGULATORY RISK.

A. Witnesses for Park, Leigh K. Jordan (PWAV-1), San Gabriel, Michael L. Whitehead, (SG-2), Suburban Robert Kelly (SUB-1), and Valencia Greg Milleman (VW-1) raise firm-specific risk factors to support the ROE risk premiums being proposed by their cost of equity expert witnesses. Park, San Gabriel, and Suburban fail to quantify what portion of the ROE risk premium requested is associated with the unique business and regulatory firm–specific risks they assert. Many of the arguments raised are not new and have been raised numerous times by these and other water utilities in prior cost of capital proceedings, such as:

- Regulatory risk
- Risk of litigating water quality lawsuits
- Utility size and ownership structure

Relative Risk Study Using Earned and Authorized ROEs

California Water Companies

		2004	2005	2006	2007	2008	Average	Average Over (Under) Performance	Standard Deviation	Coeff. Of Variation
Suburban Water System*	Earned ROE	16.91%	17.74%	18.10%	19.16%	19.37%	18.26%	8.35%	1.02%	0.06
Response to VCC-1-8 (2003-2007)	Authorized ROE	9.84%	9.84%	9.84%	10.00%	10.00%	9.90%			
San Jose Water Company	Earned ROE	8.93%	7.97%	9.70%	10.33%	9.68%	9.32%	-0.67%	0.91%	0.10
Response to DRA-1-8 (2004-2008)	Authorized ROE	9.90%	9.90%	9.90%	10.13%	10.13%	9.99%			
San Gabriel Valley Water Company	Earned ROE	10.92%	14.24%	11.26%	8.66%	11.41%	11.30%	1.22%	1.99%	0.18
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.10%	10.10%	10.00%	10.00%	10.20%	10.08%			
Park Water Company	Earned ROE	9.42%	8.61%	11.55%	9.69%	6.03%	9.06%	-1.09%	2.01%	0.22
Response to DRA-1-8 (2004-2008)	Authorized ROE	10.13%	10.13%	10.15%	10.18%	10.18%	10.15%			
Valencia Water Company	Earned ROE	8.87%	5.26%	7.85%	12.51%	8.80%	8.66%	-1.25%	2.60%	0.30
Response to DRA-1-8 (2004-2008)	Authorized ROE	9.72%	9.72%	9.72%	10.19%	10.19%	9.91%			
* Data for Suburban is 2003-2007					Average	Earned ROE	11.32%	1.31%	Average	
					Average	Authorized ROE	10.01%		CV	0.17
					Median	Earned ROE	9.32%	-0.67%		
					Median	Authorized ROE	9.99%			

Relative Risk Study Using Earned and Authorized ROEs

Water Proxy Group

		2004	2005	2006	2007	2008	Average	Average Over (Under) Performance	Standard Deviation	Coeff. Of Variation
American States Water	Earned ROE	8.00%	10.40%	8.40%	9.30%	7.20%	8.66%	-1.35%	1.23%	0.14
	Authorized ROE	10.00%	10.00%	9.87%	10.10%	10.10%	10.01%			
Aqua America, Inc.	Earned ROE	11.40%	11.50%	11.00%	10.00%	9.60%	10.70%	0.60%	0.85%	0.08
	Authorized ROE	10.08%	10.08%	10.08%	10.10%	10.18%	10.10%			
Artesian Resources Corp.	Earned ROE				8.50%	7.40%	7.95%	-2.30%		
	Authorized ROE				10.25%	10.25%	10.25%			
California Water Service Group	Earned ROE	9.80%	9.30%	8.40%	4.90%	10.10%	8.50%	-1.56%	2.11%	0.25
	Authorized ROE	9.70%	10.10%	10.10%	10.20%	10.20%	10.06%			
Connecticut Water Services, Inc.	Earned ROE	10.90%	12.00%	4.20%	8.90%	9.20%	9.04%	-2.63%	2.99%	0.33
	Authorized ROE	12.70%	12.70%	12.70%	10.13%	10.13%	11.67%			
Middlesex Water Company	Earned ROE	5.60%	8.40%	10.00%	8.80%	8.80%	8.32%	-1.70%	1.63%	0.20
	Authorized ROE	10.04%	10.04%	10.04%	10.00%	10.00%	10.02%			
Pennichuck Corporation	Earned ROE	6.00%	3.90%	0.30%	7.90%	10.10%	5.64%	-4.26%	3.76%	0.67
	Authorized ROE	10.00%	10.00%	10.00%	9.75%	9.75%	9.90%			
SJW Corp.	Earned ROE	11.30%	11.50%	18.20%	8.30%	11.20%	12.10%	2.07%	3.66%	0.30
	Authorized ROE	9.90%	9.90%	10.10%	10.13%	10.13%	10.03%			
Southwest Water Company	Earned ROE	4.40%	5.40%	4.80%			4.87%	-5.03%		
	Authorized ROE	9.84%	9.84%	10.00%			9.89%			
* Artesian and Southwest not included in CV study due to lack of data					Average	Earned ROE	8.42%	-1.80%	Average	
Data Source: *AUS Utility Reports*, various issues.					Average	Authorized ROE	10.22%		CV	0.28

Summary of Company-Specific Risk Premium Analyses

Panel A
Risk Ranking

	Earned Versus Authorized ROE	CV Earned ROE	Average Relative Risk Ranking
Suburban Water System	1.0	1.0	1.0
San Jose Water Company	3.0	2.0	2.5
San Gabriel Valley Water Company	2.0	3.0	2.5
Park Water Company	4.0	5.0	4.5
Valencia Water Company	5.0	4.0	4.5

Panel B
Risk Premiums for Class A Water Companies

	Average Relative Risk Ranking	ROE Premium/ Discount	Recommended ROE
Suburban Water System	1.0	-0.25%	9.50%
San Jose Water Company	2.5	0.00%	9.75%
San Gabriel Valley Water Company	2.5	0.00%	9.75%
Park Water Company*	4.5	0.00%	9.75%
Valencia Water Company	4.5	0.25%	10.00%

* Based on risk ranking, Park deserves a 25 basis point premium. But since Park now has a WRAM in place, the premium will not be added due to the risk reducung aspects of the WRAM

ARIZONA WATER COMPANY

Docket No. W-01445A-10-_____

W-01445A-10-0517

2010 RATE HEARING

For Test Year Ending 12/31/09

PREPARED

DIRECT TESTIMONY & EXHIBITS

OF

Fredrick K. Schneider

TABLE OF CONTENTS

APPENDICES AND EXHIBITS

ARIZONA WATER COMPANY

Direct Testimony of

Fredrick K. Schneider

I. Introduction and Qualifications

Q. PLEASE STATE YOUR NAME, EMPLOYER AND OCCUPATION.

A. My name is Fredrick K. Schneider. I am employed by Arizona Water Company (the "Company") as Vice President of Engineering. My business address is 3805 N. Black Canyon Highway, Phoenix, Arizona 85015.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I graduated in 1990 with a Bachelor of Science degree in Hydrology from the College of Engineering and Mines at the University of Arizona, in Tucson, Arizona. Additionally, I have taken graduate level classes at the University of Phoenix.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE.

A. In 1987, I began working for the United States Department of Agriculture performing chemical and granular gradation laboratory soils analysis. In 1988, I accepted a position with the City of Tucson as an Engineering Intern in their Engineering department performing civil engineering site reviews, and later transferred to the Water department working on groundwater modeling, environmental remediation and groundwater contamination investigation until I graduated from the University of Arizona in 1990.

Upon obtaining my degree, I joined Boyle Engineering Corporation in Phoenix, Arizona as an Assistant Engineer and was later promoted to the position of Associate Engineer. Boyle Engineering provides consulting engineering services to the public and private sectors in the areas of water and wastewater. During this time, I was involved in a variety of consulting assignments, including all phases of system planning and design, reconnaissance level investigations, feasibility studies and construction phase services, including water and wastewater master planning, groundwater supply development, surface water supply development, storage reservoir design and construction, treatment facilities, pipeline systems, wastewater collection, treatment and disposal.

In 1995, I accepted a position with Wood, Patel and Associates in Phoenix, Arizona. During that time, my duties consisted of engineering design and project management for various water and wastewater pipeline feasibility analyses, evaluation of alternatives, cost estimating, detailed hydraulic analysis and master planning new developments ranging in size from several hundred to several thousand acres.

In 1998, I joined Citizens Water Resources ("Citizens") as a Senior Development Engineer. I was later promoted to the position of Development Services Supervisor, where I negotiated development agreements, reviewed water and wastewater master plans and facility infrastructure plans, and was responsible for the inspection and approval of constructed facilities for projects within the metropolitan Phoenix area. I became an employee of Arizona American Water Company ("Arizona-American") when its parent company, American Water Company, purchased the water and wastewater assets of Citizens on January 15, 2001, and was subsequently promoted to the position of Development Services Manager, responsible for the same duties described above statewide. In 2003, I moved from engineering to the operations area when I was promoted to the position of Manager of Arizona-American. In that position, I was responsible for the operations of all of Arizona-American's water and wastewater treatment facilities, distribution and collection facilities and customer service. In May 2004, I was promoted to the position of Director of Engineering for American Water Company's Western Region, where my responsibilities included overseeing all capital planning and engineering activities for American Water Company's operations in Arizona, California, Hawaii, New Mexico and Texas.

In October 2005, I accepted a position as an Associate of Brown and Caldwell, managing the Phoenix Infrastructure department including the design, project management and construction administration of water and wastewater infrastructure projects within the metropolitan Phoenix area.

In August 2007, I joined Arizona Water Company as Vice President of Engineering. My responsibilities now include capital planning, design and construction management of all of the Company's engineering projects.

Q. ARE YOU A MEMBER OF ANY PROFESSIONAL ORGANIZATIONS?

A. Yes. I am a member of the American Water Works Association ("AWWA") and the Arizona Water Association (formerly Arizona Water and Pollution Control Association). I am also an active member of the Infrastructure Replacement Group of the Blue Ribbon Panel on Sustainability, a panel formed to address water sustainability that is jointly chaired by the Arizona Corporation Commission (the "Commission"), the Arizona Department of Water Resources ("ADWR") and the Arizona Department of Environmental Quality ("ADEQ").

Q. ARE YOU A REGISTERED PROFESSIONAL ENGINEER?

A. Yes. I have been a registered professional engineer in the State of Arizona continuously since 1995.

Q. DO YOU HAVE ANY OTHER CERTIFICATIONS?

A. Yes. I am an ADEQ Grade 2 certified operator in Water and Wastewater Treatment and a Grade 3 certified operator in Water Distribution and Wastewater Collection.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE COMMISSION?

A. Yes. I have previously testified in rate proceedings and Certificate of Convenience and Necessity ("CCN") hearings before the Commission. In addition, I have testified in California before the California Public Utilities Commission and prepared pre-filed testimony in Hawaii and New Mexico. I testified in the Company's last rate application proceeding for the total Company (*see* Docket No. W-01445A-08-0440).

II. <u>Purpose and Extent of Direct Testimony</u>

Q. WHAT IS THE PURPOSE AND EXTENT OF YOUR DIRECT TESTIMONY?

A. For ratemaking purposes, the Company's water systems are divided into three groups, the Western, Eastern and Northern Groups. My testimony concerns the Western Group, which is comprised of the Ajo, Pinal Valley and White Tank water systems. The Pinal Valley water system ("PVWS") is comprised of the Casa Grande, Coolidge and Stanfield water systems, which were consolidated in Decision No. 71845. My direct testimony discusses critical and necessary post-Test Year plant additions in the Pinal Valley and White Tank water systems and at the Phoenix corporate office, the reasons why such additions should be included in this rate case, the Company's planning and budgeting process for the construction of plant additions and improvements and a description of the Company-funded utility plant additions since the last rate proceeding. My direct testimony also discusses proposed arsenic treatment plant additions in Pinal Valley, transmission and distribution system maintenance costs, and the Company's proposed surface water treatment plant and related water infrastructure in Pinal Valley associated with the Off-Site Facilities Fee. The last topic of my direct testimony discusses lost and unaccounted for water which I characterize as system water losses throughout this direct testimony, the required service line and water main replacements required to reduce water loss in the PVWS to comply with Commission directives in Decision No. 71845.

III. Post-Test Year Plant Additions

Q. IS THE COMPANY PROPOSING ANY POST-TEST YEAR PLANT ADDITIONS?

A. Yes. The Company is proposing post-Test Year Plant Additions for the Pinal Valley and White Tank water systems, as well as for the Phoenix Office.

Q. PLEASE DESCRIBE THOSE ADDITIONS.

A. The projects are identified and described below by water system. Exhibit FKS-1 contains detailed project information and facts describing the utility plant improvements and supporting data.

A. Pinal Valley:

Pinal Valley – Coolidge Airport Waterline Replacement (WA 1-4768) – In Decision No. 71845, the Commission ordered the Company to reduce water loss in all of its systems to less than ten percent by July 1, 2011. Based on the Company's detailed water loss evaluation of the Coolidge Airport water system, it determined that a significant portion of the 6-inch waterline dating back to the 1930s was failing and needed to be replaced. The repair history shows numerous instances of leaks in 2010, the Company completed sixteen separate repairs on the Coolidge Airport water system as shown in Exhibit FKS-1. Based on the frequency and history of breaks and leaks, the Company suspects that there are significant undiscovered leaks likely in this water system that are not visible due to the sandy soil. The Company followed the proposed alignment of the new roadway established in the City of Coolidge Airport master plan for construction of the new waterline. Replacement of this aging and failing pipe will dramatically reduce water losses in the Coolidge Airport water system and maintain reliable and adequate water service. Fire flows and pressures will be improved and the frequent pipe failures and main breaks caused by constant pump cycling and deteriorating water mains will be reduced. The Company received the Approval to Construct ("ATC") from Arizona Department of Environmental Quality ("ADEQ") on October 25, 2010 and will be completed by the July 1, 2011 deadline. Water main repair history is included in Exhibit FKS-1. Copies of the construction plans, construction schedule and proposal/contract are included in Exhibit FKS-1. This project was required for the Company to comply with the Commission's order in Decision No. 71845 for the Company to reduce water losses right away. Because of the Company's replacement of this aging and leaking water main and its water loss reduction efforts, the Company expects water loss in the Coolidge Airport water system to be significantly reduced and in compliance with the Commission's directive in Decision No. 71845. This project will be placed in service on or about January 28, 2011.

Pinal Valley – Coolidge Old Town Waterline Replacement (WA 1-4772) – As stated above, in Decision No. 71845 the Commission ordered the Company to reduce system water loss to less than ten percent by July 1, 2011. This waterline replacement project replaces three waterlines located in alleyways between Coolidge and Elm Avenues and from Main Street to Arizona Boulevard (State Highway 87). The Cement Asbestos ("CA") pipe being replaced dates back to the 1930s and 1940s, comprises approximately 6,200 LF of 3 and 4-inch CA pipe, and 200 LF of 6-inch CA pipe. The failing water main is being replaced with 4,200 LF of 6-inch C-900 Polyvinyl Chloride ("PVC") pipe and 2,200 LF of 12-inch C-900 PVC pipe. These main replacement projects were undertaken because the existing failing water mains developed a higher than average number of leaks and the Company's employees have installed numerous repair clamps on these aging waterlines as shown in the repair table included in Exhibit FKS-1 and specifically have repaired or worked on these sections of water main nearly sixty times since 2005. In addition to the excessive age of these water mains, the frequency and severity of leaks and breaks have been compounded by Tamarack (Salt Cedar) tree roots growing into the couplings of the main, resulting in coupling leaks or breaks as shown in the photos included in Exhibit FKS-1. These types of leaks usually go undetected for years since they are typically not visible. All of these main replacements are specifically designed to reduce water losses within the Coolidge area of the PVWS, and comply with Decision No. 71845. This project will be completed and placed in service on or near April 22, 2011.

Pinal Valley – Valley Farms Waterline Replacement (WA 1-4773) – This waterline replacement project replaces a waterline located in the Valley Farms portion of the Coolidge water system along Vah Ki Inn Road from Rhodes Court to McGee Road and along Moore Circle from Vah Ki Inn Road to McGee Road. This water line has developed nearly thirty leaks as shown in Exhibit FKS-1. A significant portion of this waterline was installed in the 1930s when rolled rubber joint gaskets were used. These types of gaskets tend to leak and blow out and are no longer used. This project replaces approximately 2,400 LF of 6-inch CA pipe with 1,250 LF of 12-inch C-1,100 PVC pipe and 700 LF of 6-inch C-900 PVC pipe. Completion of this project is critical to the Company's compliance with the Commission's order in Decision No. 71845 that the Company reduce water loss in all of its water systems including the Coolidge area of the PVWS. This project will be completed and placed in service on or near April 15, 2011.

Pinal Valley – SCADA Phase 3 (WA 1-4470) – This project comprises the Supervisory Control And Data Acquisition ("SCADA") design, construction and programming for the two largest arsenic treatment plants, and 11 wells that supply water to these arsenic treatment plants. The production from these two arsenic treatment plants supply over half (approximately 55 percent) of the

PVWS production. The SCADA system monitors over 70 critical arsenic treatment processes. Those processes are included in Exhibit FKS-1. The previous process control system utilized 40-year-old technology and was not capable of adequately monitoring and controlling the numerous processes required to ensure consistent and reliable plant operation. A failure of any of these processes could result in a failure of the arsenic treatment plant and result in non-compliance with the federally mandated arsenic MCL. Installation of this control equipment provides a significantly greater level of protection against possible plant failure. The SCADA system automates and monitors several plant functions and provides remote monitoring and alarms. The SCADA system also provides process trending, which enables the operators to optimize plant operation and efficiently manage treatment costs. A summary of the project specifications, master plan and design plans are included in Exhibit FKS-1. The Company completed this SCADA project to provide for remote monitoring and control of these two arsenic treatment plants and their associated wells to comply with the new federally mandated arsenic MCL. This work was completed and placed in service on July 29, 2010.

<u>Pinal Valley – Well No. 27 Storage Tank and Booster Pump Station (WA 1-4620)</u>

This project consisted of constructing a new booster pump station and relocating an existing 6,000 gallon storage tank from the Company's Stanfield water system. This portion of the distribution system operates at pressures over 150 psi. Pressure graph and charts are included in Exhibit FKS-1. Historically, Well No. 27 has pumped directly into the distribution system. But, the high distribution system pressure, combined with the well pumping water level, necessitated the use of a custom built, double-bolted ductile iron pump to handle the resulting pressure and hydraulic thrust. The well pump hydraulic calculations showing the need for this custom built pump assembly is included in Exhibit FKS-1. The high pressure design made it difficult to control the pumping rate during well start-up, and resulted in excessive draw down and cavitation of the pump as shown in the pump curve included in Exhibit FKS-1. Pump cavitation can cause excessive wear on impellers and significantly reduces the life of a pump. The increased draw down after start-up, combined with system pressure fluctuations, resulted in excessive thrust loading of the pump. These conditions combined to cause historic premature pump failure. The well pump was recently replaced on October 26, 2007 and November 29, 2008, much sooner than that of a typical well pump. The most cost-effective way to reduce the pumping pressure was to allow the well to pump into a ground storage tank and to install a booster pump station to pump the water into the distribution system, effectively splitting the pressure requirement between the two pumps. (See pump design work papers included in Exhibit FKS-1) The new design is more reliable and stabilizes system pressures. Additionally, a connection was installed from the lower pressure zone into the new storage tank as depicted on the construction drawings included in Exhibit FKS-1. The installation of the tank and construction of the booster pump allows additional water supplies to be delivered to the upper pressure zone of the Casa Grande portion of the water system, thereby supplementing the limited supply available to this portion of the PVWS, and increasing the system's reliability. Well No. 27 is the only well supply in the upper pressure zone. This upgrade advanced the adequacy of supply and improved pressures to this portion of the system. This work was completed and placed in service on July 28, 2010.

<u>Pinal Valley – Coolidge Airport Well No. 1 Rehabilitation (WA 1-4675)</u> – In 2009, one of the two wells serving this water system failed. After the contractor removed the pump and completed a video inspection of the well, the well casing showed signs of extensive deterioration and was on the verge of collapse. A

summary of the well video is included in Exhibit FKS-1. The well pump assembly was removed and replaced due to excessive wear (See photos included in Exhibit FKS-1), and the well pump discharge head assembly was replaced because it was no longer serviceable. Due to extensive well casing deterioration, a new well liner was also installed to extend the life of this well. Additionally, a concrete well sanitary seal was installed as required by Arizona Department of Water Resources ("ADWR") and ADEQ to comply with current construction standards and as a requirement of the well modification permit included in Exhibit FKS-1 along with applicable photos. The well motor was rebuilt and re-installed. Copies of the Company's proposal/contract are included in Exhibit FKS-1. This work was necessary to provide reliable and adequate supplies of water, to provide fire flow capability and to comply with safe drinking water standards. In accordance with ADEQ's Bulletin 10, a minimum of two sources of supply are required for all water systems. If this well were not repaired and returned to service, another well would have been required to be drilled at an estimated cost of $1.25 million based on the cost of the last Company constructed well as shown in Exhibit FKS-2. Installation of a new well liner and pumping equipment at a cost of approximately $125,000 was more cost-effective than drilling a new well. This work was completed and placed in service on April 27, 2010.

<u>Pinal Valley – Coolidge Airport Booster Station (WA 1-4706)</u> – The existing water system has no storage. The Coolidge Airport Water System consists of two wells producing 350 Gallons Per Minute ("gpm") each and a single hydropneumatic tank. The wells are controlled by system pressure and pump directly into the distribution system. The system has a peak domestic demand of 25 gpm and a 350 gpm fire flow requirement. Because the wells have a production capacity significantly larger than peak domestic demand, there were large fluctuations in system pressure from 35 pounds per square inch ("psi") to 75 psi, short cycling of

the well, sometimes cycling every 15-30 minutes and reduced life span of the well pumps. In order to address these issues a booster station and ground storage tank were installed. The new booster station consists of two 2 horsepower pumps and two 40 horsepower pumps. Two 2 horsepower pumps were sized to meet domestic demands while increasing electrical efficiency and stabilizing system pressures as shown in the design report and electrical plans included in Exhibit FKS-1. Each 40 horsepower pump is sized to meet fire flow requirement, increasing system reliability and the second pump provides redundancy. Lack of a booster station and ground storage tank caused system inefficiency by repeated cycling of the larger 50 horsepower well pumps, pressure fluctuations that contributed to leaks and additional water loss, due to water main breaks as shown in Exhibit FKS-1. Specifically, the Company repaired Coolidge Airport water main sixteen times in 2010. Coolidge Airport well pumps 1 and 2 were most recently replaced on April 27, 2010 and August 31, 2010 more often than most well pumps which typically can last 5-7 years or more. The cost of the resulting inefficiency, water loss and pump failures made the booster pump station and ground storage tank installation a cost-effective long-term solution as clearly depicted by the historic well pump replacements and water main repair history. As shown in Exhibit FKS-1, the new storage tank was sized to provide enough storage to reduce well cycle frequency and the booster pumps were sized to meet system demands while also improving the existing fire flow capacity of the two combined wells. This project, coupled with the waterline replacement project noted below, significantly increased and stabilized the system flows, and corresponding water system pressures, effectively handles varying water demands, and provided the required redundancy, safety and reliability to this portion of the water system. This work was completed and placed in service on December 30, 2010.

Pinal Valley – Well No. 21 Pump Replacement (WA 1-4722) – The production capacity of this well dropped off significantly from 580 gpm to 240 gpm within two days. Upon removal of the pump by the contractor, Company engineers determined that the impellers and bowl assembly were worn beyond repair. Additionally, several sections of column pipe were split, with holes in various sections and the well screening showed significant signs of plugging based on a completed well video inspection included in Exhibit FKS-1. The well casing was cleaned, portions of column pipe were replaced, and a new pump assembly was installed. Copies of the Company's proposal/contract are included in Exhibit FKS-1. Company engineers also determined that the well was producing sand and a sand separator was installed to reduce sand production. Production capacity, critical to meeting supply needs, has been restored with these replacements without service interruption. Well production capacity has been restored to 680 gpm. This work was completed and placed in service on June 21, 2010.

Pinal Valley – Well No. 10 Pump Replacement (WA 1-4730) – Well production capacity dropped off abruptly in early 2010 from 900 gpm to 200 gpm over three days. Upon the removal of the pump by the contractor, Company engineers determined that the impellers and bowl assembly were worn and needed to be replaced. Additionally, the well screening showed significant signs of plugging based on a completed well video inspection as shown in Exhibit FKS-1. The well was cleaned and a new pump assembly was installed along with a new sand separator. Copies of the Company's proposal/contract are included in Exhibit FKS-1. This well is critical to meeting peak system demands because Well No. 10 provides approximately twenty percent of the total supply for the Coolidge water system. Not repairing the pumping equipment would have significantly impacted system reliability and the Company's ability to provide reliable and adequate water service as depicted in Exhibit FKS-4. Accordingly it was critical to maintain this existing supply, which represents a significant cost savings in lieu of acquisition and development of new sources of supply for the Coolidge distribution system at a cost exceeding $1.25 million based on the construction cost of the most recent Company constructed well included as Exhibit FKS-2. Critical production capacity was restored to adequately and reliably supply the water demands of the community without service interruption. Well production capacity has been restored to 1430 gpm. This work was completed and placed in service on June 15, 2010.

Pinal Valley – Coolidge Airport Well No. 2 Pump Replacement (WA 1-4754) – Production of this well dropped off significantly over recent years from 380 gpm to 70 gpm over five days. Upon the removal of the well pump by the contractor, Company engineers determined that the impellers and bowl assembly were worn. Additionally, several sections of column pipe were split, various sections of column pipe had holes, and after completing a well video inspection, the well screen showed significant signs of plugging. Photos of the column pipe and a summary of the well video inspection are included in Exhibit FKS-1. The well was cleaned, portions of column pipe were replaced and a new pump assembly was installed. In accordance with ADEQ Bulletin 10, a minimum of two sources of supply are required for all water systems. If this well were not repaired and returned to service another well would have been required to be drilled at an estimated cost of $1.25 million based on the construction cost of the most recent Company constructed well as included in Exhibit FKS-2. Therefore, it was more cost effective to install new pumping equipment at a cost of approximately $25,000 than to drill a new well. Production capacity, critical to this water system, has been restored to adequately and reliably supply the water demands of the community without service interruption. Well production capacity has been restored to 320 gpm. This work was completed and placed in service on August 31, 2010.

Pinal Valley – Well No. 27 Pump Replacement (WA 1-4763) – Shortly after the completion of the storage tank and booster station project listed above, the production of Well No. 27 dropped off rapidly from 450 gpm to 125 gpm in four days. Upon the removal of the well pump by the contractor, it was determined by Company engineers that the impellers and bowl assembly were worn beyond use. Additionally, the well screening showed significant signs of plugging based on a completed well video inspection. A summary of the results is included in Exhibit FKS-1. The well was cleaned and a new pump assembly was installed. As described in WA 1-4620 above, this portion of the system operated at higher pressures, and the well pump was custom constructed with a double bolted ductile iron bowl assembly to address the higher system pressures. This well is critical to meeting peak system demands. Well No. 27 is the only well located in the upper zone in the PVWS and represents approximately twenty percent of the total supply to this zone. As a result of this project, production capacity has been restored to meet critical water demands of the community without service interruption. Well production capacity has been restored to 480 gpm. This work was completed and placed in service on December 20, 2010.

Pinal Valley – Waterline Crossing of Pima Maricopa Irrigation Project Canal (WA 1-4766) – As part of the Pima Maricopa Irrigation Project (PMIP), the Vah Ki Inn Road-Pima Lateral Bridge was required to be replaced. The Company's 6-inch waterline was originally constructed on the side of the bridge under a permit from San Carlos Conservation Project ("SCIP") (the bridge owner). Because of the bridge replacement, SCIP requested the Company to relocate this waterline under the terms of its permit. Timely replacement was required to ensure reliable and adequate water service to those customers on the north side of the bridge as this water main is required to meet the area's peak day demands. In accordance with the Company's PVWS Master Plan included in Exhibit FKS-1, the Company replaced the 6-inch waterline with a 12-inch waterline on the side of the new bridge. This project will be completed and placed in service on or about December 30, 2010.

Pinal Valley – Arizona City Transmission and Distribution Waterline Improvements (WA 1-4774) – The Arizona City Distribution System is interconnected with the PVWS through a single 12-inch transmission line. The transmission line is approximately five miles long starting at the Tanger Booster Station in Casa Grande and ending at the intersection of Battaglia Road and Lamb Road at the northern boundary of the Arizona City Distribution System as shown in Exhibit FKS-1. Well No. 28, the only well source located in the Arizona City portion of the PVWS, is also located at this intersection on the northwest corner. The Company recently installed approximately 2,470 LF of 12-inch Ductile Iron Pipe ("DIP") and 1,500 LF of 16-inch DIP on Lamb Road from Battaglia Road south to Heather Road and on Heather Road from Lamb Road to just east of Kashmir Road. Construction plans, the Company's proposal/contract and Pinal county public works approval is included in Exhibit FKS-1. These waterline improvements were necessary to better distribute the water from Well No. 28, the 5-mile long transmission line from the Tanger Booster Station in Casa Grande and improve flow throughout the system in accordance with the WaterCAD Hydraulic model included in Appendix 9.4 in Exhibit FKS-10. These improvements will also provide more stable system pressures during peak system demand and increase pumping efficiencies by reducing the head pressure on the Well No. 28 and Tanger Booster Station. This work will be completed and placed in service on or about January 28, 2011.

B. White Tank:

White Tank – Install New Electrical Service Entrance Section (SES) Monte Vista Site (WA 1-4621) – This project replaced and upgraded the electrical SES and Motor Control Center or MCC which provides power to the Monte Vista plant site. The site consists of two wells, a booster pump station, an arsenic treatment plant and other related ancillary water facilities and equipment. The SES is where the main power comes in from the electrical provider and where the meter, main fuses and main disconnect are located. It is also where the power utility's facilities end and the Company's facilities begin. The Motor Control Center contains the pump disconnects, starters, radio and all electrical controls for the booster and well pumps. This site supplies 100 percent of the available production capacity to the White Tank upper zone portion of the water system. Maintaining the reliability of this site is critical to providing uninterrupted service. Additionally, a third booster pump was required to meet current system demands and provide required redundancy. The SES was over 25 years old and service parts were no longer available. The SES also did not comply with the current National Electric Code. Not replacing the SES would result in significant interruptions in service because of a failure of the power supply to the electrical equipment or booster pump. The addition of the third booster pump and new SES has allowed for full use of all four wells in the system. The SES and booster pump station improvements were completed and placed in service on December 20, 2010.

White Tank – Well No. 2 Rehabilitation (WA 1-4682) – In late 2009, the pump and motor failed at Well No. 2. After the contractor removed the pump and completed a video inspection of the well, Company engineers determined that the well casing, which was more than 50 years old (originally installed prior to

1950), had deteriorated and was on the verge of collapse. Photos of the casing are included in Exhibit FKS-1. The well was cleaned and a new well liner was installed in the upper portion of the well where the extensive corrosion was present. Additionally, a concrete well sanitary seal was installed as required by ADWR and ADEQ to comply with current construction standards and as a requirement of the well modification permit included in Exhibit FKS-1. Additionally, a new well motor and pump assembly were installed. This well is critical to meeting peak system demands because Well No. 2 is located in the upper zone of the service area and represents approximately fifteen percent of the upper zone water system's source of supply. Not replacing the pumping equipment would have significantly adverse effects on water system reliability, resulting in water shortages because of additional well failures as shown in the production vs. supply analysis included in Exhibit FKS-1. Therefore, the Company determined that replacing the pumping equipment at a cost of approximately $65,000 was more cost-effective than drilling a new well at an estimated cost of $1.0 million based on the cost of the last Company constructed well as shown in Exhibit FKS-2. Without this critical production capacity, ongoing service interruptions would have prevented the Company from adequately fulfilling the water demands of the community. This work was completed and placed in service on March 1, 2010.

White Tank – Well No. 4 Pump Replacement (WA 1-4735) – Production capacity in this well had dropped off significantly from 470 gpm to 120 gpm in a few days. Upon the removal of the pump by the contractor, Company engineers determined that the impellers and pump assembly were worn. Photos showing the worn impellers and bowl assembly are included in Exhibit FKS-1. A new pump assembly was installed and critical production capacity was restored. The Company replaced the well pump to provide reliable and adequate water service critical to the White Tank system operations as shown in the production vs. supply analysis included in Exhibit FKS-1. Without this production capacity, ongoing service interruptions would have prevented the Company from adequately fulfilling the water demands of the community. This well is critical to meeting peak system demands because Well No. 4 is located in the upper zone of the service area and provides approximately thirty-five percent of the upper zone water system's source of supply. Failing to repair this pumping equipment would have significant adverse effects on water system reliability, resulting in water shortages because of additional well failures. When compared to drilling a new well at an estimated cost of $1.0 million (as shown in Exhibit FKS-2), replacing the pumping equipment at a cost of approximately $15,000 was the most cost effective solution. This work was completed and placed in service on April 9, 2010.

<u>White Tank – Well No. 7 Asphalt Driveway (WA 1-4737)</u> – As a requirement of the building permit for the construction of the nitrate treatment plant at White Tank Well No. 7, Maricopa County required the Company to submit a one-year status report update to Maricopa County. During its review of the status report, the County identified an oversight in its original building permit review, and required the Company to revise the onsite grading and drainage and to install a new paved driveway from McDowell Road to the north entry gate to the site. A copy of this requirement is included in Exhibit FKS-1. This required work was completed and placed in service on December 15, 2010.

C. <u>Phoenix Office:</u>

<u>Phoenix Office – Replace Cooling System and Air Handler (WA 1-4522)</u> – The cooling system for the Phoenix Corporate Office was installed in 1989 and suffered frequent and costly outages totaling 11 different instances between the years of 2006 and 2007.

PHOENIX OFFICE COOLING SYSTEM FAILURES AND OUTAGES 2006-2007	
2006	2007
April 04, 2006	June 29, 2007
July 19, 2006	August 07, 2007
October 05, 2006	August 10, 2007
	August 19, 2007
	September 12, 2007
	September 13, 2007
	September 24, 2007
	October 03, 2007

These outages included circulating pump and motor failures, circuit and fuse failures, and coolant discharges. These frequent outages, coupled with the limited availability of replacement parts due to its age and inefficient cooling, justified replacement of the cooling system.

The Company's Heating, Ventilating, and Air Conditioning ("HVAC") vendor completed a Chiller Operational Analysis which is included in Exhibit FKS-1. This completed analysis compared the operating, installation, and electrical costs of our new replacement cooling systems versus the existing cooling system in order to select the most suitable and cost-effective replacement. A replacement cooling system was selected from the four systems analyzed, and an agreement was reached with the Company's HVAC vendor to coordinate this replacement. Replacement of the cooling system was completed on March 2, 2010.

IV. Description of Company-Funded Construction Budgeting Procedures

Q. HOW DOES THE COMPANY DETERMINE WHICH PROJECTS TO FUND IN A GIVEN BUDGET YEAR AND WHAT PROCEDURE DOES THE COMPANY

USE TO IDENTIFY A COMPANY-FUNDED UTILITY PLANT CONSTRUCTION PROJECT?

A. Each year, the Company prepares a detailed construction budget for each of its eleven consolidated water systems for the upcoming year. The budgeting process begins with each Division Manager preparing a proposed construction budget for utility plant additions in the water systems they manage. Within the proposed construction budget, each Division Manager identifies the water facilities needed to improve or maintain service to existing customers, based on their management experience and personal knowledge of the water system. For example, Division Managers propose construction projects such as storage tanks, replacement of or increases in capacity of booster pump stations, new wells or replacement of water mains or transmission lines. These recommendations are made to ensure safe, reliable and adequate water service.

The proposed construction projects are then reviewed and analyzed by the Company's engineering staff, who further research and evaluate the need for each project. Data supporting each project is collected and the engineering staff develops preliminary schematics and cost estimates. Engineering staff also review current and projected water system demands and evaluate production, pumping and storage capacities available to meet such demands. Additional factors reviewed and analyzed include compliance, trends in source water quality and changes in regulations that may affect continued compliance with drinking water standards.

Several days are set aside each year for Division Managers, engineering staff, operations staff and senior management to meet at each Division office to collectively review and discuss each proposed construction project. A field visit is subsequently conducted to review and discuss the larger scale construction projects. The proposed projects are then prioritized by the Company's officers, and a final construction budget is prepared and presented to the Company's Board of Directors for review and approval.

Q. WHO DETERMINES HOW MUCH WILL BE ALLOCATED AND APPROVED FOR COMPANY-FUNDED PROJECTS?

A. The Company's Board of Directors establishes the dollar amount of the annual construction budget. Under normal circumstances, the construction budget would increase each year to reflect increasing costs of construction due to increases in the costs of materials and labor, general inflation and additional regulatory requirements. Since the end of 2007, however, the Company's construction budget has been significantly reduced due to the Company's worsening financial condition. For example, the Company's 2008 capital budget was reduced from $18.9 million to $8.1 million. Additional reductions for the next two budget years were required and authorized by the Company's Board of Directors, further reducing the Company's 2009 and 2010 capital budgets to $5.0 million and $6.6 million, respectively.

The approved 2011 construction budget will be in the same reduced range as those of the last few years due to the Company's financial condition. The Company is no longer able to issue additional long-term debt, because it is not able to generate sufficient earnings to meet the interest coverage ratio required by its General Mortgage Bond Indenture.

Q. HOW DO YOU IMPLEMENT THE COMPANY'S CONSTRUCTION BUDGET?

A. Upon Board of Directors approval of the Company's construction budget, the Company's Engineering department prepares detailed construction plans for the planned additions to utility plant and obtains the required regulatory permits and approvals. Once the required approvals have been obtained, the Engineering department releases the project to construction. Major water infrastructure, such as booster pump stations, storage tanks and new wells, are competitively bid by the Company's Engineering department. For pipeline projects, the Division Managers solicit competitive bids from a list of qualified independent contractors. All other factors being equal, these projects are awarded to the qualified contractors submitting the lowest bids.

Q. DOES THE COMPANY FUND ALL INFRASTRUCTURE NEEDED TO SERVE NEW DEVELOPMENTS?

A. No. The Company's annual construction budget is limited to projects funded by the Company. Developers' infrastructure requirements are funded by the developers as their projects proceed.

Q. ARE DEVELOPER ADVANCED FUNDS FOR WATER FACILITIES INCLUDED IN THE COMPANY'S ANNUAL CAPITAL BUDGET?

A. No.

Q. HOW ARE DEVELOPERS' WATER FACILITY REQUIREMENTS DETERMINED AND BUDGETED?

A. The Company works with developers to determine the water facilities required to serve their developments. Such facilities include waterlines, fire hydrants, water services and water meters. However, for larger developments, the facilities required may also include storage tanks, booster pump stations, wells and water treatment. The facilities required are included in main extension agreements between the Company and developer. The developers fund these infrastructure requirements, and the project timing is entirely dependent on their development schedule. Since the Company does not fund these infrastructure requirements, it does not include developer advances or contributions within its annual capital budget.

Q. WHAT IS THE BREAKDOWN OF COMPANY-FUNDED INFRASTRUCTURE VERSUS DEVELOPER-FUNDED UTILITY PLANT ADDED SINCE THE LAST RATE APPLICATION THAT INCLUDED THE WESTERN GROUP?

A. The breakdown of Company-funded versus developer-funded infrastructure follows the growth characteristics of each water system. With the ongoing recession, the amount of developer-funded infrastructure has dropped sharply with the cessation of building in the Western Group. With the Company's deteriorated earnings, Company-funded utility plant additions have also decreased. In the Western Group, developers funded 58.6 percent of the total utility plant added between January 2008 and December 2009.

V. Description of Company-Funded Utility Plant Additions For The Western Group

Q. PLEASE SUMMARIZE THE COMPANY-FUNDED UTILITY PLANT ADDED TO THE WESTERN GROUP SINCE DECEMBER 31, 2007.

A. From the beginning of 2008 through the end of the first quarter of 2011, the Company annually funded construction projects for each Western Group system to maintain or replace infrastructure, resolve operational problems, address safety concerns, comply with Safe Drinking Water Act requirements and make the utility plant additions necessary to maintain safe, reliable and adequate water service to its customers. A summary of the cost of these improvements follows:

ARIZONA WATER COMPANY Western Group Company-Funded Utility Plant Made From 2008 to 2009[1]		
Ajo	**PVWS**	**White Tank**
$79,682	$9,371,886	$2,132,710

[1] Excludes post-Test Year plant additions, which were approved as part of Docket No. W-01445A-08-0440 and includes post-Test Year plant additions sought in this Rate Case Application.

The cost of the utility plant additions for the three water systems in the Western Group represent infrastructure needed to maintain reliable and adequate water service. Due to the Company's adverse financial condition, utility plant additions budgeted in 2008, 2009 and 2010 did not include all plant identified by the Company's Division Managers or Engineering staff as being necessary. To improve this situation, the Company is proposing to continue the ACRM for its Western Group, establish an Off-site Facilities Fee and adopt a Distribution System Improvement Charge ("DSIC"). Mr. Harris and Mr. Garfield address the specific details of these proposals in their direct testimony.

The following table summarizes the length of water mains by pipe diameter added to each system since the last rate case.

Linear Feet Of Water Pipelines Added From 1-1-2008 thru First Quarter 2011			
Water Main Diameter	**Ajo**	**PVWS**	**White Tank**
6-inch	1,171	6,447	2,711
8-inch	N/A	2,120	N/A
12-inch	N/A	13,210	2,007
16-inch	N/A	2,352	5,807
24-inch	N/A	372	N/A

A. <u>Ajo:</u>

In Ajo, capital expenditures remained stable, but lower than optimum. The Company completed water main replacements and tie-ins to improve service, system pressure and system reliability. This replacement project was completed in late 2008. The remaining capital investments consisted of replacement of service lines and main line valves and other miscellaneous items.

B. <u>Pinal Valley:</u>

The PVWS experienced a rate of growth in 2008 and 2009 that was significantly slower than during the previous rate case period. Notable Company-funded capital improvements included the design and construction of eight (8) underground pipe sleeved waterline replacements under the Union Pacific railroad tracks. These replacements were required due to the addition of a second railroad track constructed adjacent to the existing track. The Company also completed the first two phases of the Pinal Valley SCADA project. The third phase is discussed in Section III of this testimony as necessary post-Test Year plant additions.

The first phases focused on:

1. Detailed design and programming.
2. Purchase and installation of SCADA computers, software and physical hardware at control centers located in the Casa Grande and Coolidge areas.
3. Installation of a water treatment plant control system at the nitrate treatment plant located at Coolidge Wells No. 9 and No. 10.
4. Installation of a pump and tank level control system at the Coolidge elevated storage tank, booster station and at Coolidge Well No. 7.
5. Construction of the Burgess Peak Tank controls and primary repeater, which is the primary control for two centralized arsenic water treatment plants' production and serves as a repeater site for communication for all Pinal Valley water treatment, production and storage facilities.
6. Installation of a secondary repeater at Casa Grande Well No. 27 to relay data from the easternmost portion of the PVWS to the central SCADA system in Casa Grande.

In addition to the above, the Company replaced several large well pumps and motors, rehabilitated one well, replaced booster pumps, motors, and chemical pumps and installed miscellaneous new electrical controls and a power supply to a critical well. The Company also constructed waterline and service line replacements, waterline tie-ins to loop waterlines to improve pressure and reliability.

C. **<u>White Tank:</u>**

The White Tank system continued to experience slow growth in 2008 and 2009. Capital improvements included the design and construction of a transmission pipeline critically needed to adequately transport water across the water system. Additionally, the transmission line improves operational efficiencies in the lower zone, significantly improving flow capacities.

Other White Tank system improvements include replacement of well pump motors, rehabilitation of a well, booster pump station upgrades and pump replacements, installation of new electrical controls and power supply to a critical water treatment plant and pumping facility, and waterline replacements. At the existing nitrate treatment plant, additional pre-treatment filtration (bag filters) were installed to increase system reliability by removing particulate matter prior to water treatment, thereby reducing the potential for treatment plant disruptions and maintenance impacts. A nitrate analyzer was also installed in compliance with a Maricopa County Environmental Services approved blend plan to ensure the safety of all water produced by the system.

VI. <u>Proposed Arsenic Treatment Plant Additions</u>

Q. DOES THE COMPANY NEED TO CONSTRUCT ADDITIONAL ARSENIC TREATMENT PLANTS IN THE WESTERN GROUP?

A. Yes. Because of increasing arsenic levels in the Company's PVWS wells, the Company plans to expand the treatment capacity of the existing Henness Road arsenic treatment plant. In addition, a new arsenic treatment plant for Coolidge Well No. 13 must be constructed in the PVWS because of sharply rising arsenic levels that do not comply with the MCL as shown in Exhibit FKS-4. Construction of these arsenic treatment plants is required for the Company to comply with the federally mandated safe drinking water standards for arsenic. The Company is proposing to recover the cost of compliance with stringent new arsenic standards through the continuation of the Arsenic Cost Recovery Mechanism ("ACRM"), as addressed in Mr. Garfield's and Mr. Harris' testimony.

In Decision No. 71845, the Commission authorized continuation of the ACRM in the Company's Sedona and Superstition water systems. Mr. Harris also discusses continuation of the ACRM in his direct testimony in Section IV.

Q. WHY IS THE COMPANY PLANNING TO EXPAND THE TREATMENT CAPACITY OF THE HENNESS ROAD ARSENIC TREATMENT PLANT?

A. The Company needs to expand this treatment plant to make full use of existing wells that require arsenic treatment due to rising arsenic levels that do not comply with the MCL.

The Cottonwood Lane arsenic treatment plant is at full capacity and cannot treat all source capacity currently pumped to this arsenic treatment plant. In addition, the Cottonwood Lane site is too small to accommodate expansion. The Company anticipated future expansion needs at the Henness Road arsenic treatment plant and its design was based on a modular expandable plant design. The Henness Road arsenic treatment plant site is sufficiently sized to accommodate two additional vessels, increasing the arsenic treatment plant capacity by 1,350 gpm, enough capacity to treat Well No. 25. Well No. 25 now pumps primarily to the Cottonwood Lane arsenic treatment plant, but under the Company's proposed expansion of the Henness Road arsenic treatment plant, water from Well No. 25 (approximately 1,230 gpm) will be pumped to the

Henness Road arsenic treatment plant. This expansion will treat all incoming source capacity to comply with the arsenic safe drinking water standard. The total capacity of the Henness Road arsenic treatment plant will be expanded from 4,050 gpm to 5,400 gpm.

Currently, the Cottonwood Lane arsenic treatment plant accounts for 34 percent of the total water supply to the Casa Grande area of the PVWS. After the reallocation and expansion, the percent of supply for the Cottonwood Lane and Henness Road arsenic treatment plants will be 34 percent and 31 percent, respectively. As noted, the reallocation of these sources and expansion of this plant will also allow full use of those arsenic-contaminated wells within the system and postpone the need for additional supplies for this area.

CURRENT WELL CAPACITY AND HIGHEST RECORDED ARSENIC LEVELS		
WELL NO.	FLOW (GPM)	ARSENIC LEVEL (PPB)
10	910	11
14	170	10.5
17	750	13
19	1530	13.6
21	750	12
23	1400	17.2
24	930	15
25	1150	16
26	1340	50
30	730	30
31	1100	63

The existing arsenic treatment process, coagulation/filtration, will also be used for this expansion. The schedule for the expansion is as follows:

ACTIVITY	DURATION
Design and Permitting	8 months beginning January 1, 2012
Bidding	30 days
Procurement	5 months
Construction	8 months with a completion date of June 1, 2014

The preliminary cost estimate for the Henness Road arsenic treatment plant expansion is $900,000.

Q. WHY IS THE COMPANY PLANNING TO CONSTRUCT A NEW ARSENIC TREATMENT PLANT AT COOLIDGE WELL NO. 13?

A. Construction of an arsenic treatment plant at Coolidge Well No. 13 is needed to comply with the federally mandated arsenic MCL and to provide the necessary supply to ensure adequate service during peak system demands. When this well was originally drilled and placed in service in 2006, the arsenic levels were approximately 6 parts per billion ("ppb") which is below the new arsenic MCL of 10 ppb. The well has been in service reliably since that date, but water sampling results now show arsenic levels at or above the 10 ppb MCL as depicted in Exhibit FKS-4. The well cannot be used until a new arsenic treatment plant is completed. A system analysis, included in Exhibit FKS-3, shows a shortage of approximately 380,000 gallons per day ("GPD") when Coolidge Well No. 13 cannot be used. Therefore, Coolidge Well No. 13 is a critically needed source of supply, and is required to maintain safe, reliable and adequate water service in this area.

Q. WHAT IS THE CURRENT STATUS OF THIS ADDITIONAL ARSENIC TREATMENT PLANT?

A. The Company is evaluating arsenic treatment process alternatives to determine the best available treatment technology and cost-effective arsenic treatment process to construct at Coolidge Well No. 13. Once this process is completed, the Company will prepare the site plan and use permit for City of Coolidge approval. Once this approval is received in 2011, the Company will proceed with detailed design drawings followed by project bidding and construction, which is anticipated to be completed by summer of 2012. The preliminary cost estimate for the Coolidge Well No. 13 arsenic treatment plant is $1,750,000.

VII. Transmission and Distribution System Maintenance

Q. ARE EFFORTS TO REDUCE WATER LOSS LIMITED TO CAPITAL EXPENDITURES ASSOCIATED WITH REPLACING AGING INFRASTRUCTURE?

A. No. A significant amount of the Company's effort to reduce water loss is focused on maintenance of its transmission and distribution ("T&D") systems. The Company incurs a significant amount of operating expenses to maintain its T&D systems and repair main breaks and service leaks. Between January 2008 and December 2010, the Company repaired over 800 leaks or more than one leak repaired each workday as shown in the table below.

Water Main and Service Line Leaks	
YEAR	**LEAKS REPAIRED**
2008	275
2009	256
2010	271

Q. HAS THE COMPANY BEEN ABLE TO MAINTAIN ITS NORMAL LEVEL OF TRANSMISSION AND DISTRIBUTION SYSTEM MAINTENANCE WITH THE CURRENT ECONOMIC CONDITIONS AND DETERIORATING EARNINGS?

A. No. As explained by Mr. Harris in his direct testimony in Section II, the Company implemented a number of significant, but temporary, cost-cutting measures in response to the economic downturn beginning in 2008, including a focused reduction in the level of costs devoted to the maintenance of the Company's T&D systems within minimum levels sufficient to maintain adequate and reliable service. As discussed in Mr. Reiker's direct testimony in Section VI, the Company succeeded in reducing T&D maintenance expenses by over $380,000, or 11.3 percent from 2007 levels. However, a consequence of the Company's cost cutting measures was a further (though hopefully temporary) limitation in the Company's ability to adequately respond to and reduce water loss.

Q. CAN THE COMPANY CONTINUE TO REDUCE WATER LOSS AND MAINTAIN ITS T&D SYSTEMS EFFECTIVELY WITHOUT INCREASING THE AMOUNT EXPENDED ON THESE EFFORTS?

A. No. Short term (1-3 years) reductions in T&D maintenance cannot be continued. The continued reduction and deferral of T&D maintenance (and associated expenses) will lead to long-term maintenance problems. It is vital that, besides replacing old failing water lines, the Company also increase the amount spent maintaining its T&D to normal levels in the near future so it can prolong the useful lives of such infrastructure and continue to reduce water loss. Again, these cost-cutting measures were seen as short term and were not envisioned as long-term reductions.

Q. HOW WILL THE COMPANY BE ABLE TO REDUCE WATER LOSS IF T&D EXPENSES WERE REDUCED TO ABNORMALLY LOW LEVELS THROUGH COST-CUTTING MEASURES IN 2008?

A. By increasing T&D expenses to normal expense levels through pro forma adjustments. See Reiker Direct Testimony, pages 19-20.

Q. WILL THE COMPANY BE ABLE TO COMPLY WITH THE COMMISSION'S DIRECTIVE TO REDUCE WATER LOSS TO LESS THAN TEN PERCENT FOR ALL OF ITS SYSTEMS WITHOUT INCURRING ADDITIONAL T&D EXPENSES?

A. No, since a critical aspect of the Company's efforts to reduce water loss includes locating and repairing water main and service line leaks and breaks, all of which are maintenance expenses and not capital expenditures.

Q. WILL THE COMPANY BE BETTER POSITIONED TO COMPLY WITH THE COMMISSION'S WATER LOSS REDUCTION DIRECTIVE IF THESE ADJUSTMENTS ARE APPROVED?

A. Yes.

VIII. Off-Site Facilities Fee

Q. WHAT IS THE AMOUNT OF THE COMPANY'S PROPOSED OFF-SITE FACILITIES FEE?

A. As discussed in Mr. Harris' direct testimony in Section VII, the proposed Off-Site Facilities Fee tariff is $3,500 for each new service connection with a 5/8 x 3/4-inch meter, and the amount of the Facilities Fee increases for larger meter sizes. The proposed Off-Site Facilities Fee tariff is included in Mr. Harris' direct testimony as Exhibit JDH-10.

Q. WHAT FACILITIES DOES THE COMPANY PROPOSE TO FUND WITH THIS FACILITIES FEE?

A. The Company intends to apply Facilities Fee's to fund major regional water supply and treatment facilities needed to meet the water supply requirements of the growing customer base the Company expects in the future. The facilities are primarily the Pinal Valley Regional surface water treatment plant ("Pinal Valley CAP Treatment Plant") and the necessary transmission and distribution mains, storage tanks and booster stations needed to treat, store, pump and ultimately provide safe, reliable and adequate water service and to transition to sustainable supplies. Sustainable supplies are needed to meet the needs of increased customers projected in the future in this area. The preliminary estimated cost to design and construct the Pinal Valley CAP Treatment Plant and all related infrastructure facilities is approximately $81.8 million, as detailed in Exhibit FKS-5.

The phasing of the proposed infrastructure related to the Off-Site Facilities Fee is depicted in Exhibit FKS-6. The total project is expected to be constructed in phases over a 20-year time frame, as described in Exhibits FKS-6 and FKS-7.

Q. PLEASE DESCRIBE THE PINAL VALLEY CAP TREATMENT PLANT.

A. The Pinal Valley CAP Treatment Plant is a surface water treatment plant being planned and designed to provide a renewable water source of supply for the Company's Pinal Valley service area. The PVWS has a combined annual CAP allocation of 10,884 acre-feet, or the equivalent of the need for a potential 10 Million Gallon per Day ("MGD") treatment capacity. Additional available CAP water allocations could be obtained in the future, if needed. A copy of the Pinal Valley CAP Treatment Plant site layout is included as Exhibit FKS-8.

Q. DOES THE CONSTRUCTION OF THE PINAL VALLEY CAP TREATMENT PLANT REQUIRE A SIGNIFICANT INVESTMENT?

A. Yes. However, when complete, facilities will be in place to treat and deliver CAP water and will provide sustainable water benefits to customers in the Company's PVWS. Mr. Harris has provided direct testimony in Section VII, describing the Company's proposed Off-Site Facilities Fee tariff to fund the Pinal Valley CAP Treatment Plant and its related infrastructure.

Q. WHAT BENEFITS ARE ACHIEVED BY BALANCING THE COMPANY-FUNDED INFRASTRUCTURE WITH DEVELOPER-FUNDED INFRASTRUCTURE?

A. The Company's goal is to have developers, not existing customers, pay for the cost of water facilities needed to serve the development. Having developers fund infrastructure results in lower overall cost of service and more gradual rate increases. In addition, the risks related to speculative development are borne by developers and not existing customers.

Q. WHAT WILL THE RATE IMPACT BE FOR EXISTING PVWS CUSTOMERS TO FUND CONSTRUCTION OF THE PINAL VALLEY CAP TREATMENT PLANT?

A. As described in Section VII of Mr. Harris' direct testimony, the Pinal Valley CAP Treatment Plant will be funded from Facilities Fees and not by the Company. Construction of the Pinal Valley CAP Treatment Plant and associated water facilities will be funded by future developers, and customers should not have to pay for these facilities.

Q. WHY DOES THE COMPANY CONSIDER THE PROPOSED PINAL VALLEY CAP TREATMENT PLANT TO BE A REGIONAL PLANT?

A. Because it will be treating the Company's Casa Grande and Coolidge CAP allocations for use within all systems in the Company's entire PVWS, comprising approximately 232 square miles.

Q. HOW MANY CONNECTIONS COULD BE SERVED BY THE PINAL VALLEY CAP TREATMENT PLANT?

A. The Company's Pinal Valley CAP allocations total 10,884 acre-feet. Based on the average residential water usage in the PVWS of 10,244 gallons per month (See Schedule H-2, Page 2 of the Company's application), or 0.38 acre-feet per residential connection per year, the Pinal Valley CAP Treatment Plant will have the capacity to supply approximately 28,650 equivalent residential units or an equivalent population of 85,950. In addition to the Company's existing Pinal Valley CAP allocations, there is the potential to secure contracts for non-Indian agricultural priority CAP water, and to lease CAP supplies from other subcontractors.

Q. IN ADVANCE OF THE CONSTRUCTION, WHAT OTHER STEPS WILL THE COMPANY TAKE TO DESIGN AND PREPARE FOR CONSTRUCTION OF THE PINAL VALLEY CAP TREATMENT PLANT AND RELATED FACILITIES?

A. There are several engineering tasks that must be completed in advance of the construction. These include:

1. Acquiring rights-of-way, permits or easements.

2. Completing additional minor land acquisitions.

3. Submitting construction drawings for the Pinal Valley CAP Treatment Plant to the U.S. Department of the Interior's Bureau of Reclamation (the "BOR") for environmental approvals.

4. Obtaining a Pinal County Conditional Use Permit, as the land is currently zoned for agricultural use; and

5. Coordinating with the local power company to bring power to the Pinal Valley CAP Treatment Plant, its associated booster pump stations, wells and to establish telecommunication, sewer and other utility or supporting services.

Upon completion of the above-referenced engineering tasks, the Company will be ready to prepare necessary documents to bid the design, which will culminate in the completion of full construction drawings for the Pinal Valley CAP Treatment Plant.

Q. WHAT PROGRESS HAS THE COMPANY MADE TO DATE IN PREPARING FOR THE PINAL VALLEY CAP TREATMENT PLANT CONSTRUCTION?

A. In 2001, the Company started planning the Pinal Valley CAP Treatment Plant in central Pinal County by identifying and purchasing the Real Property near Coolidge, in close proximity to the CAP canal.

In 2006, the Company solicited proposals from and interviewed Arizona's most qualified surface water treatment design and construction consultants. Through this competitive process, Carollo Engineers was selected to proceed with a comprehensive Utilization Plan and Conceptual Design report for the Pinal Valley CAP Treatment Plant.

On March 30, 2005 the Company submitted its application to the Arizona State Land Department ("ASLD") for right-of-way access to cross state land from the CAP canal to the proposed Pinal Valley CAP Treatment Plant site. The lease for the right-of-way was approved by the ASLD, and the lease agreement between the ASLD and the Company was executed on December 11, 2009.

Q. WHEN DOES THE COMPANY EXPECT TO COMMENCE CONSTRUCTION OF THE PROPOSED PINAL VALLEY CAP TREATMENT PLANT AND ASSOCIATED FACILITIES?

A. The construction of the Pinal Valley CAP Treatment Plant and related infrastructure facilities will commence once sufficient funds are raised through the proposed Facilities Fee. Collection of the required funds is dependent on customer growth in the PVWS. Exhibit FKS-6 and FKS-7 depicts the construction schedule anticipated for this important water facility based on current growth projections.

IX. <u>Reducing Water Losses – Current Program</u>

Q. HOW DOES THE COMPANY MEASURE AND REPORT WATER LOSSES?

A. The Company calculates and reports water loss in accordance with ADWR requirements, specifically in accordance with ADWRs Third Management Plan for the three Active Management Areas ("AMA") where the Company's water systems are located (Phoenix, Pinal and Tucson). Each Active Management Area Management Plan for 2000-2010 defines water loss and establishes the methods for calculating its percentage. For the Company's water systems not covered by one of the three AMAs, the same methodologies are followed.

For the Third Management Plan period, ADWR allows water providers to exclude certain non-revenue water used for specific purposes from the water loss calculation. Those allowed non-revenue system deliveries are summarized in section 5.7.6.2 of the Third Management Plan titled, "Distribution System

Requirements" and are listed in detail in Appendix 5-M. The Company uses the Third Management Plan water loss calculation methods in accordance with Appendix 5-M. Pertinent excerpts from the ADWR Third Management Plan for the Phoenix AMA are attached as Exhibit FKS-9.

Q. PLEASE DESCRIBE THE COMPANY'S EFFORTS TO REDUCE WATER LOSS IN ITS SYSTEMS, SPECIFICALLY THE WESTERN GROUP WATER SYSTEMS THAT ARE THE SUBJECT OF THIS RATE CASE.

A. Reducing water loss within the Company's 22 ADEQ Public Water Systems ("PWS") is an ongoing and concerted effort by the Company. The 22 public water systems include community and non-community water systems. Water loss for each system is tracked monthly and analyzed by each Division Manager. Division Managers direct employees to monitor, locate and repair leaks using the Company's leak detection equipment, and track and record those efforts each month. The Company's upper management reviews monthly reports from the Division Managers that detail their activities in repairing leaks and monitoring for undetected leaks. This information is closely monitored and carefully scrutinized to ensure that water loss is kept to a cost-effective minimum. The efforts in the Western Group water systems are no exception.

Q. WHAT DO YOU MEAN BY "COST-EFFECTIVE MINIMUM"?

A. By "cost-effective minimum", I am referring to the level of system water loss that normally occurs as part of water system operations without: (1) having to divert capital resources from projects that are more urgent and necessary to ensure the provision of reliable and adequate service and (2) requiring a level of investment that would be unduly burdensome on the Company's very limited capital budget and on customers' rates, as explained in more detail by Mr. Harris in his direct testimony.

Q. YOU ALSO MENTIONED THAT THE COMPANY USES LEAK DETECTION EQUIPMENT. IS THIS EQUIPMENT USED IN THE WESTERN GROUP WATER SYSTEMS?

A. Yes. To provide for a more effective ongoing leak detection program, reducing water loss has been fully integrated into the Company's daily operations. The Company purchased leak detection equipment so its own employees can perform the required leak surveys, as described below.

In 2003, the Company purchased its first digital leak correlator and a data logger for use in locating leaks. Training was provided to a number of the Company's field technicians. Based on the initial success in using this equipment, the Company purchased a second set of leak correlators and data loggers. This equipment is used throughout the Company, and the Company's system operators have become more experienced with the use of these types of equipment. As a result, the Company purchased additional digital leak correlators. Currently, each Division has and routinely uses at least one set of leak correlators. In systems where additional digital leak correlators were needed to adequately maintain its system, the Company authorized the purchase of two units. Currently, the Company owns eight digital leak correlators and three data loggers, which are used throughout the Company's water systems. The third data logger was purchased in 2010 and a fourth data logger is budgeted for purchase in 2011. For a complete description of the Company's leak detection equipment, see Section 5.3 of Exhibit FKS-10.

The Company has achieved some success in reducing water loss due, in large part, to ongoing water loss monitoring and the continued use of these leak detection units. The Company intends to purchase additional digital leak correlators and data loggers in future years as needed.

Q. IS THE COMPANY DOING MORE TO MONITOR AND REDUCE WATER LOSS?

A. Yes. The Company has prepared a comprehensive analysis outlining the historical, current and anticipated future efforts and requirements to effectively reduce water loss in the Company's PVWS. This initial report, titled "Water Loss Reduction Program for the Pinal Valley Service Area," and dated December 29, 2010, is attached to this testimony as Exhibit FKS-10. For Ajo and White Tank, the Company seeks to reduce water loss through similar efforts in the following four categories: 1) water main and service line repair and replacement, 2) use of leak detection equipment to monitor the system for leaks, 3) water meter selection review, and 4) meter repair, maintenance and replacement program.

Q. CAN YOU SUMMARIZE THESE CATEGORIES IN MORE DETAIL?

A. Yes. I will summarize the Company's water loss reduction efforts for each category.

<u>WATER MAIN AND SERVICE LINE MAINTENANCE AND REPLACEMENT PROGRAM</u>

The Company reduces water losses caused by leaks and water main and service line breaks by locating such leaks and breaks and effecting timely repairs and/or replacements. The Company schedules repairs of smaller water main and service line leaks as soon as possible. In the case of main breaks, the Company makes repairs on an emergency basis. Sources of water losses caused by unidentified water main and service line leaks are more problematic, as they are not always easily identified except through more advanced methods of detection, such as through the use of digital leak detection or correlation equipment and by conducting leak surveys. Meter readers report observed service leaks in their normal course of reading meters and enter such information into data entry devices used to generate service repair orders. Meter readers serve an essential role in system monitoring as they operate in every part of each water system each month and report signs of leaks and/or breaks through visual inspection.

LEAK DETECTION

As discussed above, the Company relies upon two complementary types of leak detection equipment in its water systems. This equipment allows the Company to identify the location of water leaks more efficiently than other, more labor intensive methods. One type of leak detection equipment, the data logger, is used to survey a larger area of the distribution systems to locate potential leaks that would not otherwise be located by visual inspection/observation techniques. A second type of leak detection equipment, the digital leak correlator, is used to pinpoint the location of potential leaks on a real-time basis, as well as confirming or validating locations of suspected leaks identified through surveys conducted with the data logger. Other effective "listening" devices are also used throughout the Company's water systems. The Company's system operators are professionally trained in the operation of the digital leak detection equipment, and the use of this type of equipment has proven to be an effective method of locating leaks and reducing water loss.

METER SELECTION REVIEW

The Company's engineering department, using information provided by the Company's meter shop in Coolidge, reviews new meter applications prior to establishing water service. Typically, 5/8 x 3/4-inch water meters are installed for new residential subdivisions. Both residential and non-residential meter applications that require 1-inch or larger water meters result in wide ranges of flows, and some applications may include fire flows. The Company's Engineering department chooses the most appropriate meter for each application that meets the service needs and can accurately measure the quantity of water provided throughout the expected range of customer flows. Different types of water meters have characteristic accuracies through various ranges of flows. Meters are designed to provide a high level of accuracy throughout specific ranges of flows according to AWWA and other water industry standards. Within a specific size of meter, different meter types (i.e., turbo, compound, jet, etc.), have different accuracies over various flow ranges. Simply put, not all meters are the same and each meter has its limitations or specific use.

METER MAINTENANCE PROGRAM

The Company's meter maintenance program establishes the criteria for meter removal, repairs and replacement. Instead of simply replacing a water meter based on its number of years in service, the Company's meter shop has established comprehensive change-out criteria based on total gallons, water quality and length of time in service for each water system. The water quality characteristics of individual water systems can have a significant impact on the service life of a metering device and, as a result, maintenance criteria can vary between systems. Simply repairing or replacing all meters based on years in service without regard to usage and water quality impacts is not an effective and efficient use of capital or maintenance expenditures.

The Company's meter shop performs periodic random tests on each water system's meters to provide an ongoing assessment of the suitability of meter change-out criteria for each system. In this manner, the Company ensures that meter accuracy is maintained within industry standards and is confirmed through meter testing. The Company's water systems are current with their meter maintenance program and ongoing meter testing program.

Q. IS THE COMPANY'S METER REPAIR PROGRAM AN EFFECTIVE AND COMPREHENSIVE PROGRAM?

A. Yes. The Company is a leader in this area, I am not aware of any private water utility in Arizona that manages its meter program as aggressively and efficiently as the Company. Our meter repair and maintenance technicians routinely train other water utilities personnel on such advanced practices at utility conferences. The Company is a leader within the water industry in this regard. The Company's meter shop is able to test meters from 5/8 x 3/4-inch to 12-inch in size with a flow testing range of 0.25 gpm to 1,000 gpm. In fact, other water utilities periodically ask our meter technicians to test their meters to verify meter accuracy.

In addition, the Company's President, Mr. Garfield, serves on AWWA's Water Meter Standards Committee, which establishes water meter accuracy, repair, and other standards for the water industry.

Q. ARE THESE CATEGORIES OF WATER LOSS REDUCTION METHODS TYPICALLY USED BY WATER COMPANIES?

A. Yes. The water main and service line maintenance programs and the use of leak detection equipment are standard water industry practices. However, the Company's Western Group contains water infrastructure that is approaching 90 years old and is showing signs of acute failure. The Company's efforts to cut water loss and eliminate causes of water loss are discussed in more detail in Sections 4 and 5 of the report attached as Exhibit FKS-10.

X. <u>Reducing Water Losses – Distribution System Improvements</u>

Q. DID THE COMMISSION ESTABLISH A WATER LOSS STANDARD IN DECISION NO. 71845?

A. Yes. In Decision No. 71845, page 92 lines 26-28 and page 93, lines 1-8, the Commission ordered:

"That Arizona Water Company shall reduce the non-account water for each of its systems to less than 10 percent by July 1, 2011. For those systems that have not achieved a water loss rate of less than 10 percent by July 1, 2011, AWC should evaluate the systems and prepare a report demonstrating how the Company plans to reduce water losses to less than 10 percent. If the Company contends that reducing water losses to less than 10 percent is not cost effective, it should submit a detailed cost analysis and explanation demonstrating why the water loss reduction to less than 10 percent is not cost effective. Absent extraordinary circumstances, and with compelling supporting documentation, no system should be permitted to maintain non-account water above 15 percent. The water loss report should be filed with Docket Control, as a compliance item in this docket, by no later than December 31, 2011."

Q. HAS THE COMPANY DOCUMENTED AND QUANTIFIED ITS EFFORTS TO REDUCE WATER LOSS IN THE PINAL VALLEY WATER SYSTEM?

A. Yes. The Company has prepared an initial detailed report titled "Water Loss Reduction Program for the Pinal Valley Service Area", attached to this testimony as Exhibit FKS-10, which specifically evaluates water loss in the Company's Pinal Valley water system including the Coolidge Airport water system. Section 5.0 of Exhibit FKS-10 details the Company's historic and ongoing efforts to reduce water loss, in these systems.

Q. PLEASE DISCUSS THE WATER LOSS ANALYSIS.

A. In addition to an overview of the existing water system, the Company's detailed analysis includes measures to reduce water loss. The Company also conducted a distribution system analysis, including age, size, material type, leak history, soil conditions and other pertinent information, to evaluate all of its water main and service line infrastructure. This analysis included the development of detailed hydraulic modeling and recommendations of utility plant improvements required to reduce water loss. These recommendations include specific projects and detailed design and construction cost estimates. As I also discuss on pages 8-10, several water mains were replaced in the Coolidge water system to comply with the Commission's directive that the Company "shall reduce the non-account water for each of its systems to less than 10 percent by July 1, 2011."

Q. HAVE YOU REVIEWED WATER LOSS FOR THE COMPANY'S WESTERN GROUP WATER SYSTEMS?

A. Yes. As of September 2010, two systems have water loss percentages greater than ten percent, with one having water loss greater than fifteen percent.

Q. WHICH WATER SYSTEMS ARE THOSE?

A. The Coolidge water system, had an overall water loss of 10.81 percent, and, in particular, the Coolidge Airport water system, had a water loss of 39.18 percent for the calendar year 2009.

The Company already has made progress in reducing the Coolidge Airport water system losses, reducing water loss from 74.29 percent in February 2008 to 38.71 percent for the 12-months ending September 2010. The following table summarizes the Western Group water loss by ADEQ PWS system for calendar year 2009 and the twelve months ending September 2010.

ARIZONA WATER COMPANY Western Group Lost and Unaccounted for Water			
SYSTEM	PWS ID No.	CALENDAR YEAR 2009 REPORTED WATER LOSS	12-MONTH ROLLING AVERAGE ENDING SEPTEMBER 2010
Ajo	10-003	7.71%	6.47%
Coolidge	11-014	10.81%	11.31%
Coolidge Airport	11-707	39.18%	38.71%
Casa Grande	11-009	6.84%	5.24%
Tierra Grande	11-076	7.52%	7.03%
Stanfield	11-012	8.27%	7.96%
White Tank	07-128	5.12%	5.23%

Q. DID ANY WESTERN GROUP WATER SYSTEM HAVE WATER LOSS GREATER THAN TEN PERCENT IN THE COMPANY'S LAST RATE CASE?

A. Yes. The Company's Tierra Grande water system's water loss exceeded ten percent for calendar year 2007. Since then, the Company has been successful in reducing water loss in this system. The reported annual water loss for the system in 2009 was 7.52 percent, and for the 12 months ending September 2010 it was 7.03 percent. The Company anticipates the 2010 calendar year water loss to remain at that low level.

Q. THROUGH THIS INITIAL DETAILED REVIEW AND ANALYSIS COMPLETED BY THE COMPANY, WHAT WERE THE FINDINGS?

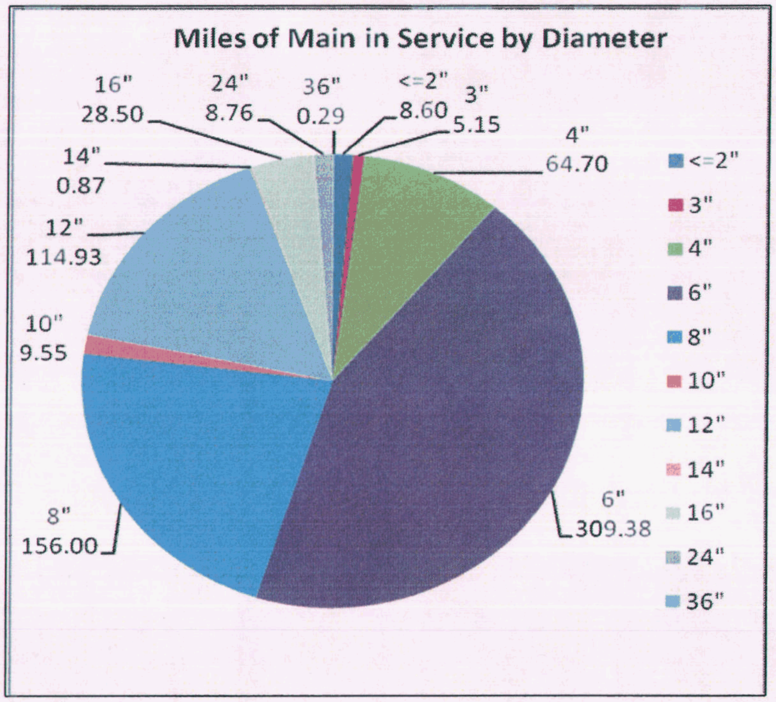
A. In reviewing the Company's efforts to reduce water loss, it was determined that between October 2009 and September 2010, water system operators spent nearly 16,000 hours monitoring, detecting and repairing water main and service leaks and breaks throughout the Pinal Valley water system. This is equivalent to approximately eight people working 40 hours per week for an entire year.

A review of the PVWS showed that many of the water system's water mains have been in service since the early 1920s, and are well past their useful service life. Many of these old water mains, some as small as 2-inch, do not comply with today's minimum standards. Because of their age and industry practice at the time, modern corrosion protection was not available when these types of water mains were installed and, as a result, are susceptible to numerous leaks, which are difficult to detect, locate and repair.

The PVWS experienced a significant amount of growth during the mid-1970s and, with that growth, came the installation of a large amount of CA water mains as well as the installation of polybutylene and polyethylene ("poly") water service lines. Unfortunately, poly service lines have proven to become brittle and split longitudinally. Repairing this type of service line is difficult and normally leads to their full replacement when leaks are discovered. It is estimated that approximately 600 failing poly services have been replaced since 2000.

However, over 3,700 of the failing poly service lines remain and require replacement in the very near future. Without these replacements, water losses are expected to increase.

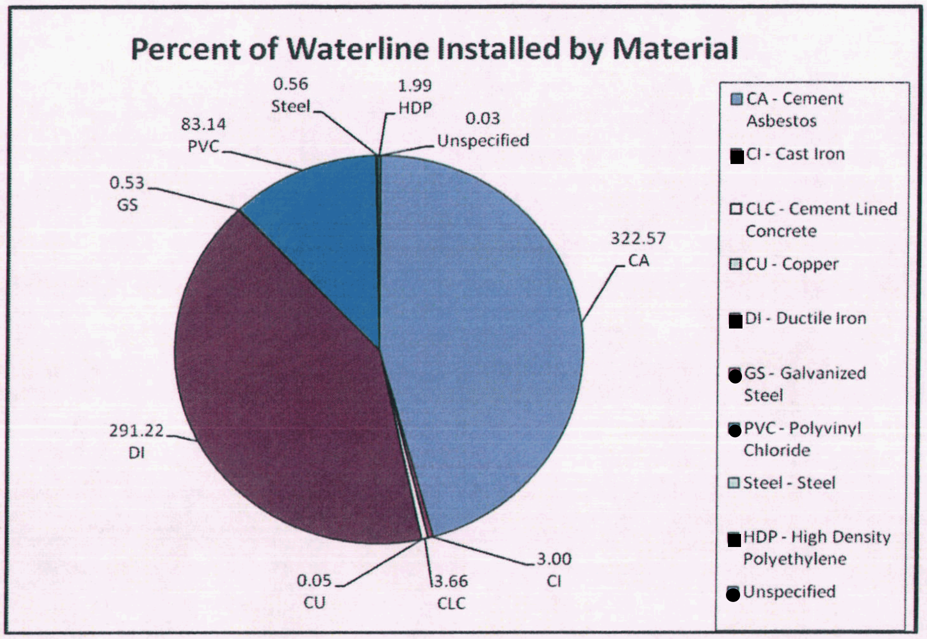
The following three charts depict the miles of main by size, material type and in service by decade installed within the Pinal Valley system, respectively.



Size	Miles of Main	Pipe Size	Miles of Main
<=2-inch	8.60	12-inch	114.93
3-inch	5.15	14-inch	0.87
4-inch	64.70	16-inch	28.50
6-inch	309.38	24-inch	8.76
8-inch	156.00	36-inch	0.29
10-inch	9.55		

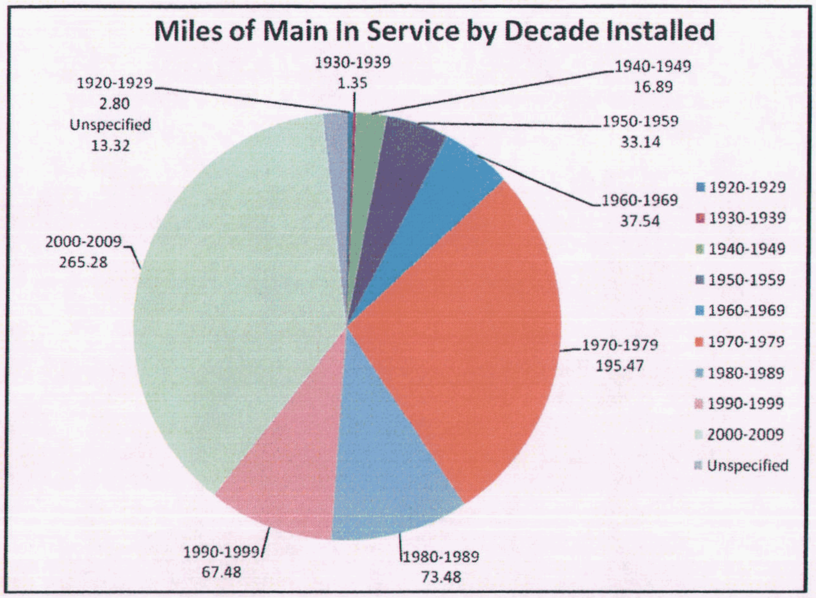
The above chart shows that 78.45 miles or over 416,200 LF of water mains in service today are less than six inches in diameter.

The following chart shows miles of water main currently in service by material type. A majority of the water mains are either DI or CA. Yet nearly 21,600 LF of water main is constructed of unprotected metal.



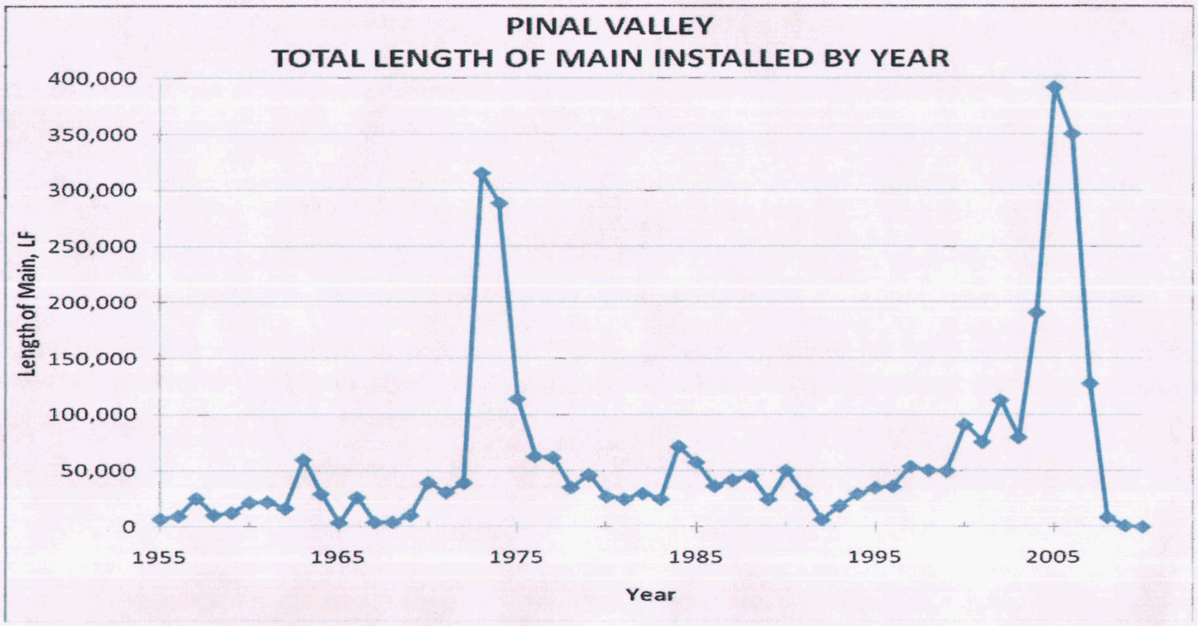
Material Type	Miles of Main	Material Type	Miles of Main
Cement Asbestos	322.57	Galvanized Steel	0.53
Cast Iron	3.00	High Density Polyethylene	1.99
Cement Lined Concrete	3.66	Polyvinyl Chloride	83.14
Copper	0.05	Steel	0.56
Ductile Iron	291.22	Unknown Material	0.03

The following chart depicts the miles of water main installed by decade and still in service. Three percent or 21 miles or over 111,000 LF of water main currently in service, was installed prior to 1950 and is over 60 years old. As described in Section 4 of the analysis detailed in Exhibit FKS-10, much of this water main is at or reaching the end of its useful service life.



Decade	Miles of Main	Decade	Miles of Main
1920-1929	2.80	1970-1979	195.47
1930-1939	1.35	1980-1989	73.48
1940-1949	16.89	1990-1999	67.48
1950-1959	33.14	2000-2009	265.28
1960-1969	37.54	Unspecified	13.32

The following graph shows the miles of water main installed by year since 1955. Note the significant length of water mains added in the mid-1970s and in the mid-2000s.



Q. THE FOREGOING DETAILED INFORMATION, CHARTS AND GRAPH SHOW A NEED TO REPLACE A SIGNIFICANT AMOUNT OF WATER MAINS AND SERVICE LINES WITHIN THIS WATER SYSTEM. HOW DOES THE WATER INDUSTRY CALCULATE THE COST OF REPLACING INFRASTRUCTURE?

A. In several ways. For example, the Handy Whitman Index of Public Utility Construction Costs is an engineering cost index that tracks the cost of constructing various types of public utility plant in different parts of the country. This index compares the cost of constructing public utility plant from one time period to another. As an example, for the PVWS, the older water mains in downtown Casa Grande were installed in 1921 and have a cost index of 27, while the current index is 587.

Q. WHAT DOES THIS CHANGE IN ENGINEERING COST INDEX MEAN IN TERMS OF DOLLARS TO INSTALL TRANSMISSION AND DISTRIBUTION MAINS IN 2010 VERSUS INSTALLING TRANSMISSION AND DISTRIBUTION MAINS IN 1921?

A. The index is used to project construction costs using today's cost index and comparing it to the cost index for the time period of the original installation. In the example above, the 2010 cost index (587) divided by the 1921 cost index (27) shows that the cost of constructing cast iron or ductile iron water mains in 2010 is almost 22 times the cost of installing the same pipe under the same conditions that may have existed in 1921.

Q. DOES THIS ENGINEERING COST INDEX ACCOUNT FOR THE FULL REPLACEMENT COST?

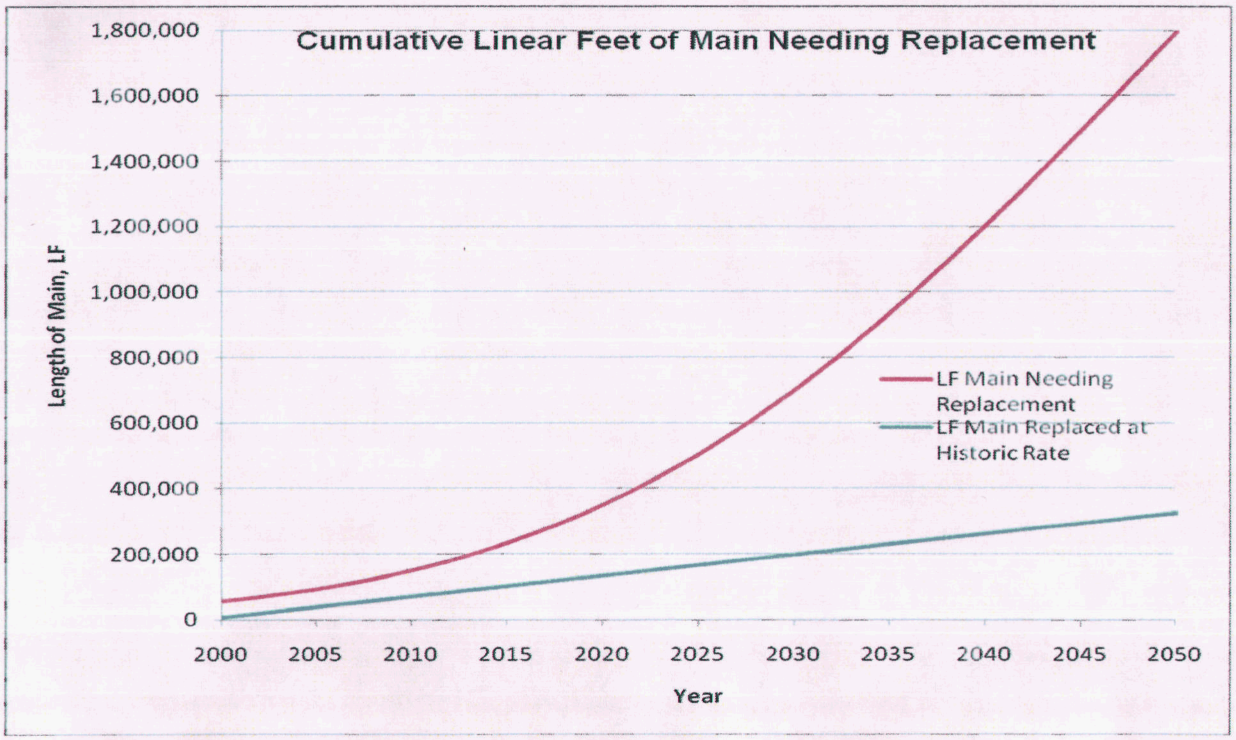
A. No. This engineering cost index does not account for changes in construction conditions that may have developed since 1921 or during any time period.

Q. PLEASE EXPLAIN FURTHER WHAT YOU MEAN BY CHANGES IN CONSTRUCTION CONDITIONS.

A. As a more detailed example of what is meant by this term, in the downtown area of Casa Grande, transmission and distribution mains were installed before streets were paved, curbing and gutters installed, telephone lines installed and other more recent underground utilities installed. Therefore, the cost of any replacement of transmission and distribution mains in these areas would have to include the cost of repairing streets and sidewalks, implementation of traffic control measures and working around other underground and above-ground installations to protect them against damage.

Q. HAS THE COMPANY PREPARED A TIMETABLE TO REPLACE THIS INFRASTRUCTURE?

A. Not yet. The graph below shows the current water main replacement rate within the PVWS based on the average replacement rate between 2000 and 2010 versus the needed rate of replacement. Based on the current replacement rate, the Company has determined that it would take 633 years to replace the existing infrastructure. The graph clearly depicts the current scenario where the existing replacement rate is not sufficient to keep pace with the water system needs.



With 90 year-old pipe already near failure or failing, it is not reasonable to assume that replacement sometime in the distant future would be adequate to comply with the Commission mandated reductions in water losses or ensure reliable or adequate water service. Without a sufficient funding mechanism, the required replacement rate cannot be achieved.

Q. HAS THE COMPANY PREPARED A COST ESTIMATE TO REPLACE THIS INFRASTRUCTURE?

A. The Company has prepared a cost estimate to replace the aging and failing water infrastructure in the PVWS and estimates that it will cost approximately $41 million to replace water mains and service lines as depicted in Appendix 9.11 of FKS Exhibit 10 which is also included as Exhibit FKS-11. This estimate was derived from water mains and service lines needing replacement between 2011 and 2020. Replacement unit costs were based on recent bids from other Company projects with the PVWS.

Q. HAS THE COMPANY CONSOLIDATED THE COOLIDGE AND CASA GRANDE WATER SYSTEMS FOR ADWR AND ADEQ REPORTING PURPOSES?

A. Yes. As authorized in Decision No. 71845, the Company's previous rate case, the Coolidge and Casa Grande water systems have been consolidated for ratemaking purposes. On October 21, 2010, the Company notified ADEQ that it was consolidating the Coolidge water system (PWSID No. 11-014) into the Casa Grande water system (PWSID No. 11-009). The Coolidge and Casa Grande water systems were physically interconnected in 2007. Notwithstanding, the reportable water loss for the water reporting year 2010 will be a value that represents the consolidated water system, the Commission-mandated water loss reductions in Coolidge must be corrected, as the Company undertook to accomplish shortly after the Commission issued that directive in Decision No. 71845.

Q. TO REDUCE WATER LOSS AS THE COMMISSION REQUIRED BY DECISION NO. 71845, WHAT SPECIFIC UTILITY PLANT IMPROVEMENTS HAS THE COMPANY COMPLETED TO REDUCE WATER LOSS IN THE COOLIDGE WATER SYSTEM?

A. The Company evaluated its Pinal Valley water distribution system through the use of its digital leak detection equipment, and analyzed data the Company collected over the past several years regarding main breaks and service line leaks. The Company determined that three very old and leaking waterlines in the Coolidge water system must be replaced right away to enable the Company to effectively reduce water loss to comply with the standard set by the Commission in Decision No. 71845. The Company then budgeted the additional funds needed to replace the aging and leaking facilities described below.

Project One

Project One is replacement of three waterlines currently located in alleyways in Coolidge between Coolidge and Elm Avenues and from Main Street to Arizona Boulevard (State Highway 87). The 4-inch CA water mains being replaced date back to the 1930s and 1940s. These projects replace of approximately 5,640 LF of 4-inch CA pipe and 200 LF of 6-inch CA, with 4,830 LF of 6-inch C-900 PVC pipe and 2,200 LF of 12-inch C-900 PVC pipe, at a total estimated construction cost of $927,860.

Project Two

Project Two is replacement of a waterline located in the Valley Farms portion of the Coolidge water system along Vah Ki Inn Road from Rhodes Court to McGee Road and along Moore Circle from Vah Ki Inn Road to McGee Road. The majority of this waterline was installed in the 1930s when rolled rubber gaskets were used as sealing material at the couplings. These types of gaskets, which are no longer used, inevitably cause problems as they age, leak and fail.

This project replaces approximately 2,000 LF of 6-inch CA pipe with 1,300 LF of 12-inch C-900 PVC pipe and 700 LF of 6-inch C-900 PVC pipe at an estimated construction cost of $166,532.

<u>Project Three</u>

Project Three is the replacement of a waterline at the Coolidge Airport. The 6-inch CA water main being replaced was originally installed in the 1930's.This project replaces approximately 3,680 LF of 6-inch pipe with 3,300 LF of 12-inch C-900 PVC pipe at an estimated construction cost of $258,608. Additionally, all metered connections were evaluated for accuracy and those meters found to be inaccurate were replaced.

Based on this information, and in accordance with the Commission's directive in Decision No. 71845, the Company quickly moved forward with the waterline replacement projects to replace the failing waterlines. All three of these projects will be completed by the Company before the Commission's July 1, 2011 deadline to comply with its order to reduce water loss. A detailed description of these three projects and supporting information is listed in Section III and Exhibit FKS-10.

Q. THESE URGENTLY-NEEDED WATER LINE REPLACEMENTS REPRESENT A SIGNIFICANT CAPITAL INVESTMENT BY THE COMPANY TO ADDRESS SYSTEM WATER LOSS. HOW DID THE DECISION TO MAKE THIS INVESTMENT COME ABOUT?

A. Apart from the very high losses of water from these old leaking water lines, the most compelling reason came from the Commission itself. The Commission ordered the Company to reduce water loss in *<u>all</u>* systems to less than ten percent by July 1, 2011. For the PVWS, the Company determined that locating and repairing leaks and breaks alone could not comply with this water loss reduction mandate. Despite the Company's aggressive water loss reduction efforts, these efforts have not been enough to reduce water loss in all systems to less than ten percent as the Commission required.

Q. WILL THESE WATER LINE REPLACEMENTS AID IN REDUCING WATER LOSS TO LESS THAN TEN PERCENT?

A. Yes. These water line replacements are critical in reducing water loss and complying with the Commission's order to immediately reduce water loss. However, more replacements of aging infrastructure are needed in the PVWS to comply with water loss requirements. The solution to this problem requires a going-forward commitment to the planned replacement of aging and failing waterlines with new appropriately sized waterlines. This will directly address the Commission's directive to the Company to reduce water loss. The replacement of a growing number of service lines is also required, as failing service lines are another significant source of water loss. Due to this critical need, the Company has developed the plan that is detailed in Section 6.0 of the report attached as Exhibit FKS-10.

Q. HOW IS THE COMPANY PROPOSING TO RESOLVE THE GAP IN INFRASTRUCTURE REPLACEMENT TO REDUCE WATER LOSS AND KEEP IT LOWER THAN TEN PERCENT?

A. As stated previously, the Company has prepared a detailed plan to begin replacing water mains and service lines that are critically needed to reduce water loss. The detailed plan includes replacing approximately 16,600 LF of aging water mains and 570 aging service lines each year.

Q. WHAT IS THE ESTIMATED COST OF THESE REPLACEMENTS?

A. It is estimated that these replacements will cost $2.5 million dollars annually.

Q. CAN THE COMPANY CURRENTLY FUND THE REPLACEMENTS OF AGING INFRASTRUCTURE NEEDED TO REDUCE AND MANAGE WATER LOSS TO LESS THAN TEN PERCENT?

A. No, not without adequate rate relief and the benefit of an effective cost recovery mechanism such as a Distribution System Improvement Charge ("DSIC"). As discussed in Mr. Harris' and Mr. Garfield's direct testimony, the Company cannot construct these necessary water system replacements and incur the costs of doing so without a change in the way they are recovered.

Q. IS THE COMPANY MAKING ANY PROPOSALS TO ALLOW IT TO FUND THESE TYPES OF CRITICALLY NEEDED UTILITY PLANT REPLACEMENTS?

A. Yes. In other jurisdictions, utility commissions have authorized a DSIC to facilitate infrastructure replacement. The benefits of such a program include more efficient and timely investment of capital, significant progress in replacing aging infrastructure and enhanced service quality and reduction of water loss. As water supplies become more stressed in the future, reducing water loss through the replacement of aging infrastructure will become even more important. Such programs typically include protections for customers such as limits on the amount of incremental revenues that can be collected, exclusion of capital projects that are revenue producing and true-up mechanisms. Details of the DSIC program are presented in the direct testimony of Mr. Harris, while Mr. Garfield's direct testimony discusses the public policy aspects of a DSIC.

Q. DSIC PROCEDURES ORIGINATED IN THE EASTERN PORTION OF THE UNITED STATES. IS THE PROBLEM OF AGING INFRASTRUCTURE UNIQUE TO THAT AREA?

A. No. The Company's water systems throughout Arizona have facilities that are obsolete, beyond their useful life, and are already failing and need to be replaced. As presented and discussed in Section 4.0 of Exhibit FKS-10, water mains installed and placed in service during the 1920s, 1930s and later have reached the end of their useful service life regardless of where they were installed.

Q. HAVE YOU PREPARED AN ANALYSIS OF AGING INFRASTRUCTURE IN THE PVWS?

A. Yes. The analysis shows approximately 287,000 LF of water main or approximately 7.7 percent of the PVWS is in need of replacement including 3,700 poly service lines, and another 3,500 galvanized service lines over the next 5-10 years. This analysis is based on a complete review of the documented water main and service line repair history summarized in Appendix 9.1 of Exhibit FKS-10. The specific replacement projects are presented in detail in Appendix 9.10 of Exhibit FKS-10. As explained on page 54 of my testimony, the Company estimates that replacing these failing water mains and service lines will cost $41 million. An explanation of this detailed cost estimate is provided in Exhibit FKS-11. Each year, these costs will increase and the quantity of aging water mains and service lines that have exceeded their useful service life will increase, thereby making it increasingly more difficult to keep up with necessary replacements.

Q. THE PVWS CONSISTS OF WATER MAINS AND SERVICE LINES DATING BACK TO THE 1920s. WHY ARE THESE OLD FACILITIES A PROBLEM?

A. There are numerous studies which have been completed documenting the failure of infrastructure installed during this time period.[2] [3] Materials used to make and join distribution system piping have evolved over time. From the late 1800s until the 1920s, most piping installed was manufactured from "pit" cast iron and was

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[2] DeBerry, David W., Kidwell, James R., Malish, David A. (1982). *Corrosion in Potable Water Systems.* United States Environmental Protection Agency.

[3] Thomson, James and Wang, Lili (2009). *State of Technology Review Report on Condition Assessment of Ferrous Water Transmission and Distribution Systems.* United States Environmental Protection Agency

joined using rope and molten lead. Some of the older water mains in the PVWS are of this type of cast iron.

Beginning in the late 1920s, up to and including the 1960s, "spun" cast iron was primarily used. It is stronger and more uniform than "pit" cast iron and allowed for thinner pipes. These improved cast iron water mains were installed without corrosion protection or polyethelyene encasement. Over time, these thinner-walled unprotected cast iron mains are corroding and failing. Cement lining and leadite joining compound (a plasticized sulfur cement) were introduced during the same time period, although leadite joints were eventually found to have increased splitting and corrosion compared to lead. Flexible rubber gasket joints and ductile iron pipe were introduced in the 1950s and 1960s, respectively, improving joints and reducing corrosion rates. The use of PVC and high density polyethylene (HDPE) pipe began to emerge in the 1970s and 1990s, respectively. Cast iron piping (both pit and spun), installed in the 1920s and later, is approaching the end of its useful life, and many main breaks are associated with this type of pipe.

Deteriorating water distribution system infrastructure include increased leakage and breaks; taste, odor and rusty water complaints; as well as reduced flow capacity and reduced chlorine levels due to corrosion products and biofilms. Consequently, there is an increased potential for water quality degradation and health risks associated with aging infrastructure. As a result, this aging piping needs to be replaced. The analysis included as Exhibit FKS-10 discusses, in detail the numerous problems associated with these aging facilities.

Q. DO THE PVWS OPERATORS ROUTINELY DISCOVER WATER LEAKS?

A. Yes, very definitely. The Company found and repaired over 1,250 leaks between January 2005 and December 2010 in the PVWS as described in Section VII of this testimony and, as shown in Appendix 9.1 of Exhibit FKS-10. This equates to approximately one leak repair per work day. Approximately seventy-two percent of the recorded leaks were service line leaks. All leaks are repaired promptly after their detection and location. According to a study completed by the Aging Water Infrastructure Research division of the Environmental Protection Agency, there are 240,000 water main breaks per year in the United States or a water main break 650 times per day[4]. That equates to one main break every two minutes. For the Company's PVWS, that was a waterline leak practically every work day for five years.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY IN THIS MATTER?

A. Yes.

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[4] *Water Distribution Systems* (2009). United States Environmental Protection Agency Aging Water Infrastructure Research Program, http://www.epa.gov/awi/distributionsys.html (Oct. 28, 2010).

FKS-1

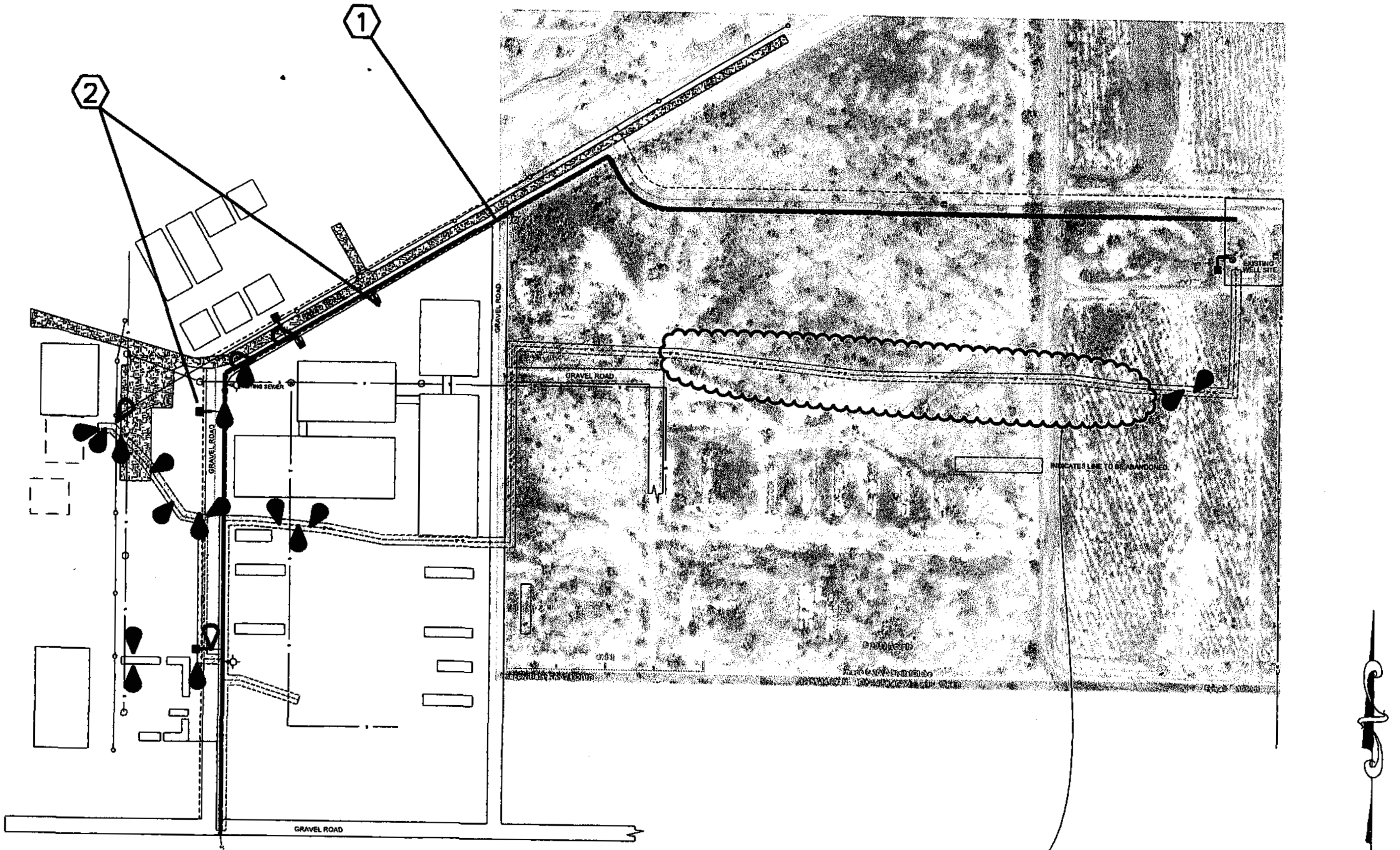
FKS-1

POST TEST YEAR PLANT ADDITIONS – PROJECT DETAIL

INDEX

WA1-4768

COOLIDGE AIRPORT



SANDY SOILS – AREA OF SUSPECTED NON-SURFACING LEAKS

0 400 800

QUANTITIES LIST

ITEM		QTY.
1	INSTALL 12" PVC	3,400 LF
2	INSTALL SERVICE	5 EA.

PRELIMINARY DRAWING
VALVE AND FIRE HYDRANT LOCATION
TO BE DETERMINED IN PROJECT DESIGN

WATER SERVICES TO BE DOUBLE SERVICES WHERE POSSIBLE

WATER MAIN REPAIR/REPLACEMENT

SERVICE LINE REPAIR/REPLACEMENT

ARIZONA WATER COMPANY

PROJECT DESCRIPTION

INSTALL 3,400 LF OF 12" PVC AND 5 SERVICE CONNECTIONS AT THE COOLIDGE AIRPORT.

PROJECT LOCATION

NW 1/4 SEC. 4-T.6S., R.9E.

DRAWN BY:	APPROVED BY:	DATE:	REFERENCE MAP:
JS	AH/FS	12/29/2010	N/A

Coolidge Airport

LEAK LOCATION	SECTION	DATE	TYPE
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2009	Service Replacement
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
3644 S Hanger Drive	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Service Replacement
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
6300 N Airport Road (Office)	NW 1/4 Sec 4 T6S R9E	2009	Main Repair
9300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2009	Service Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of 6300 N Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
South of Airport Road	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
Southwest of North Well Yard	NW 1/4 Sec 4 T6S R9E	2010	Main Repair
Southwest of North Well Yard	NW 1/4 Sec 4 T6S R9E	2010	Service Repair

ARIZONA WATER COMPANY
WORK AUTHORIZATION

W.A. NUMBER: 1-4768
P.E. NUMBER:
BUDGET ITEM NO.: Special #23
SHEET NO.: 1 of 2

SYSTEM:	PINAL VALLEY		
DIVISION:	PINAL VALLEY	WORK TO START BY:	UPON AUTHORIZATION
TAX CODE:	2100	WORK TO BE FINISHED BY:	WITHIN 85 DAYS

√

DESCRIPTION OF WORK:

Coolidge Airport Main Replacement project: Replace approximately 3,680 lf of 6-inch PVC pipe with 3,300 lf of 12-inch C-900 PVC. Construct in accordance with attached drawings and/or Arizona Water Company specifications.

FACTORS JUSTIFYING WORK:

The Company has experienced several leaks on these waterlines due to age of the pipe and sandy soil making leaks hard to find and contributing to increasing water loss in the Coolidge system, Specifically the Coolidge Airport.

COST ESTIMATE		
COST OF WORK:		
MATERIAL		0
LABOR		9,155
CONTRACT PORTION		199,400
OVERHEAD		50,053
TOTAL AUTHORIZED EXPENDITURES CHARGEABLE TO THIS W.A.	$	258,608
FUNDS RECEIVED:		
CONTRIBUTIONS RECEIVED		0
REFUNDABLE ADVANCES RECEIVED		0
TOTAL CONTRIBUTIONS/ADVANCES		0
NET CASH REQUIRED	$	258,608

COMMENTS:

AUTHORIZATION	DATE
PREPARED BY: James Wilson JW 10/27/10	10/22/10
REVIEWED FOR ESMT/ROW VERIFICATION: Charles Briggs CB 10-28-2010	10-22-2010
REVIEWED BY: Mike Loggins ML 10-28-10	10-22-10
APPROVED BY ENGINEERING: Fredrick Schneider FS 10-28-10	10-22-10
APPROVED BY FINANCE: Joseph Harris	10/22/10
SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY PRESIDENT: William Garfield	10-22-10
SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY CHAIRMAN: M. L. Whitehead APPROVED VIA FAX	10/27/2010

CONSTRUCTION RELEASE:

RELEASED TO CONSTRUCTION
Authorized by FRED. SCHNEIDER
Date 10/27/10

AFH

ARIZONA WATE COMPANY

***WORK AUTHORIZATION* - DETAIL SHEET**

W.A. NUMBER: 1-4768
P.E. NUMBER:
BUDGET ITEM NO.: Special #23
SHEET NO.: 2 of 2

RETIREMENT PROPERTY UNITS	PLANT PROPERTY ACCOUNT	UNIT DESCRIPTION	QUANTITY	YEAR INSTALLED AND W.A. NUMBER
	343	6-inch CA pipe	3680	1935

PROJECT DESCRIPTION:

Coolidge Airport Main Replacement project: Replace approximately 3,680 lf of 6-inch PVC pipe with 3,300 lf of 12-inch C-900 PVC.

	DESCRIPTION	PLANT PROP ACCT	QUANTITY	UNIT COST	TOTAL
CONTRACT WORK	12" C-900 PVC w/ all related fittings	343	3,300	$ 50.00	$ 165,000
	Tie into existing 6" PVC with 6" TS&V	343	2	2,700.00	5,400
	Tie over existing services to new main	345	7	3,500.00	24,500
	Replace existing 6" fire hydrant assembly	348	1	4,500.00	4,500
	SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-SHORT	345			
TOTAL CONTRACT WORK					$ 199,400
MATERIALS	SERVICE CONNECTIONS: DOUBLE-LONG	345			
	SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS: SINGLE-LONG	345			
	SERVICE CONNECTIONS: SINGLE-SHORT	345			
	METERS	346			
TOTAL MATERIALS					$ -
LABOR	TESTING FEE	343	1	$ 1,000.00	1,000
	PERMIT FEE	343	1	1,500.00	1,500
	SURVEY FEE	343	1	4,500.00	4,500
	FIELD INSPECTION	343	1	2,155.00	2,155
	INSTALL SERVICE CONNECTIONS: DOUBLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-SHORT	345			
TOTAL LABOR					$ 9,155
SUBTOTAL - CONTRACT WORK, MATERIALS, AND LABOR					$ 208,555
OVERHEAD					50,053
TOTAL	REFUNDABLE PORTION ☐	NON-REFUNDABLE PORTION ☐		COST ESTIMATE	$ 258,608

AFH

OFFICIAL RECORDS OF
PINAL COUNTY RECORDER
LAURA DEAN-LYTLE

DATE/TIME: 11/29/2010 1416
FEE: $11.00
PAGES: 3
FEE NUMBER: 2010-110981

3

When recorded return to:

Norma Ortiz, City Clerk
City of Coolidge
130 W. Central Avenue
Coolidge, Arizona 85128

GRANT OF EASEMENT

This Agreement made and entered into this 22nd day of November, 2010, by and between the City of Coolidge ("Grantor"), an Arizona municipal corporation, and the Arizona Water Company, an Arizona corporation ("Grantee").

Recording Requested By:
ARIZONA WATER COMPANY
When Recorded, Mail To:
Arizona Water Company
P.O. Box 29006
Phoenix, Arizona 85038-9006

ABOVE SPACE RESERVED FOR COUNTY RECORDER

GRANT OF EASEMENT
CITY OF COOLIDGE,

an Arizona municipal corporation, organized under the laws of the State of Arizona (hereinafter referred to as "Grantor"), for a valuable consideration, receipt of which is hereby acknowledged, grants to ARIZONA WATER COMPANY, an Arizona corporation, its successors and assigns (hereinafter referred to as "Grantee"), a perpetual non-exclusive easement and the right to excavate for, install, operate, maintain, remove or replace one or more pipelines, including valves, hydrants, meters and other equipment and appurtenances, for the purpose of conveying water for domestic use, fire protection and irrigation, ingress and egress, or other purposes, and to use the same for such purposes, on that certain real property in the County of Pinal, State of Arizona, described as follows:

A parcel of land as described in Docket 225, Page 106, records of Pinal County, Arizona, lying within and being a part of Sections 4 and 5, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, described as follows:

Lots 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, and 14; The South half of the Northeast quarter; The South half of the Northwest quarter; The Southwest quarter; The North half of the Southeast quarter, all in said Section 4;

Lots 7, 8, 9, and 10; The South half of the Northeast quarter; The North half of the Southeast quarter, all in said Section 5.

EASEMENT DESCRIPTION

An easement 50.00 feet wide, lying 25.00 feet on each side of the following described centerline, lying within and being a part of Section 4, Township 6 South, Range 9 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona, said easement centerline being more particularly described as follows:

COMMENCING at the Northeast corner of said Section 4, from which the North quarter corner of said Section 4 bears N89°29’07”W, a distance of 2642.22 feet;

Thence S03°46’21”W, a distance of 2117.74 feet to the POINT OF BEGINNING;

Thence S89°56’23”W, a distance of 1392.28 feet to a point of curvature;

Thence Northwesterly along the arc of said curve, concaved to the Northeast, having a radius of 100.00 feet, through a central angle of 59°59’40”, with an arc length of 104.71 feet;

Thence N30°04’06”W, a distance of 77.52 feet to a point on the centerline of Aviation Avenue;

Thence S60°01’59”W, along the centerline of Aviation Avenue a distance of 969.80 feet;

Thence S00°01’10”W, a distance of 1578.66 feet to the POINT OF TERMINUS.

GRANTOR agrees for itself, its successors and assigns that no building or other structure will be constructed, or other obstruction placed, over this easement or over any facilities of Grantee; provided, however, that with Grantee's prior consent, Grantor may build over this easement after first paying to Grantee the cost of relocating the facilities and granting an alternative easement satisfactory to Grantee and without additional cost to Grantee.

GRANTEE, its agents and employees, shall at all times have the right of unobstructed ingress to and egress from said Real Property, and free access to said water system facilities pipelines, equipment and appurtenances for the purpose of maintaining, operating, removing or replacing same including the right to trim or remove any trees or shrubs that in Grantee's judgment interfere with the rights herein granted. Grantee agrees to use reasonable care to avoid damage to the property of Grantor in the exercise of this easement.

The individual signing this Agreement warrant that they have read this Agreement, have the authority to execute this Agreement, and will furnish such evidence reasonably necessary to validate such authority upon request.

EXECUTED this 22nd day of NOVEMBER, year of 2010

CITY OF COOLIDGE

By: Robert F. Flatley

Title: City Manager

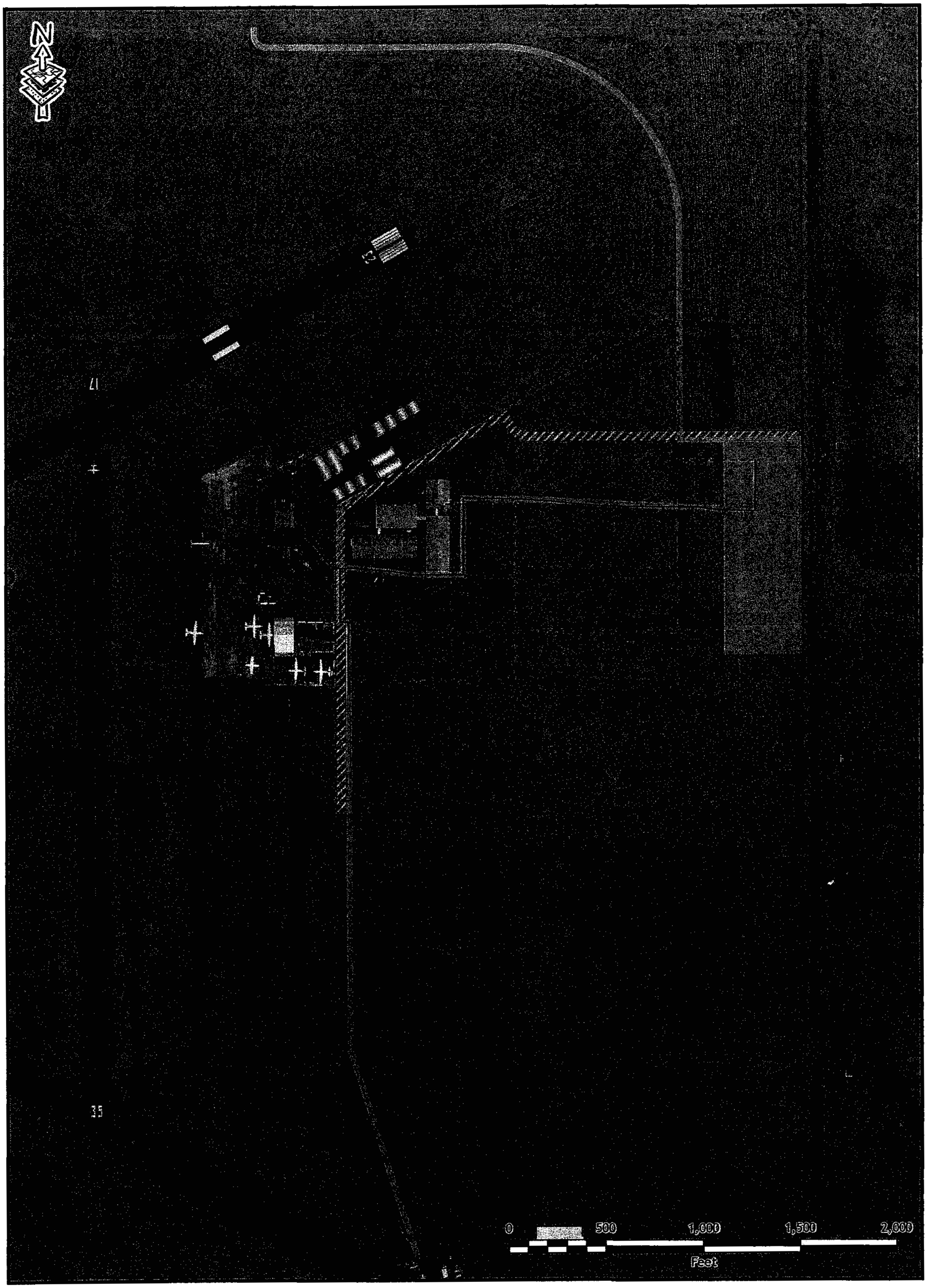
STATE OF ARIZONA)
) ss
COUNTY OF PINAL)

This foregoing instrument was acknowledged before me this 22nd day of NOVEMBER in the year 2010 by ROBERT F. FLATLEY, CITY MANAGER, of the City of Coolidge, an Arizona municipal corporation, on behalf of the corporation.

My Commission Expires: NORMA C. ORTIZ NOTARY PUBLIC - ARIZONA PINAL COUNTY My Commission Expires August 21, 2014

Norma C. Ortiz
Notary Public

JJW



CITY OF COOLIDGE · ARIZONA

Arizona Water Company Easements @ Coolidge Airport

Active Water Lines (per Blue Stake)
Existing AZ Water Company Easements
Inactive Water Lines (per As-builts)
New Water Easement

(1)

ARIZONA WATER COMPANY

Casa Grande Office: PO Box 11030 - Casa Grande, AZ 85130 - 1030
Voice: 520-836-2850 Fax: 520-836-2850

PROPOSAL/CONTRACT

CONTRACTOR: Central Arizona Pipeline Contractor's, Inc

AZ CONTRACTOR LICENSE NO: ROC 164758 CLASSIFICATION: K-80

ADDRESS: PO Box 336 Coolidge, AZ 85128

SYSTEM: Coolidge Airport

W.A. No(s):

BID DUE DATE: October 22, 2010

BID BOND REQUIRED: [X] Yes [ ] No

DESCRIPTION OF PROJECT: Install approximately 3400 L.F of 12" Ductile Iron Pipe and tie over existing services all with related fittings in easements at Coolidge Airport in a portion of the of Sec 4 T.6S., R.9E.

1-2. MATERIALS EXEMPT FROM CONTRACTING TAX (per Paragraph 6)	QUANTITY	UNIT PRICE LABOR	UNIT PRICE MATERIALS	TOTAL COST LABOR	TOTAL COST MATERIALS
Tie 12" Ductile Iron Pipe to existing 8" pipe w/related fittings	1	581	500	581	500
Tie 12" Ductile Iron Pipe to existing 3" pipe w/related fittings	1	581	300	581	300
Install 12" Ductile Iron Pipe w/14ga locator wire and related fittings	3400 L.F	2.05	23.56	6970	80104
Install a 12"x6" MJxFL tee w/a 6" MJxFL GV and related fittings (FH)	2	145	909	290	1818
Tie existing 6" FH to 6" MJxFL GV w/related fittings	1	264	700	264	700
Install a 6" fire hydrant w/related fittings	1	387	2479	1 387	2 2479

3. Total Labor to Install Exempt Materials (add the amounts in column 1) 3 9073

4. Total Exempt Materials (add the amounts in column 2) 4 85901

5-6. NON-EXEMPT MATERIALS	QUANTITY	LABOR	MATERIALS	LABOR	MATERIALS
Install a short 1" copper service w/related fittings	2	91	500	182	1000
Install a long 1" copper service w/related fittings	1	150	600	150	600
Install a long 2" copper service w/related fittings	2	295	2589	590	5178
Tie new 2" service to existing customer line w/2" ball valve and rltd fittings	2	100	250	200	500
Tie new 1" service to existing long customer line w/1" ball valve and rltd fittings	2	200	500	400	1000
Tie new 1" service to existing customer line w/1" ball valve and rltd fittings	1	100	350	5 100	6 350

7. Total Labor to Install Non-Exempt Materials (add the amounts in column 5) 7 1622
8. Total Non-Exempt Materials (add the amounts in column 6) 8 $8528
9. Subtotal A (add lines 3, 7 and 8) 9 $19223
10. Contracting Tax Base (multiply the amount on line 9 by 0.65) 10 $12494.95
11. Applicable Contracting Tax Rate 11 10.7%
12. Contracting Tax (multiply the amount on line 10 by line 11) 12 1336.96
13. Subtotal B (add lines 4, 9 and 12) 13 106460.96
14. 100% Performance and Payment Bonds Cost 14 3193.83
15. Estimated Total Cost (add lines 13 and 14) 15 109654.79

NOTE: The Estimated Total Cost includes all labor and materials for backfill, pavement replacement, chip seal, and traffic control necessary for the Project.

ARIZONA WATER COMPANY

Casa Grande Office: PO Box 11030 - Casa Grande, AZ 85130 -1030
Voice: 520-836-8785 Fax: 520-836-2850

PROPOSAL/CONTRACT

CONTRACTOR: Central Arizona Pipeline Contractor's Inc.	SYSTEM: Coolidge Airport
ADDRESS: PO Box 338 Coolidge, AZ 85128	W.A. No(s):
	BID DUE DATE: October 22, 2010

CONTRACTOR SUBMITS this PROPOSAL/CONTRACT to ARIZONA WATER COMPANY, an Arizona corporation (the "Company"), to perform the work and complete the project described on Page 2 (the "Project"), as an independent prime contractor.

1. Contractor certifies that it has a complete copy of, and has read, understands and accepts, the Company's General Conditions of Contract, and the Company's Construction Specifications and Standard Specification Drawings, (the "Specifications"), all of which are attached hereto. Contractor has examined the specific plans and related construction drawings for the Project (the "Drawings"), copies of which are also attached hereto. The General Conditions of Contract, Specifications and Drawings are incorporated into this Proposal/Contract. Contractor affirms that all work and materials to be furnished or purchased for the Project will be in strict conformance with the General Conditions of Contract, Specifications and Drawings.

2. Contractor represents and warrants that it has satisfied and complied with the provisions of Section 6, Contractor Understands Work and Working Conditions, of the General Conditions of Contract prior to submitting this Proposal/Contract.

3. Contractor represents that this Proposal/Contract is fair and honest in all respects, is submitted in good faith and is not submitted in collusion with any other company, entity or person.

4. Contractor acknowledges that one hundred percent (100%) Performance and Payment Bonds are required and must be provided to the Company prior to the commencement of work.

5. Prior to the commencement of work, Contractor will submit to the Company a list of all materials to be used in the Project. The materials list will include the manufacturer, part number, price and quantity included in this Proposal/Contract.

6. Contractor will furnish all labor, tools, equipment and materials required to complete the Project according to the General Conditions of Contract, Specifications and Drawings. No materials purchased by Contractor to be incorporated into the Project are subject to tax at the time of purchase and Contractor will not charge the Company for any such tax. Contractor will pay the applicable transaction privilege tax (the "Contracting Tax") on the Project after Contractor receives payment of the final Project invoice from the Company. The cost of materials incorporated into the Project which are exempt by *Arizona Revised State Statues* ("A.R.S.") *from the Contracting* Tax, for example, pipes or valves having a diameter of four (4) inches or larger, including equipment, fittings and any other related part that is used in operating the pipes or valves (A.R.S. §42-5061 B.6.), will not be included in the total cost of the labor and materials upon which the Contracting Tax is computed. Contractor retains full liability and obligation to pay the Contracting Tax and will defend and indemnify the Company against any demand or obligation to pay the Contracting Tax.

7. Contractor will maintain detailed accounting records of all materials purchased and incorporated into the Project. Such records will include all supporting original vendor invoices for all materials purchased. Following completion of the Project, Contractor will submit an itemized accounting to the Company which will include all supporting original vendor invoices and satisfactory evidence of payment thereof. The Company will not pay Contractor for materials not actually incorporated into the Project, and the disposition of such materials will remain Contractor's responsibility.

8. The Estimated Total Cost of the Project, shown on Page 2, is based on estimated labor and material quantities to be furnished. It includes an estimate of the Contracting Tax and the cost of the required Performance and Payment Bonds. Contractor will not cancel, modify or withdraw this Proposal/Contract during a ninety-day (90) period commencing on the Bid Due Date. The Company may accept this Proposal/Contract by signing and mailing, or otherwise delivering, a copy hereof to Contractor during such ninety-day (90) period. If the Company does not accept this Proposal/Contract during such ninety-day (90) period, *Contractor may cancel this Proposal/Contract by giving written notice of cancellation to the* Company.

9. Prior to the commencement of work, Contractor will provide the Company with a detailed construction schedule, in either Gantt or CPM form, identifying all tasks to be performed from the date of the written Commencement Notice through completion of the Project, including testing, training of Company Personnel and final Project invoicing. Contractor will provide the Company with a copy of such construction schedule documenting the progress of work on the Project at least monthly.

10. Contractor will not commence work on the Project until the Company gives Contractor a written Commencement Notice. Contractor will complete the Project within 60 calendar days after the Commencement Notice is issued.

11. Following the Company's written notice of satisfactory completion of the Project, and upon receipt of the final Project invoice from Contractor, the Company shall pay Contractor the actual total cost of the Project, which will be calculated as shown on Page 2, except that actual labor and material quantities installed/constructed will be substituted for the estimated labor and materials quantities and the Contracting Tax will be recalculated based on such actual labor and materials quantities.

12. The amount of applicable liquidated damages for Contractor's failure to deliver or perform within the time limit *shown in Paragraph 10 may be deducted from the Company's* payment of the final Project invoice. This provision shall not limit the Company's ability to terminate this Proposal/Contract for Contractor's unsatisfactory performance or failure to perform as provided in the General Conditions of Contract, Specifications or Drawings, or in this Proposal/Contract.

SPECIAL CONDITIONS:

NONE

CONTRACTOR	PROPOSAL/CONTRACT ACCEPTED:
Central Arizona Pipeline Contractor's Inc.	ARIZONA WATER COMPANY
By: [signature]	By: [signature]
Print Name: Clinton White	Print Name: ~~Roy Freeman~~ Fredrick K Schneider
Title: President	Title: ~~Operations Superintendent~~ VP Engineering
Date: 10/22/10	Date: 11-28-10

RGM

ARIZONA WATER COMPANY

E-4-1

GENERAL CONDITIONS OF CONTRACT

DEFINITIONS

A. Company. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).

B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.

C. Contractor. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.

D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.

E. Invitation to Bid. The term "Invitation to Bid" means the current copy of Arizona Water Company's Form E-3-11-4 Request for Proposal/Contract or Form E-3-12-2 Invitation to Bid.

F. Contract. The word "Contract" means the written document titled "Contract" or "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

G. Inspector. The word "Inspector" means the Company's Authorized Representative or a person designated in writing by the Company's Authorized Representative.

GENERAL CONDITIONS OF CONTRACT

1. GENERAL

These General Conditions of Contract govern all works of installation and construction unless deviations are provided for on the Construction Drawings or in the Contract.

2. BONDS

The Contractor shall, upon request by the Company, furnish a performance bond and a material payment bond in the amount of 100% of the Contract price, in a form and from a surety acceptable to the Company.

3. LABOR AND/OR MATERIAL RELEASES

The Contractor shall supply labor and/or material releases satisfactory to the Company when requested to do so. Forms will be provided by the Company.

4. LICENSE

The Contractor shall have, as may be required by law, a valid license applicable to the work to be performed.

5. INSURANCE

The Contractor shall maintain in full force and effect insurance at no less than the following minimum amounts:

WORKER'S COMPENSATION	In accordance with requirements of the laws of the State of Arizona.
COMPREHENSIVE GENERAL LIABILITY (Including contractual liability covering death, bodily injury and property damage)	Combined single limit of not less than $1,000,000 for each occurrence.
AUTOMOTIVE LIABILITY (Including owned, non-owned and hired vehicles)	Combined single limit of not less than $1,000,000 for each occurrence.
SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE AND VEHICLE LIABILITY INSURANCE	Contractor shall either require each of its subcontractors to procure and to maintain Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in this Section 5 or insure the activities of its subcontractors in Contractor's own policy, in like amounts.

Such insurance shall name the Company, its officers, agents, and employees as additional insured and be primary for all purposes.

The Company will at all times have the right to require that all of such insurance be placed with insurance companies that are satisfactory to it. The Contractor shall file with the Company a certificate evidencing that each policy of insurance for the above coverages in the minimum amounts specified has been purchased and is in good standing.

Such certificate shall provide that notice be given to the Company at least thirty (30) days prior to cancellation or material change in the form of such policies or any of them. Such certificates shall be kept on file by the Company and the Company must have current certificates on file, or a certificate must accompany any bid proposal, before that proposal will be accepted by the Company.

6. CONTRACTOR UNDERSTANDS WORK AND WORKING CONDITIONS

By executing a Contract with the Company, the Contractor warrants that it has, by careful examination, satisfied itself as to the nature and location of the work, including soil conditions, the character, quality and quantity of the materials to be encountered, the character of the equipment and facilities needed preliminary to and during prosecution of the work, the general and local conditions, and all other matters which can in any way be expected to affect its work under the Contract. Verbal agreements or conversations with any officer, agent or employee of the Company, either before or after the execution of the Contract, are not binding upon the Company and shall not affect or modify any of the terms or obligations herein contained.

7. SPECIFICATIONS AND DRAWINGS

The Contractor shall keep on the job a complete copy of all drawings and specifications furnished by the Company which are applicable to the Contract with the Company. Anything mentioned in the specifications and not shown on the drawings or shown on the drawings and not mentioned in the specifications shall be of like effect as if shown or mentioned in both. In case of a discrepancy between the figures, drawings or specifications and physical conditions of the job, the matter shall be immediately submitted to the Company's Authorized Representative for decision as to adjustments, if any, because of the discrepancy; without a decision from the Company's Authorized Representative no discrepancy shall be adjusted by the Contractor, save only at its own risk and expense. Any deviation from the specifications must be approved in writing by the Company's Authorized Representative.

8. PROPERTY PROTECTION

Trees, fences, poles, underground structures and all other property shall be protected unless their removal is authorized on the Construction Drawings. Any property damaged shall be restored by the Contractor, at its expense, to the owner's satisfaction.

9. SPECIAL PERMITS, LICENSES AND INSURANCE

The Company shall obtain all permits for railroad, county, state, city and irrigation district rights-of-way as well as Forest Service, State Land Department and Bureau of Land Management permits. (Pipeline Contractors)

Whenever blasting is required, the Contractor shall obtain all permits, licenses and insurance required at its expense. (All Contractors)

The Contractor will be required to obtain, and shall certify in writing to the Company that it has obtained, all additional permits required to perform the work including, but not limited to, a National Pollution Discharge Elimination System Permit and/or an Aquifer Protection Permit as those permits relate to disposal of drilling, development and test waters and/or any other discharge or similar activity. (Well Drilling Contractors)

10. SURVEYS

The Company shall be responsible, or arrange, for all surveys required for the work covered in the Contract, unless otherwise specified.

11. BENCH MARKS, PROPERTY STAKES AND SURVEY STAKES

Bench marks, property stakes and survey stakes shall be preserved by the Contractor; in case they are destroyed or removed by Contractor or its employees, the Company will replace them at the Contractor's expense, and the Contractor and its sureties shall be liable therefore.

12. TOOLS, EQUIPMENT AND MATERIALS

The Contractor shall furnish all of the necessary tools, equipment, and pipeline materials required for the work. All material furnished by the Contractor shall be of the quality specified by the Company in its Construction Specifications (E-8-1).

13. SUPERINTENDENCE BY CONTRACTOR

The Contractor shall assure adequate superintendence of the work by a competent foreman or superintendent (with full authority to act on behalf of Contractor) satisfactory to the Company, who will be on the job at all times when work is in progress.

14. ORDER AND DISCIPLINE

The Contractor shall at all times enforce strict discipline and good order among its employees.

15. INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and any provisions in the Contract, the specifications, or these General Conditions of Contract and Arizona Water Company's Construction Specifications which may appear to give the Company the right to direct the Contractor as to the details of the doing of any work to be performed by the Contractor, or to exercise a measure of control over said work, shall be deemed to mean and shall mean, that the Contractor shall follow the desires of the Company in the results of the work only and not in the means whereby said work is to be accomplished, and the Contractor shall use its own discretion and shall have complete and authoritative control over the work and as to the details of the doing of the work.

16. PUBLIC SAFETY AND CONVENIENCE

Contractor shall at all times conduct its work so as to ensure the least possible obstruction to traffic and other inconvenience to the general public and the residents and businesses in the vicinity of the work, and to ensure the protection of persons and property.

To protect persons from injury and to avoid property damage, Contractor shall provide and maintain adequate barricades as required during the progress of the work and until it is safe to use the property for its intended purpose. The rules and regulations of the local governmental agencies and specific permit requirements respecting safety provisions shall be observed at all times.

In the case of blasting, the Contractor shall exercise extreme caution to protect the general public and personal and public property from harm or damage.

17. PROPERTY PROTECTION

Trees, fences, poles, and all other property shall be protected unless their removal is authorized by the Company. Any property damaged shall be restored by Contractor, at his expense, to Company's satisfaction.

18. RESPONSIBILITY OF CONTRACTOR

The work shall be under Contractor's responsible care and charge. Contractor shall bear all loss and damage whatsoever and from whatsoever cause, except that caused solely by the act of Company, which may occur on or to the work during the fulfillment of the Contract. If any loss or damage occurs, Contractor shall immediately make good any such loss or damage, and in the event of Contractor refusing or neglecting to do so, Company may, or by the employment of some other person, make good any such loss or damage, and the cost and expense of so doing shall be charged to Contractor.

The mention of any specific responsibility or liability imposed upon Contractor shall not be construed as a limitation or restriction of any general liability or duty imposed upon Contractor by the Contract. The reference to any specific duty or liability being made herein is merely for the purpose of explanation.

Contractor alone shall at all times be responsible for the safety of Contractor, Contractor's employees, and its subcontractors' employees, and for Contractor and its subcontractors' plant and equipment and the method of performing the work.

19. ERRORS AND OMISSIONS

If Contractor, in the course of the work, becomes aware of any errors or omissions in the Contract Documents or in the instructions, or if Contractor becomes aware of any discrepancy between the Contract Documents and the physical conditions of the site of the work, Contractor shall immediately inform Company in writing. Any work done by Contractor after such discovery, until authorized by Company, will be done at Contractor's risk.

20. LAWS, REGULATIONS

Contractor shall give all notices required by law and comply with all laws, ordinances, rules and regulations, including, but not limited to, all applicable federal, state, local and other legally required health and safety standards, orders, rules, regulations or other laws, pertaining to the conduct of the work. Contractor shall be liable for, and shall defend and indemnify Company against and hold it harmless from, all violations of any law, ordinance, rule, regulation, standard, or order in connection with work furnished by or on behalf of Contractor. If Contractor observes that the Contract Documents are at variance with any law, ordinance, rule, regulation, standard, or order it shall promptly notify Company in writing and any necessary changes shall be adjusted as provided in the Contract for changes in the work. Contractor shall not perform any work contrary to such laws ordinances, rules, regulations, standards, or orders.

21. PERMITS, FEES AND INSPECTIONS

Permits and licenses necessary for the prosecution of the work, including, but not limited to, any National Pollution Discharge Elimination Systems (NPDES) Permits required by U.S. Environmental Protection Agency or the Arizona Department of Environmental Quality shall be secured, paid for, and complied with by Contractor.

Contractor shall be responsible for its actions and shall abide by all conditions and/or restrictions set forth in the NPDES Permit and any other permit or license required for this project.

Company shall at all times have access to the work whenever it is in preparation or in progress and Contractor shall provide proper facilities for such access and for all inspections. If the Contract Documents, the General Superintendent's instructions, laws, ordinances or any public authority require any work to be inspected or approved, Contractor shall give timely notice of its readiness for inspection.

Inspection of the work shall not relieve Contractor of any of its obligations even if defective work or unsuitable materials may have been previously overlooked by Company and accepted or estimated for payment. If any work is found not in accordance with the Contract Documents, Contractor, at its sole cost and expense, shall promptly make good such defective work.

22. CONSTRUCTION MARKING (PIPELINE ONLY)

Each job shall be marked and/or barricaded by the Contractor in such a manner that the construction is clearly visible at all times.

23. EXTRA WORK AND/OR MATERIALS

Except as otherwise herein provided, no charge for any extra work and/or material will be allowed unless the same has been ordered in writing by the Company's Authorized Representative, and the price stated in such order.

24. CHANGES

The Company shall have the right to make any changes in the work that it may determine to be necessary. If such changes affect the cost of the work, an equitable adjustment shall be negotiated. Changes shall in no way affect or void the obligations of both parties under the original Contract.

25. INSPECTION

All work and material shall be open at all times to inspection and acceptance or rejection by the Company's Inspector. Any work covered up by the Contractor prior to inspection and acceptance by the Company shall be subject to being uncovered at the expense of the Contractor for inspection by the Company. The Contractor shall give the Company reasonable notice of starting new work and shall provide, without extra charge, reasonable and necessary facilities for inspection, even to the extent of taking out portions of finished work. In case any such finished work removed is found satisfactory, however, the actual direct cost of such removal and replacement, plus 15% of such cost, will be paid by the Company; in addition, if completion of the work has been delayed thereby, the Contractor shall be granted a suitable extension of time on account of the additional work involved.

26. DEFECTIVE WORK OR MATERIAL

The Contractor shall remove, at its own expense, any work or material found defective by the Company's Inspector and shall rebuild and replace the same without extra charge; in default thereof, the same may be done by the Company at the Contractor's expense.

27. ASSIGNMENT

Neither party to the Contract may assign the Contract or sublet it in whole or in part without the written consent of the other, nor shall the Contractor assign any monies due or which may become due hereunder without the previous written consent of the Company, nor shall such consent release the Contractor from any of its obligations and liabilities under the Contract.

28. RIGHTS OF VARIOUS INTERESTS

Whenever work that is being done for the Company other than by the Contractor is contiguous to work being done by the Contractor, the respective rights of the various interests involved shall be established by the Company to secure the completion of the various portions of the work in general harmony.

29. SUSPENSION OF WORK

The Company's Authorized Representative may at any time and for any reason suspend all or any portion of the work under the Contract. This right to suspend work shall not be construed as denying the Contractor compensation for actual, reasonable and necessary expenses due to suspension to which it may be entitled.

The Company's Authorized Representative may order the Contractor to suspend any work because of certain conditions, such as inclement weather, or because the

Contractor is in violation of these General Conditions of Contract or the Construction Specifications. It is understood that compensation for expenses will not be allowed for such suspension when ordered by the Company's Authorized Representative on account of such conditions.

30. PROCEDURE OF WORK (PIPELINE ONLY)

All work under the Contract shall be planned and performed so as to cause a minimum of interference with normal vehicular and pedestrian traffic. At no time shall the Contractor completely obstruct the traffic to any business establishment during normal work hours of that business. It shall be the Contractor's responsibility to maintain facilities for ingress and egress to any business establishment. When crossing any street, not more than one-half of the street may be blocked at one time. All federal, state, county and city laws, rules and regulations relating to this subject are to be obeyed.

The Contractor shall complete any portion or portions of the work in such order of time as the Company may require. The Company shall have the right to take possession of and use any completed or partially completed portions of the work. If such prior possession or use increases the cost of or delays the work, the Contractor will be entitled to extra compensation or extension of time or both, as the Company may determine.

31. DISPUTES

All questions or controversies which arise between the Contractor and the Company, under, or in reference to, the Contract, shall be decided by the Company's Authorized Representative and a representative of the Contractor, and their decision shall be final and conclusive upon both parties.

32. CONNECTION TO EXISTING SYSTEM (PIPELINE ONLY)

Unless approved in writing by the Company's Authorized Representative, no tie-in or hot tap on the existing system shall be made unless the Company's Inspector is present. When the tie-in requires the operation of an existing valve or other control equipment, the conditions of Paragraph(s) 30 and 33 shall be complied with. The Contractor shall notify the Company twenty-four (24) hours prior to tie-in as to the exact time the Contractor plans to make tie-in so that the Company's Inspector will have sufficient time to locate valves and make necessary preliminary arrangements for shut down.

33. PLANNED INTERRUPTION OF WATER SERVICE (PIPELINE ONLY)

No valve or other control on an existing Company water system shall be operated for any purpose by the Contractor without approval of the Company's Inspector. All of the Company's water customers whose service is interrupted by a planned interruption, other than in cases of emergency, shall be notified by the Contractor at least twenty-four (24) hours before the planned interruption and advised of the probable time when the service will be restored.

34. EXISTING UTILITY FACILITIES (PIPELINE ONLY)

The Contractor shall notify all known utilities in the area of the work to be performed under the Contract and shall make arrangements to have their facilities marked in accordance with A.R.S. 40-360.022 ("Blue Stake Law"). The Contractor shall be responsible for locating and preserving all marked facilities. Any damages to these marked facilities shall be repaired at the expense of the Contractor.

The Company will pay the cost to relocate its or other structures when such structures are found occupying the physical space of the proposed installation. It is understood that the Contractor will be reimbursed for such work only when written authorization from the Company has been obtained in advance of such work.

35. CLEANING UP

The Contractor shall remove from the Company's property and from all public and private property, at its own expense, all temporary structures, rubbish and waste materials resulting from its operations. In the event Contractor fails to do so, the Company may remove same at the expense of the Contractor.

36. WORKING HOURS (PIPELINE ONLY)

Unless stated to the contrary in the Invitation to Bid and/or so stated on the Construction Drawings, or agreed to by the Company during a Pre-Construction Conference, the Contractor shall not be permitted to perform work on Saturdays, Sundays, or Company holidays, or commence work such as tie-ins that cannot be completed during normal working hours.

37. INDEMNITY

A. The Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Contractor or of any subcontractor, or of any other person or persons, and the violation of any law, ordinance, rule, regulation, standard, or order resulting from or in any manner arising out of or in connection with the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Contractor shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Contractor or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.

B. Contractor shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 37.

C. Contractor further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the well site of any material, substance, or waste, hazardous or non-hazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

38. LIENS

If at any time there shall be evidence of any lien or claim for which the Company might become liable and which is chargeable to the Contractor, the Company shall have the right to retain out of any payment then due or thereafter to become due, an amount sufficient to completely indemnify the Company against such lien or claim. If the Company determines that such lien or claim is valid, the Company may pay and discharge the same, and deduct the amount so paid from any monies which may be or become due and payable to the Contractor.

39. PAYMENT

Upon completion of the installation or construction, the Company will, within thirty (30) days after receipt of proper invoice and labor and material releases, pay the amount due the Contractor. If the Company believes that additional work, such as clean up, is required, it may deduct the total cost of such additional work from the amount to be paid to Contractor.

40. COMPANY'S RIGHT TO TERMINATE CONTRACT: DAMAGES DUE TO DELAY

If the Company finds the Contractor to be in material violation of any section of these General Conditions of Contract, Construction Specifications or Standard Specification Drawings or if the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or when any other cause exists to justify such action, the Company may, without prejudice to any other right or remedy, by written notice to the Contractor, terminate its right to proceed with the work or such part of the work as to which there has been such violation, delay or other cause.

In the event the Contractor's right to proceed is terminated, the Company may take over the work and take possession of, and utilize in completing the work, such materials as may be on the site of the work and necessary therefore and prosecute said work to completion by whatever method it may deem expedient. The Contractor and its sureties shall be liable to the Company for any excess cost caused thereby.

In the event the Contractor's right to proceed with the work is terminated, the Contractor shall not be entitled to receive any further payment until the work is completed or the job is canceled. If the unpaid balance of the Contract price exceeds the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Company.

41. GUARANTEE

The Contractor shall guarantee all labor and workmanship and any materials it installs for a period of one year following the date of completion and acceptance by the Company. If any portion of the work or any of the materials become defective within the guarantee period, the Company will notify the Contractor of such defect. The Contractor must repair any defect within fifteen (15) days of such notification. If repairs are not completed within this time period, the Company may repair the defect, or cause such defect to be repaired, and the cost of such repairs shall be paid by the Contractor. The Company reserves the right to determine which defects are the result of poor labor and workmanship and which are caused by defective materials.

42. LIQUIDATED DAMAGES FOR NON PERFORMANCE: REQUEST FOR EXTENSION(S) OF TIME

Time is of the essence in the Contract. The time period required for completion of the work will be specified in the Contract. The Contractor agrees that the Company will suffer substantial damages in the event the Contractor fails to complete the work within the agreed upon time period. The Contractor and the Company agree that since it would be impracticable or extremely difficult to precisely fix such damages, a reasonable approximation of such actual damages suffered by the Company shall be a sum equal to 0.5% of the Contract price for each working day beyond the time period for completion of the work specified in the Contract.

Request by the Contractor for extensions of the time period shall be in writing and shall not become effective until approved in writing by the Company's Authorized Representative.

43. PAYMENT FOR REQUIRED TESTING

Whenever testing is required by any governmental agency or by the Company to assure conformance of the Contractor's work with the appropriate standard, it will be paid for as follows:

a. For testing required under permits obtained by the Company or testing specifically requested by the Company, the cost of the first test will be paid for by the Company. In the event of failure of the first test, the cost of all further testing associated with the failure will be paid by the Contractor.

b. For testing required under permits obtained by the Contractor, all costs will be paid by the Contractor. Testing of the pipeline for pressure and leakage will be included in the Contract price.

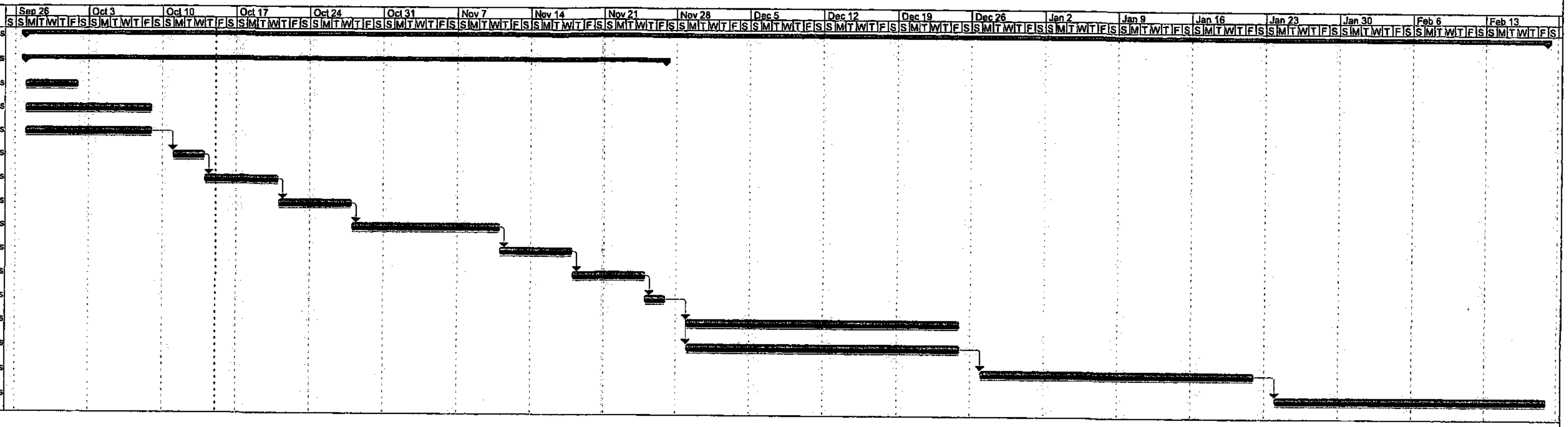
44. CONTRACT DEADLINES AND BONDS REQUIREMENTS

The time limits to be allowed for the completion of any work covered in the Contract shall be established as follows: In the proposal submitted to the Company, in response to the Invitation to Bid, the Contractor shall state the number of calendar days required for completion of the work. The time required will become a part of the Contract. When the Company is ready to proceed with the work, a Commencement Notice will be issued by the Company to the Contractor by mail. The Commencement Notice will allow the time required in the Contract plus ten (10) calendar days and will indicate the final day of the time allowed. The work cannot begin until the Company has received a performance bond and materials payment bond for the Contract price unless the bonds have been waived under the special conditions section of the Contract. The additional ten (10) days is the allowance for time to deliver the Commencement Notice to the Contractor and for the Contractor to return the performance bond and materials payment bond to the Company. Time extensions will be granted if warranted, and only at the time of the delay, thus extending the final day of the time allowed.

If the Company elects not to require a performance bond and a material payment bond for the work, the cost of the bonds will be deducted from the proposed total cost and the Contract will reflect this reduced cost and the bonds requirements will be waived under special conditions of the Contract.

COOLIDGE AIRPORT

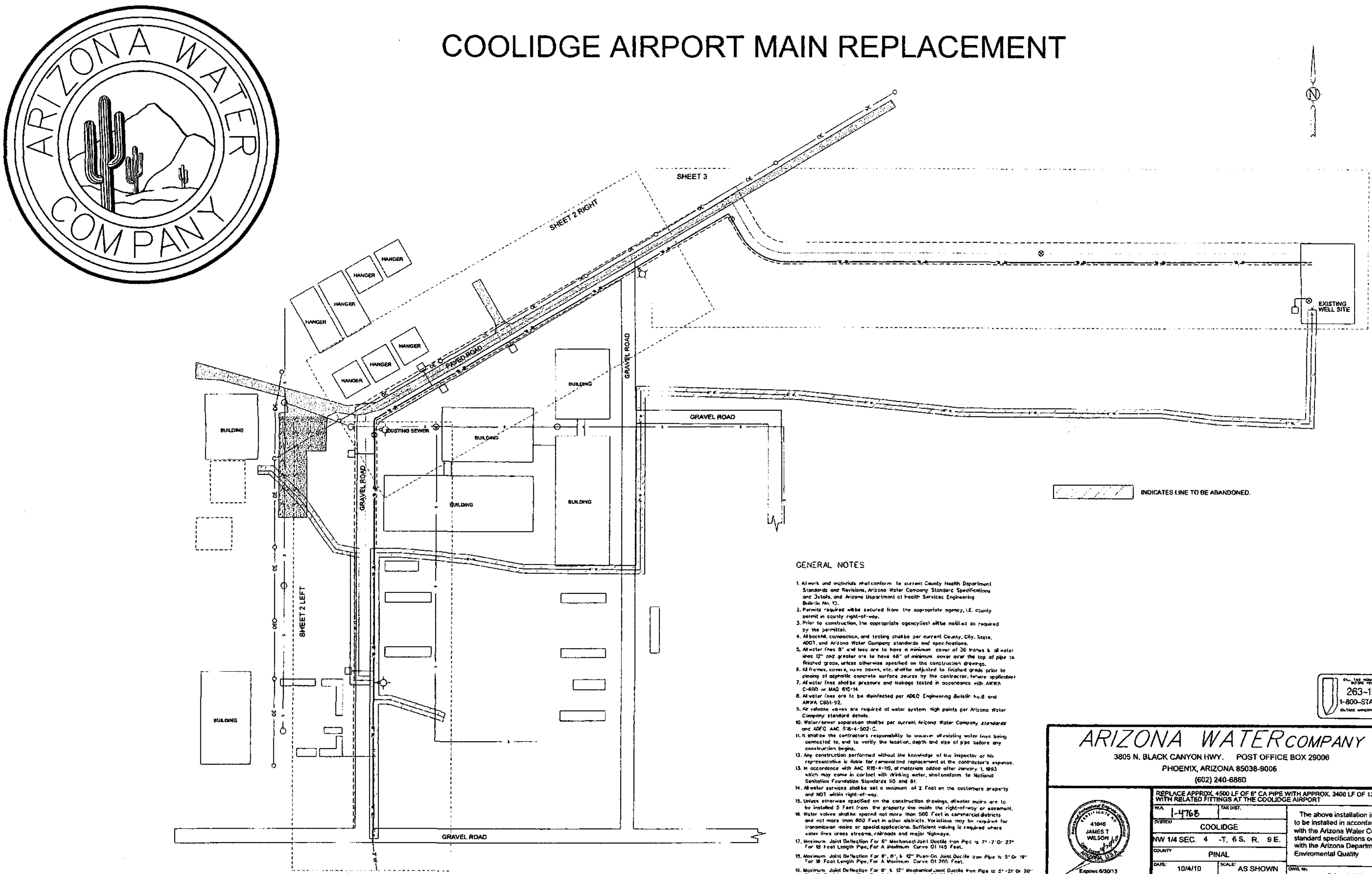
ID	Task Name	Duration
1	Finish Waterline Project	105 days
2	Waterline Design Drawings	45 days
3	Coordinate New Waterline Location W/Field	5 days
4	Acquire Existing Utility As-Builts	10 days
5	Bid R/W Survey	10 days
6	Consulting Agreement for Survey & MOB	3 days
7	Perform R/W Survey	5 days
8	Develop Base Drawings & Set-up Sheets/Details	5 days
9	Preliminary Design Drawings	10 days
10	Preliminary Drawings to Field for Comment	5 days
11	Final Design Drawings	5 days
12	QA/QC	2 days
13	ADEQ ATC	20 days
14	Bid Waterline Construction & Award Contract	20 days
15	Construction	20 days
16	ADEQ AOC	20 days



Project: Waterline Replacement Desig
Date: Fri 10/15/10

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

COOLIDGE AIRPORT MAIN REPLACEMENT



GENERAL NOTES

1. All work and materials shall conform to current County Health Department Standards and Revisions, Arizona Water Company Standard Specifications and Details, and Arizona Department of Health Services Engineering Bulletin No. 10.
2. Permits required will be secured from the appropriate agency, i.e. county permit in county right-of-way.
3. Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).
4. All backfill, compaction, and testing shall be per current County, City, State, ADOT, and Arizona Water Company standards and specifications.
5. All water lines 8" and less are to have a minimum cover of 30 inches & all water lines 12" and greater are to have 48" of minimum cover over the top of pipe to finished grade, unless otherwise specified on the construction drawings.
6. All frames, covers, valve boxes, etc. shall be adjusted to finished grade prior to placing of asphaltic concrete surface course by the contractor. (where applicable)
7. All water lines shall be pressure and leakage tested in accordance with AWWA C-600 or MAG 610-14.
8. All water lines are to be disinfected per ADEQ Engineering Bulletin No.8 and AWWA C651-92.
9. Air release valves are required at water system high points per Arizona Water Company standard details.
10. Water/sewer separation shall be per current Arizona Water Company standards and ADEQ AAC R18-4-502-C.
11. It shall be the contractors responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.
12. Any construction performed without the knowledge of the inspector or his representative is liable for removal and replacement at the contractor's expense.
13. In accordance with AAC R18-4-119, all materials added after January 1, 1993 which may come in contact with drinking water, shall conform to National Sanitation Foundation Standards 60 and 61.
14. All water services shall be set a minimum of 2 Feet on the customers property and NOT within right-of-way.
15. Unless otherwise specified on the construction drawings, all water mains are to be installed 5 Feet from the property line inside the right-of-way or easement.
16. Water valves shall be spaced not more than 500 Feet in commercial districts and not more than 800 Feet in other districts. Variations may be required for transmission mains or special applications. Sufficient valving is required where water lines cross streams, railroads and major highways.
17. Maximum Joint Deflection For 6" Mechanical Joint Ductile Iron Pipe is 7°-7' Or 27" For 18 Foot Length Pipe, For A Maximum Curve Of 145 Feet.
18. Maximum Joint Deflection For 6", 8", & 12" Push-On Joint Ductile Iron Pipe is 5° Or 19" For 18 Foot Length Pipe, For A Maximum Curve Of 205 Feet.
19. Maximum Joint Deflection For 8" & 12" Mechanical Joint Ductile Iron Pipe is 5°-21' Or 20" For 18 Foot Length Pipe, For A Maximum Curve Of 195 Feet.

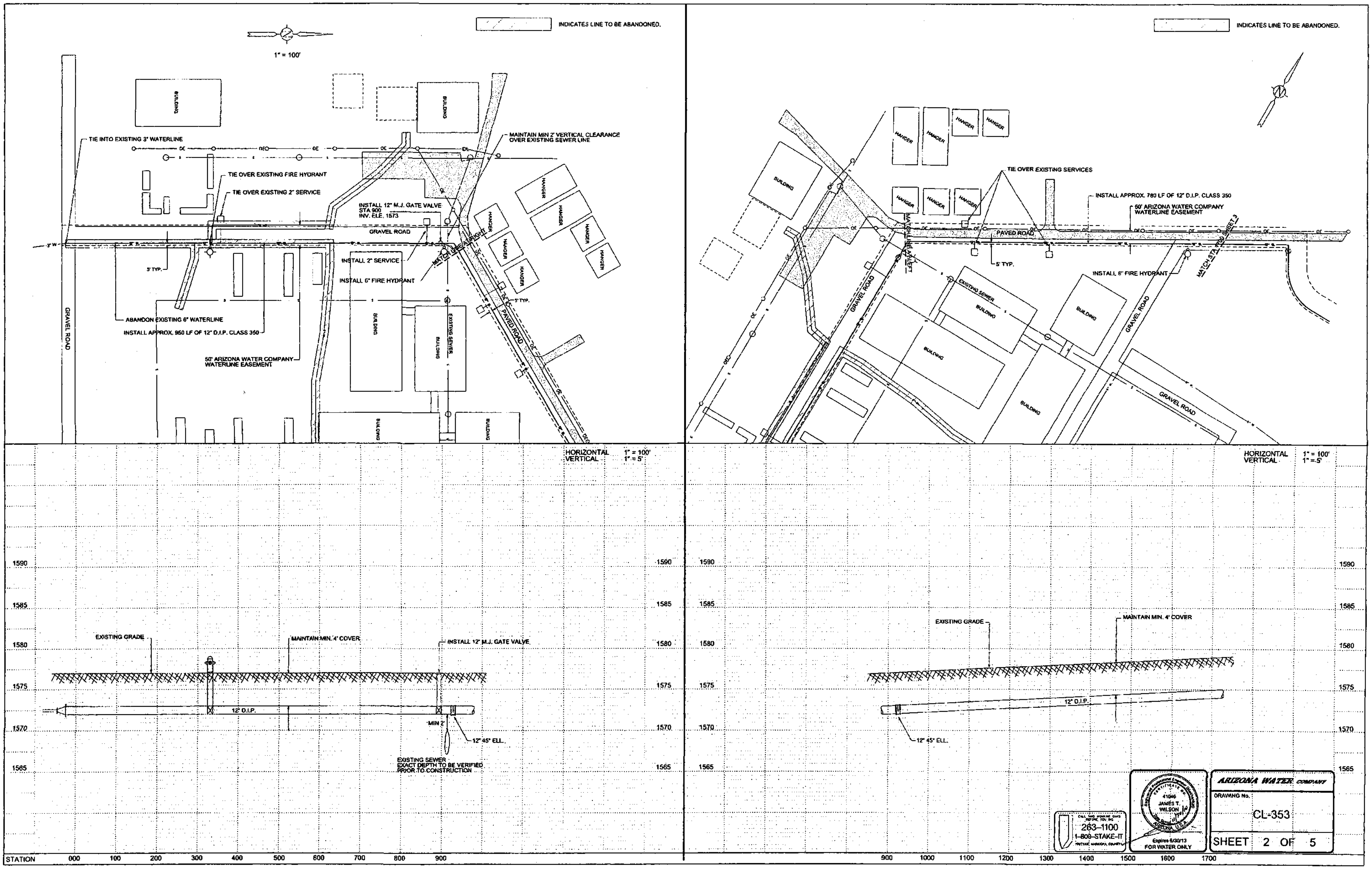
ARIZONA WATER COMPANY
3805 N. BLACK CANYON HWY. POST OFFICE BOX 29006
PHOENIX, ARIZONA 85038-9006
(602) 240-6860

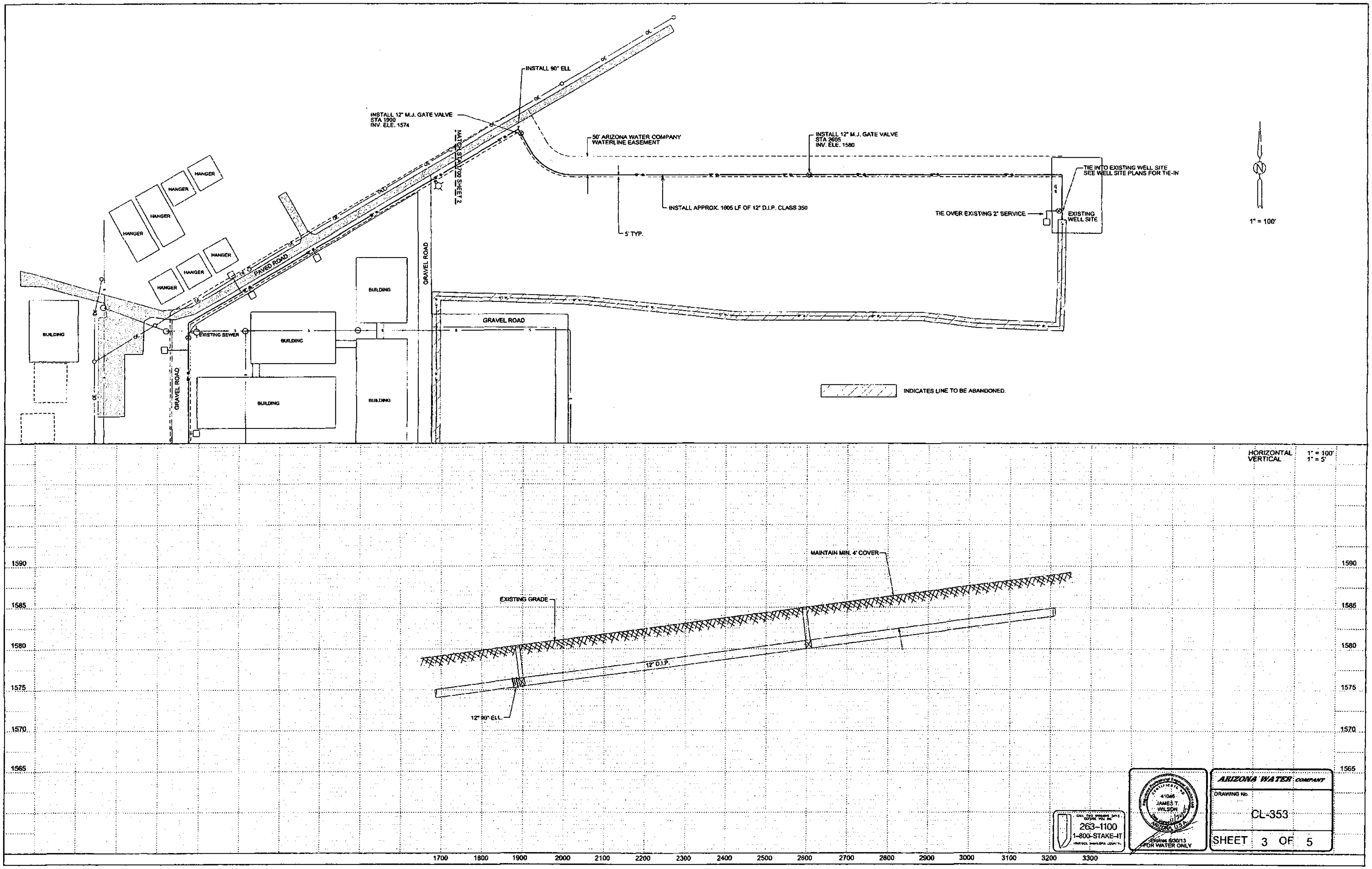
JAMES T WILSON 41046
Expires 6/30/13
FOR WATER ONLY

REPLACE APPROX. 4500 LF OF 6" CA PIPE WITH APPROX. 3400 LF OF 12" DIP WITH RELATED FITTINGS AT THE COOLIDGE AIRPORT

W.A. 1-4768	TAX DIST.	
SYSTEM: COOLIDGE		
NW 1/4 SEC. 4 -T. 6 S. R. 9 E.		
COUNTY: PINAL		
DATE: 10/4/10	SCALE: AS SHOWN	DWG. NO. CL-353
DRAWN BY: JW	SHEET 1 OF 5	

The above installation is to be installed in accordance with the Arizona Water Company standard specifications on file with the Arizona Department of Environmental Quality


INDICATES LINE TO BE ABANDONED.
1" = 100'
BUILDING
TIE INTO EXISTING 3" WATERLINE
TIE OVER EXISTING FIRE HYDRANT
TIE OVER EXISTING 2" SERVICE
INSTALL 12" M.J. GATE VALVE
STA 900
INV. ELE. 1573
GRAVEL ROAD
INSTALL 2" SERVICE
INSTALL 6" FIRE HYDRANT
MAINTAIN MIN 2' VERTICAL CLEARANCE
OVER EXISTING SEWER LINE
HANGER
MATCH LINE A RIGHT
5' TYP.
PAVED ROAD
ABANDON EXISTING 6" WATERLINE
INSTALL APPROX. 950 LF OF 12" D.I.P. CLASS 350
50' ARIZONA WATER COMPANY
WATERLINE EASEMENT
EXISTING SEWER
INDICATES LINE TO BE ABANDONED.
TIE OVER EXISTING SERVICES
INSTALL APPROX. 780 LF OF 12" D.I.P. CLASS 350
50' ARIZONA WATER COMPANY
WATERLINE EASEMENT
MATCH LINE A LEFT
MATCH STA 17+00 SHEET 3
INSTALL 6" FIRE HYDRANT
HORIZONTAL 1" = 100'
VERTICAL 1" = 5'
1590
1585
1580
1575
1570
1565
EXISTING GRADE
MAINTAIN MIN. 4' COVER
INSTALL 12" M.J. GATE VALVE
12" D.I.P.
MIN 2'
12" 45° ELL.
EXISTING SEWER
EXACT DEPTH TO BE VERIFIED
PRIOR TO CONSTRUCTION
STATION
000
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
263-1100
1-800-STAKE-IT
JAMES T.
WILSON
Expires 6/30/13
FOR WATER ONLY
ARIZONA WATER COMPANY
DRAWING No.
CL-353
SHEET 2 OF 5



INSTALL 90° ELL
INSTALL 12" M.J. GATE VALVE
STA 1900
INV. ELE. 1574
MATCH STA 1700 SHEET 2
50' ARIZONA WATER COMPANY
WATERLINE EASEMENT
INSTALL 12" M.J. GATE VALVE
STA 2605
INV. ELE. 1580
INSTALL APPROX. 1605 LF OF 12" D.I.P. CLASS 350
5' TYP.
TIE INTO EXISTING WELL SITE
SEE WELL SITE PLANS FOR TIE-IN
TIE OVER EXISTING 2" SERVICE
EXISTING
WELL SITE
1" = 100'
HANGER
BUILDING
PAVED ROAD
GRAVEL ROAD
EXISTING SEWER
INDICATES LINE TO BE ABANDONED.
HORIZONTAL 1" = 100'
VERTICAL 1" = 5'
MAINTAIN MIN. 4' COVER
EXISTING GRADE
12" D.I.P.
12" 90° ELL
1590
1585
1580
1575
1570
1565
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
3300
263-1100
1-800-STAKE-IT
41046
JAMES T.
WILSON
Expires 6/30/13
FOR WATER ONLY
ARIZONA WATER COMPANY
DRAWING No.
CL-353
SHEET 3 OF 5

E-8-1
CONSTRUCTION SPECIFICATIONS
FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS
DUCTILE IRON

DEFINITIONS

A. Company. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).

B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.

C. Contractor. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.

D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.

E. Contract. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

(1) GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

a. Special compaction and paving for street crossing.
b. Shoring when required because of the trench depth.
c. Closing a trench in those areas where no open trench is allowed overnight.
d. Barricading and traffic control as required.

(2) LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

(3) TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bell holes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.

b. Native material 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

(4) MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5-1/4" main valve opening, three way, 6" Mechanical Joint Shoe, 1-1/2" pentagon operating nut, color - yellow, drain open, open direction - left, 4' or 4'-6" bury depending on application. For pumper and hose nozzle information see below.

(1) One - 4" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San Manuel.)

(2) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)

(3) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NPT (Bisbee only.)

(4) One - 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and Two - 2-1/2" Hose Nozzles, NPT (Miami only.)

(5) One - 3-1/2" Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and Two - 2-1/2" Hose Nozzle, NST (Superior only.)

b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange: Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.

(1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16", Part No. 4" - 4FA-BC, 6" - 6FA-BC, 8" - 8FA-BC, 10" - 10FA-BC, 12" - 12FA-BC, 16" - 16FA-BC.

c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x 3/4" Trim Kit. Trim Kit Part No.: 4" - 282080, 6" - 282082, 8" - 282085, 10" - 282498.

d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12"; Part No. A-2361 sizes 14" through 30", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.

e. TRACER WIRE and WARNING TAPE:

(1) TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.

(2) WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.

f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and 1/2" NPT outlet, cast iron body and top flange; with a 5/64" orifice with stainless steel valve sealing faces and BUNA-N rubber.

g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.

h. MEGALUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.

i. METER BOXES:

(1) Concrete Box with a steel regular lid, Number 1: Tucson specification.

(2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.

j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.

k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

(1) Pacific States Cast Iron Pipe Company
(2) Griffin Pipe
(3) United States Pipe and Foundry Company
(4) American Ductile Iron Pipe
(5) Clow Pipe (McWane, Inc.)

l. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF 61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.

m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil, and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil vinyl tape. No duct tape shall be used.

n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification, Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (1"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications - certified to ISO 9001:1994 / Smith - Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: 3/4", 1" and 2".
Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".
Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)
q. STOP, CURB: Orseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".
Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).
r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.
s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18 8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.
t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12"; T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners; bypass valves are required on 16" - 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".

u. U-BRANCH: Mueller, H15364, 1" male iron pipe by 3/4" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x 3/4" x 15-1/2", straight line.

v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.

w. VAULTS: Utility Vault Company, Chandler, AZ.
(1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.
(2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knock outs and adjustable frame.
(3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port. sizes: 1" x 12", 5/8" x 3/4" x 7", 5/8 x 3/4" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

(5) INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these Specifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system. Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the Company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.
Installation of water line casing shall be per Standard Specification E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

(6) BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

(7) HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.
The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 + or - 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

(8) STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

(9) NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

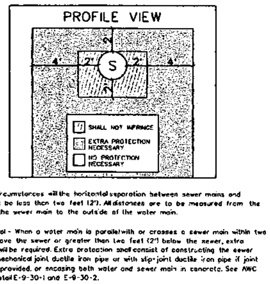
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

(10) PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

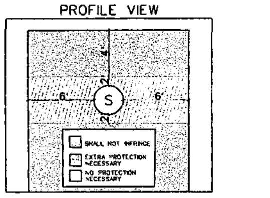
The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.

d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.

e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:

1. Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.

2. Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.

g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.

h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.

i. Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

(11) COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

(12) WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

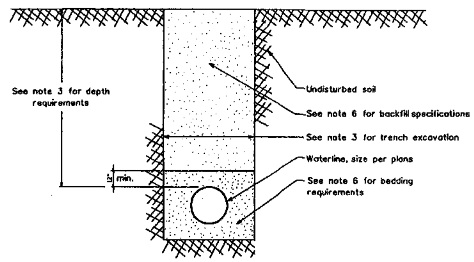
All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System - See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°,7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5°,21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').



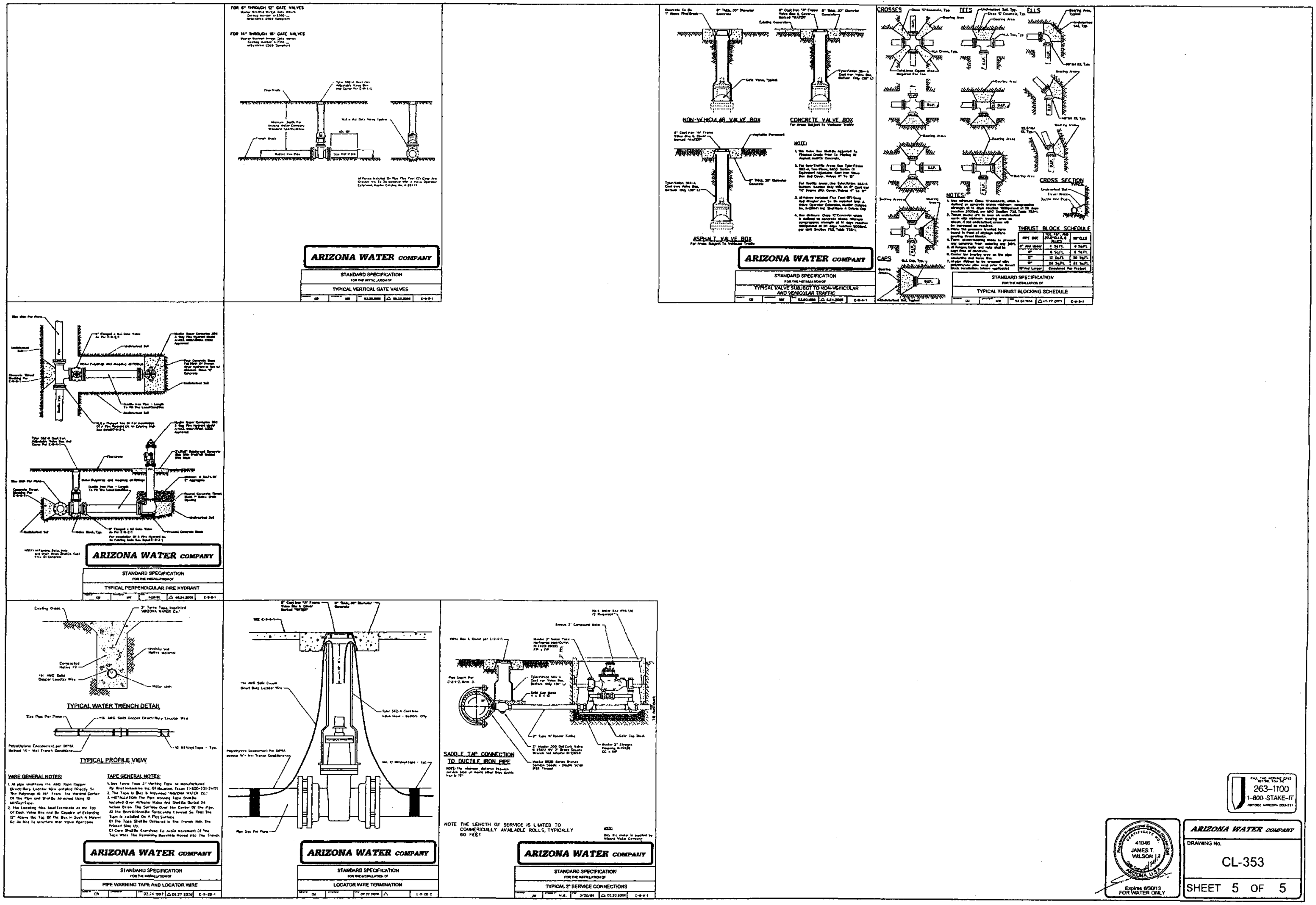
TYPICAL TRENCH DETAIL
Per MAG Detail 601, 601.4.2, 601.4.6

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

41046
JAMES T. WILSON
ARIZONA, U.S.A.
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY

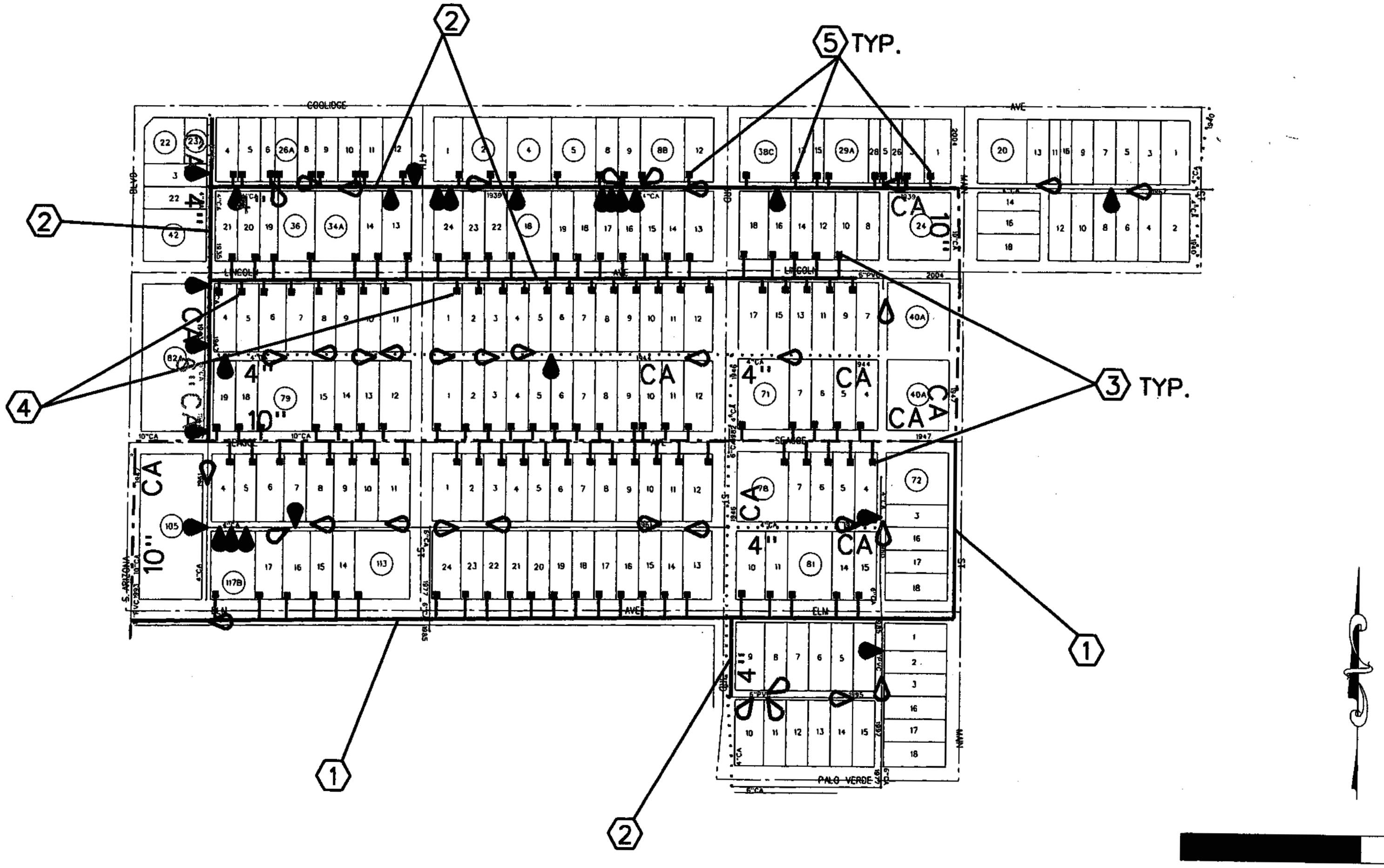
DRAWING No.	CL-353
SHEET 4 OF 5	



FOR 6" THROUGH 12" GATE VALVES
FOR 14" THROUGH 18" GATE VALVES
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL VERTICAL GATE VALVES
NON-VEHICULAR VALVE BOX
CONCRETE VALVE BOX
ASPHALT VALVE BOX
NOTE:
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
CROSSES
TEES
ELLS
CAPS
CROSS SECTION
NOTES:
THRUST BLOCK SCHEDULE
STANDARD SPECIFICATION
TYPICAL THRUST BLOCKING SCHEDULE
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL PERPENDICULAR FIRE HYDRANT
TYPICAL WATER TRENCH DETAIL
TYPICAL PROFILE VIEW
WIRE GENERAL NOTES:
TAPE GENERAL NOTES:
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
PIPE WARNING TAPE AND LOCATOR WIRE
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
LOCATOR WIRE TERMINATION
SADDLE TAP CONNECTION TO DUCTILE IRON PIPE
NOTE THE LENGTH OF SERVICE IS LIMITED TO COMMERCIALLY AVAILABLE ROLLS, TYPICALLY 60 FEET
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL 2" SERVICE CONNECTIONS
263-1100
1-800-STAKE-IT
41046
JAMES T. WILSON
ARIZONA, U.S.A.
Expires 6/30/13
FOR WATER ONLY
ARIZONA WATER COMPANY
DRAWING No.
CL-353
SHEET 5 OF 5

WA1-4772

COOLIDGE OLD TOWN



QUANTITIES LIST

ITEM		QTY.
1	INSTALL 12" PVC	2,200 LF
2	INSTALL 6" PVC	4,000 LF
3	INSTALL LONG SERVICE	95 EA.
4	INSTALL SHORT SERVICE	25 EA.
5	INSTALL SERVICE	26 EA.

PRELIMINARY DRAWING
VALVE AND FIRE HYDRANT LOCATION
TO BE DETERMINED IN PROJECT DESIGN

WATER SERVICES TO BE DOUBLE SERVICES
WHERE POSSIBLE

WATER MAIN REPAIR/REPLACEMENT

SERVICE LINE REPAIR/REPLACEMENT

0 400 800

ARIZONA WATER COMPANY

PROJECT DESCRIPTION

INSTALL 2,200 LF OF 12" C-900 PVC, 4,000 LF OF 6" PVC AND 146 SERVICE CONNECTIONS BETWEEN COOLIDGE AVENUE AND ELM AVENUE.

PROJECT LOCATION

NW 1/4 SEC. 27-T.5S., R.8E.

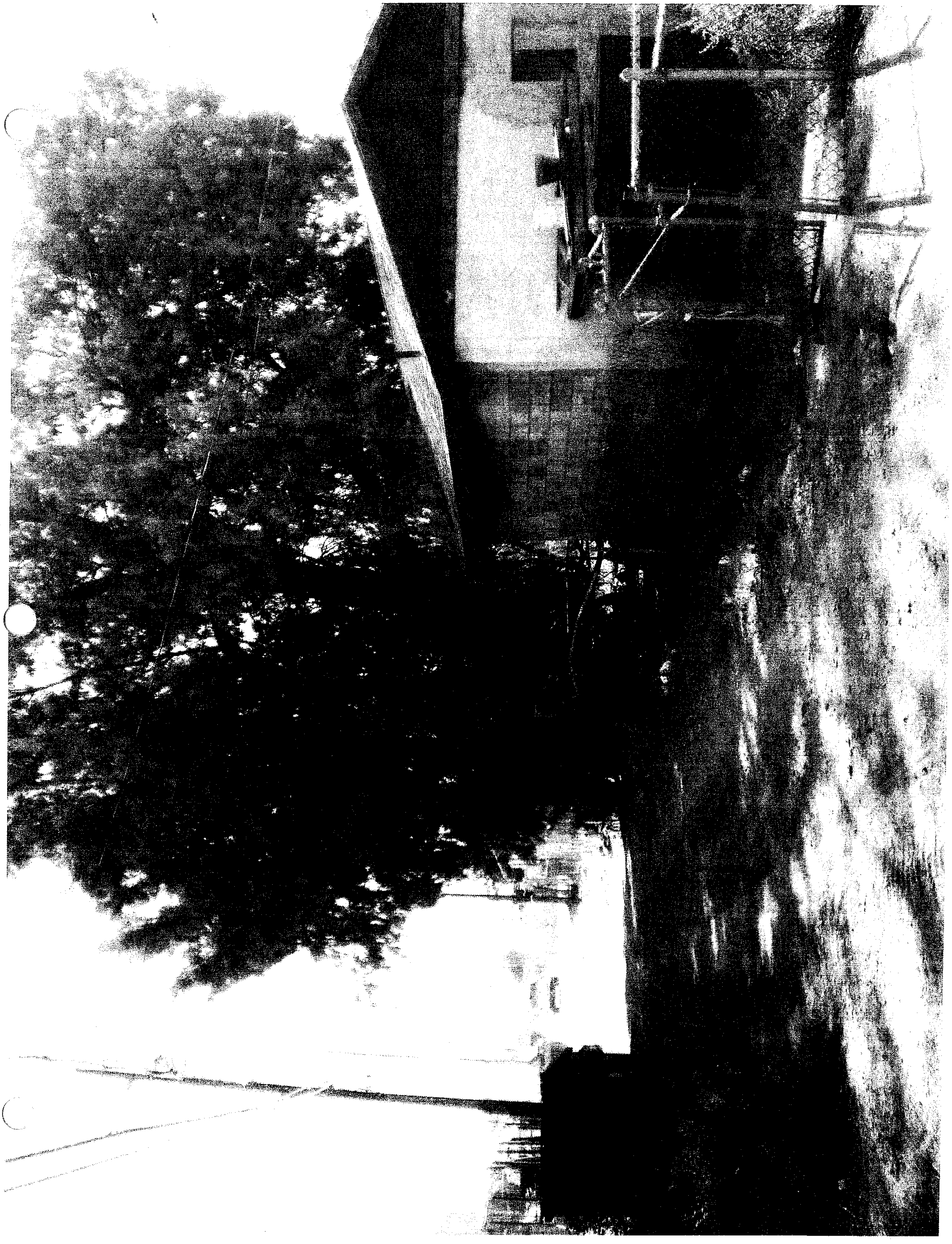
DRAWN BY:	APPROVED BY:	DATE:	REFERENCE MAP:
JS	AH/FS	12/29/2010	MAP E

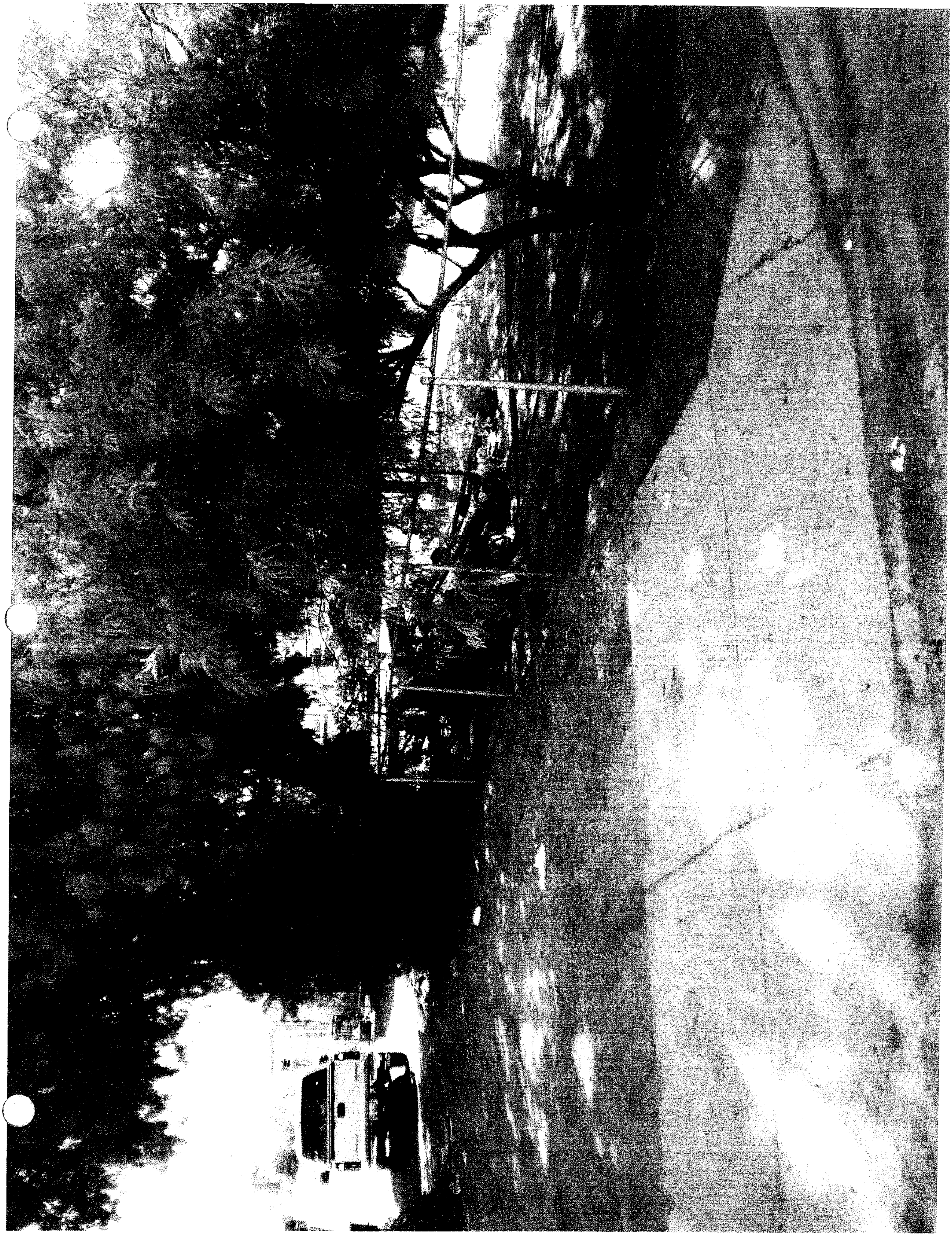
Coolidge Old Town

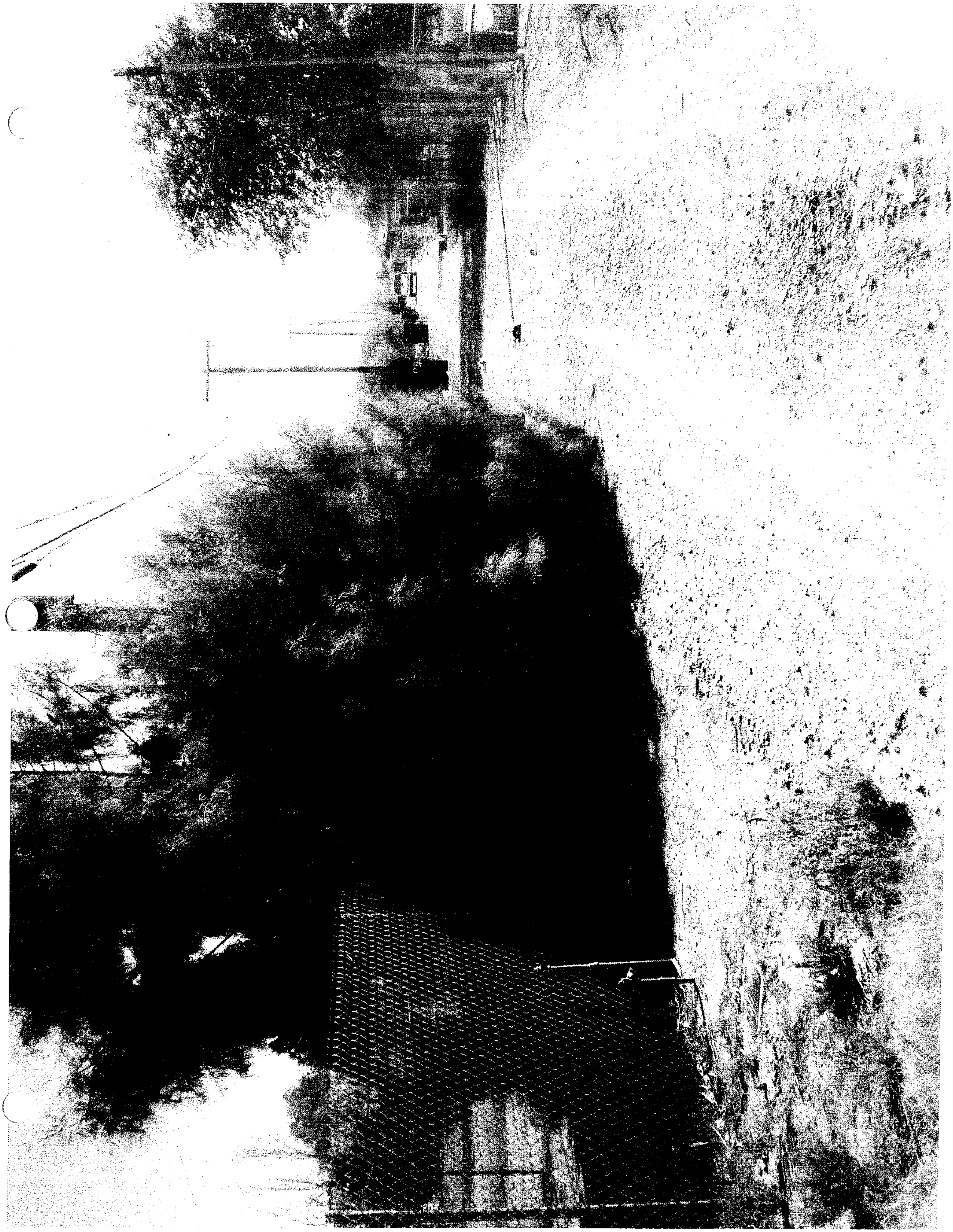
LEAK LOCATION	SECTION	DATE	TYPE
1333 E Arbor Avenue	SW 1/4 Sec 20 T6S R6E	2002	Main Repair
1121 2nd Street	NW 1/4 Sec 28 T6S R6E	2002	Service Replacement
225 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	6/14/2006	Service Replacement
226½ N Palo Verde Avenue	NW 1/4 Sec 27 T5S R8E	2005	Service Repair
229 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2007	Service Replacement
251½ W Elm Avenue	NW 1/4 Sec 27 T5S R8E	2000	Service Repair
265 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2008	Main Repair
280 W Palo Verde Avenue	NW 1/4 Sec 27 T5S R8E	2001	Service Repair
280 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2010	Service Repair
290 W Palo Verde Avenue	NW 1/4 Sec 27 T5S R8E	2004	Service Replacement
300 Block of W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2009	Main Repair
300 Block of W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	3/5/2010	Main Repair
300 Block of W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	3/9/2010	Main Repair
300 Block of W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	3/15/2010	Main Repair
306 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	1/29/2007	Service Replacement
309-315 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2007	Service Replacement
312½ W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2007	Service Repair
318½ W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2008	Service Repair
321 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2009	Service Replacement
339 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	3/5/2010	Main Repair
348 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	5/3/2010	Service Repair
357 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2005	Main Repair
361 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2009	Service Repair
365 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2010	Service Repair
367 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	4/22/2010	Main Repair
375 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	7/15/2009	Main Repair
375 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2010	Main Repair
376 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2010	Service Replacement
393 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2009	Main Repair
400 Block of W Elm Avenue	NW 1/4 Sec 27 T5S R8E	9/22/2009	Main Repair
400 Block of W Elm Avenue	NW 1/4 Sec 27 T5S R8E	9/29/2009	Main Repair
401 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	12/18/2008	Main Repair
401 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2005	Service Repair
408 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2010	Service Repair
411 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	5/3/2010	Service Repair
413 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	4/15/2010	Main Repair
431 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2006	Main Repair
438 W Elm Avenue	NW 1/4 Sec 27 T5S R8E	2006	Main Repair
441 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2010	Service Repair
444 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2004	Service Replacement
447 W Seagoe Avenue	NW 1/4 Sec 27 T5S R8E	2/23/2006	Service Replacement
453 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	6/27/2008	Service Replacement
453 W Coolidge Avenue	NW 1/4 Sec 27 T5S R8E	2000	Service Replacement
457 W Lincoln Avenue	NW 1/4 Sec 27 T5S R8E	2007	Main Repair
464 W Elm Avenue	NW 1/4 Sec 27 T5S R8E	9/25/2009	Main Repair
643 S Arizona Boulevard	NW 1/4 Sec 27 T5S R8E	2004	Main Repair

Coolidge Old Town

LEAK LOCATION	SECTION	DATE	TYPE
660 S Main Street	NW 1/4 Sec 27 T5S R8E	8/16/2010	Service Replacement
663 S 4th Street	NW 1/4 Sec 27 T5S R8E	2007	Service Replacement
716 S Arizona Boulevard	NW 1/4 Sec 27 T5S R8E	1/4/2008	Service Replacement
752 S Main Street	NW 1/4 Sec 27 T5S R8E	9/29/2008	Main Replacement
752 S Main Street	NW 1/4 Sec 27 T5S R8E	6/25/2009	Service Replacement
753 S Main Street	NW 1/4 Sec 27 T5S R8E	2006	Main Repair
753 S Main Street	NW 1/4 Sec 27 T5S R8E	2008	Service Repair
760 S 3rd Street	NW 1/4 Sec 27 T5S R8E	2007	Service Repair
775 S 4th Street	NW 1/4 Sec 27 T5S R8E	2008	Service Repair
801 S Arizona Boulevard	NW 1/4 Sec 27 T5S R8E	9/26/2007	Service Repair
924 N Gilbert Avenue	SE 1/4 Sec 20 T6S R6E	10/7/2009	Service Repair
W Lincoln Avenue & S Arizona Boulevard	NW 1/4 Sec 27 T5S R8E	6/14/2010	Main Repair







ARIZONA WATER COMPANY
WORK AUTHORIZATION

W.A. NUMBER: 1-4772
P.E. NUMBER:
BUDGET ITEM NO.: Special #22
SHEET NO.: 1 of 2

SYSTEM:	PINAL VALLEY		
DIVISION:	PINAL VALLEY	WORK TO START BY:	UPON AUTHORIZATION
TAX CODE:	2108	WORK TO BE FINISHED BY:	WITHIN 130 DAYS

DESCRIPTION OF WORK:

Coolidge Old Town Main Replacement project: Replace approximately 6,040 lf of 4-inch and 200 lf of 6-inch CA pipe with 3,320 lf of 6-inch and 2,200 lf of 12-inch C-900 PVC and tie over 162 service connections. Construct in accordance with attached drawings and/or Arizona Water Company specifications.

FACTORS JUSTIFYING WORK:

The company has experienced several leaks on these waterlines due to age of the pipe and Tamarak tree roots growing into the couplings causing leaks and main breaks contributing to increasing water loss in the Coolidge system.

COST ESTIMATE		AUTHORIZATION	DATE
COST OF WORK:		PREPARED BY:	
MATERIAL	0	James Wilson jw 10/27/10	10/22/10
LABOR	9,974	REVIEWED FOR ESMT/ROW VERIFICATION:	
CONTRACT PORTION	738,300	Charles Briggs CB 10-28-2010	10-22-2010
OVERHEAD	179,586	REVIEWED BY:	
TOTAL AUTHORIZED EXPENDITURES CHARGEABLE TO THIS W.A.	$ 927,860	Mike Loggins ML 10-28-10	10-22-10
FUNDS RECEIVED:		APPROVED BY ENGINEERING:	
CONTRIBUTIONS RECEIVED	0	Fredrick Schneider FS 10-29-10	10-22-10
REFUNDABLE ADVANCES RECEIVED	0	APPROVED BY FINANCE:	
TOTAL CONTRIBUTIONS/ADVANCES	0	Joseph Harris	10/22/10
NET CASH REQUIRED	$ 927,860	SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY PRESIDENT: William M Garfield William Garfield	10-25-10
COMMENTS:		SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY CHAIRMAN: approved via fax M. L. Whitehead	10/27/2010
		CONSTRUCTION RELEASE: **RELEASED TO CONSTRUCTION** **Authorized by FRED SCHNEIDER** **Date** 10/27/10	

AFH

ARIZONA WATE(, COMPANY

W.A. NUMBER:	1-4772
P.E. NUMBER:	
BUDGET ITEM NO.:	Special #22
SHEET NO.:	2 of 2

WORK AUTHORIZATION - DETAIL SHEET

	PLANT PROPERTY ACCOUNT	UNIT DESCRIPTION	QUANTITY	YEAR INSTALLED AND W.A. NUMBER
RETIREMENT PROPERTY UNITS	343	4-inch CA pipe	4260	1939-1947
	343	4-inch CA pipe	1780	1960-1961
	343	6-inch CA pipe	200	1977

PROJECT DESCRIPTION:

Coolidge Old Town Main Replacement project: Replace approximately 6,040 lf of 4-inch and 200 lf of 6-inch CA pipe with 3,320 lf of 6-inch and 2,200 lf of 12-inch C-900 PVC and tie over 162 service connections.

	DESCRIPTION	PLANT PROP ACCT	QUANTITY	UNIT COST	TOTAL
CONTRACT WORK	12" C-900 PVC w/ all related fittings and pavement replacement	343	2,200	$ 65.00	$ 143,000
	6" C-900 PVC w/ all related fittings and pavement replacement	343	3,320	45.00	149,400
	Tie into existing 4" CA with 4" TS*V and 4"x6" reducer	343	7	2,200.00	15,400
	Remove cap and tie into existing 4" CA with 4"x6" reducer	343	2	1,500.00	3,000
	Install new 5/8" service connection and tie over customer line	345	162	2,500.00	405,000
	Replace existing 6" fire hydrant	348	5	4,500.00	22,500
	SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-SHORT	345			
TOTAL CONTRACT WORK					$ 738,300
MATERIALS					
	SERVICE CONNECTIONS: DOUBLE-LONG	345			
	SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS: SINGLE-LONG	345			
	SERVICE CONNECTIONS: SINGLE-SHORT	345			
	METERS	346			
TOTAL MATERIALS					$ -
LABOR					
	TESTING FEE	343	1	$ 1,000.00	1,000
	PERMIT FEE	343	1	1,500.00	1,500
	SURVEY FEE	343	1	4,500.00	4,500
	FIELD INSPECTION	343	1	2,974.00	2,974
	INSTALL SERVICE CONNECTIONS: DOUBLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-SHORT	345			
TOTAL LABOR					$ 9,974
SUBTOTAL - CONTRACT WORK, MATERIALS, AND LABOR					$ 748,274
OVERHEAD					179,586
TOTAL	REFUNDABLE PORTION ☐	NON-REFUNDABLE PORTION ☐		**COST ESTIMATE**	$ 927,860

AFH

AGREEMENT FOR CONSULTING SERVICES BETWEEN
ARIZONA WATER COMPANY AND
HANSEN ENGINEERING & SURVEYING

THIS AGREEMENT is made and entered into on this 15th day of October 2010, by and between Arizona Water Company, an Arizona corporation, hereinafter referred to as "Client", and Hansen Engineering & Surveying, an Arizona corporation hereinafter referred to as "Consultant".

RECITALS

WHEREAS, Client is authorized to and desires to retain Consultant to provide engineering design, post design and construction administration services to locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) within the Right-of-Way as described in Exhibit A attached hereto.

WHEREAS, Consultant is agreeable to providing personnel and facilities necessary to perform the desired services within Client's required time; and

WHEREAS, Client desires to retain Consultant to perform the services in the manner, at the time, and for the compensation set forth herein;

NOW, THEREFORE, Client and Consultant agree as follows:

1. Description of Project.

Client and Consultant agree that Project is as described in Exhibit A, hereto, incorporated by reference herein and entitled "Scope of Work", dated October 14, 2010. If, during the course of Project, Client and Consultant agree to changes in Project, such changes shall be effective only after being incorporated in this Agreement by written amendment, signed by representative of Client and Consultant.

2. Scope of Consultant Services.

Consultant agrees to perform those services described hereafter. Unless modified in writing by both parties, duties of Consultant shall not be construed to exceed those services specifically set forth herein.

a. Basic Services. Consultant agrees to perform those services described in the Scope of Work (the "Services"). Any tasks not specifically described in the Scope of Work will be Additional Services.

b. Additional Services. Client shall pay Consultant all fees and costs incurred in performing Additional Services provided the services were authorized by Client in writing. Unless otherwise agreed in writing, Additional Services shall be compensated in accordance with Consultant's standard billing rates at the time the Additional Services are performed.

c. Litigation Assistance. Unless specifically stated therein, the Scope of Work does not include assistance to support, prepare, document, bring, defend or assist in litigation undertaken or defended by Client. All such services required or requested of the Consultant by Client or any third party (except claims between Client and Consultant) will be reimbursed at Consultant's applicable rates for such litigation services.

3. Responsibilities of Client.

In addition to payment for the Services performed under this Agreement, Client shall:

a. Assist and cooperate with Consultant in any manner necessary and within its ability to facilitate Consultant's performance under this Agreement.

b. Designate in writing a person to act as Client's representative with respect to this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Client's policies, make decisions and execute documents on Client's behalf.

c. Furnish Consultant with all technical data in Client's possession including, but not limited to, maps, surveys, drawings, soils or geotechnical reports and any other information required by or useful to Consultant in performance of the Services under this Agreement.

d. Notify Consultant of any known or potential health or safety hazards existing at or near the project site.

e. Provide access to and/or obtain permission for Consultant to enter upon project related property during normal business hours, whether or not owned by Client, as required to perform and complete the Services.

4. Americans with Disabilities Act.

Any other provision of this Agreement to the contrary notwithstanding, unless otherwise specified in the Scope of Services, Client's contractors shall have sole responsibility as between Client and Consultant for compliance with the Americans With Disabilities Act ("ADA") 42 U.S.C. 12101 et. Seq. and the related regulations. Consultant shall provide client with applicable ADA criteria, which may be required.

5. Authorization and Completion.

In signing this Agreement Client grants Consultant specific authorization to proceed with work as described in Scope of Work and under the terms of this Agreement.

6. Compensation.

a. Amount. For the Services described in Exhibit A, Client agrees to pay, and Consultant agrees to accept compensation in accordance with Exhibit B, attached hereto and incorporated herein. Where Consultant has provided Client with a breakdown of the total compensation into subtasks, such breakdowns are estimates only. Consultant may reallocate compensation between tasks, provided total compensation is not exceeded without the prior written approval of Client.

b. Payment. As long as Consultant has not defaulted under this Agreement, Client shall pay Consultant within thirty (30) days of the date of Consultant's invoices for services performed and reimbursable expenses incurred under this Agreement. If Client has reason to question or contest any portion of any such invoice, amounts questioned or contested shall be identified and notice given to Consultant within thirty (30) days of the date of the invoice. Any portion of any invoice not contested shall be deemed to be accepted and approved for payment and shall be paid to Consultant within thirty (30) days of the date of the invoice. Client agrees to cooperate with Consultant in a mutual effort to resolve promptly any contested portions of Consultant's invoices.

In the event any uncontested portions of any invoice are not paid within thirty (30) days of the date of Consultant's invoice, interest on the unpaid balance shall accrue beginning with the 31st day at the rate of 1.5% per month, and Consultant shall have the right to suspend work per Article XV, Suspension of Work.

7. Responsibility of Consultant.

a. Standard of Care Professional Services.

Subject to the limitations inherent in the agreed scope of work as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Agreement, Consultant shall perform the Services and any Additional Services in accordance with generally accepted standards and practices customarily utilized by competent engineering firms in effect at the time Services and any Additional Services are rendered. Consultant does not expressly or impliedly warrant or guarantee its Services.

b. Reliance upon Information Provided by Others.

If Consultant's performance of services hereunder requires Consultant to rely on information provided by other parties (excepting Consultant's subcontractors), Consultant shall not independently verify the validity, completeness, or accuracy of such information unless otherwise expressly engaged to do so in writing by Client.

c. Consultant's Opinion of Costs.

Client acknowledges that construction cost estimates, financial analyses and feasibility projections are subject to many influences including, but not limited to, price of labor and materials, unknown or latent conditions of existing equipment or structures, and time or quality of performance by third parties. Client acknowledges that such influences may not be precisely forecasted and are beyond the control of Consultant and that actual costs incurred may vary substantially from the estimates prepared by Consultant. Consultant does not warrant or guarantee the accuracy of construction or development cost estimates, however, Consultant agrees to exercise its best Professional Judgment in rendering its opinions.

d. Construction Phase Services.

1. Consultant's Activities at Construction Site. The presence of Consultant's personnel at a construction site, whether as on-site representative, resident engineer, construction manager, or otherwise, does not make Consultant responsible for those duties that belong to Client and/or construction contractors or others, and does not relieve construction contractors or others of their obligations, duties, and responsibilities, including, but not limited to, construction methods, means, techniques, sequences, and procedures necessary for completing all portions of the construction work in accordance with the contract documents, any health or safety programs and precautions required by such construction work, and any compliance with applicable laws and regulations. Any inspection or observation of the contractor's work is for the purpose of determining that the work is proceeding in conformance with the intent of the project specifications and contract documents. Consultant has no authority to exercise control over any construction contractor in connection with their work or health or safety programs and precautions. Except to protect Consultant's own personnel and except as may be expressly required elsewhere in the Scope of Work, Consultant has no duty to inspect, observe, correct, or report on health or safety deficiencies of the construction contractor.

2. Shop Drawing and Submittal Review. If required by Consultant's Scope of Services, Consultant shall review shop drawings or other contractor submittals for general conformance with the intent of the contract documents. Except for services completed under direct contract to Consultant, Consultant shall not be required to verify dimensions, to engineer contractor's shop drawings or submittals, nor to coordinate shop drawings or other submittals with other shop drawings or submittals provided by contractor.

3. Record Drawings. Record drawings, if required, will be prepared, in part, on the basis of information compiled and furnished by others, and may not always represent the exact location, type of various components, or exact manner in which the Project was finally constructed. Except for services completed under direct contract to Consultant, Consultant is not responsible for any errors or omissions in the information from others that are incorporated into the record drawings.

e. Scope of Work.

1. Before preparing the scope of work, Consultant specifically acknowledges and agrees that it has inspected and familiarized itself with Client's project site. The Consultant has received, or had the opportunity to inquire about and/or request all relevant information concerning the Scope of Work from Client or any other source

Consultant deems necessary. The Scope of Work has been prepared by the Consultant and to the best of its knowledge includes all applicable work required to successfully complete project.

8. Asbestos/Hazardous Material.

Consultant and Consultant's subcontractors shall have no responsibility for the discovery, handling, removal, or disposal of, or exposure of persons to asbestos or hazardous or toxic materials that are present in any form at the project site. Professional services related to or in any way connected with the investigation, detection, abatement, replacement, use, specification, or removal of products, materials, or processes containing asbestos or hazardous or toxic materials are beyond the scope of this Agreement.

In the event Consultant encounters asbestos or hazardous materials at the jobsite, Consultant may, at its option and without liability for damages, suspend the performance of services on the Project until such time as Client and Consultant mutually agree on an amendment to this Agreement to address the issue, or Client retains another specialist consultant or contractor to identify, classify, abate and/or remove the asbestos and/or hazardous materials.

9. Consultant's Work Product.

a. Scope.

Consultant's work product which is prepared solely for the purposes of this Agreement, including, but not limited to, drawings, test results, recommendations and technical specifications, whether in hard copy or electronic form, shall become the property of Client when Consultant has been fully compensated as set forth herein. Consultant may keep copies of all work product(s) for its records.

Consultant and Client recognize that Consultant's work product submitted in performance of this Agreement is intended only for the project described in this Agreement. Client's alteration of Consultant's work product or its use by Client for any other purpose shall be at Client's sole risk.

b. Electronic Copies.

If requested, solely as an aid and accommodation to Client, Consultant may provide copies of its work product documents in computer-readable media ("electronic copies", "CADD"). These documents will duplicate the documents provided as work product, but will not bear the signature and professional seals of the registered professionals responsible for the work. Client is cautioned that the accuracy of electronic copies and CADD documents may be compromised by electronic media degradation, errors in format translation, file corruption, printing errors and incompatibilities, operator inexperience and file modification. Consultant will maintain the original copy, which shall serve as the official, archived record of the electronic and CADD documents.

10. <u>Indemnification.</u>

a. The Consultant shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Consultant or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Consultant or of any subcontractor, or of any other person or persons, and the violation of any law, ordinance, rule, regulation, standard, or order resulting from, or in any manner arising out of, or in connection with, the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Consultant shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Consultant or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.

b. Consultant shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 36.

c. Consultant further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the project site of any material, substance, or waste, hazardous or nonhazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

11. <u>Consultant's Insurance.</u>

Consultant shall procure and maintain the following minimum insurance:

a. Commercial general liability insurance, including personal injury liability, blanket contractual liability and broad-form property damage liability coverage. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.

b. Automobile bodily injury and property damage liability insurance covering owned, non-owned, rented, and hired cars. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.

c. Statutory workers' compensation and employer's liability insurance as required by state law.

d. Professional liability insurance. The policy limit shall be not less than $1,000,000.

Consultant shall either require each of its subconsultants to procure and to maintain the insurance specified in this section or insure its subconsultants in the Consultants own policy, in like amounts.

Client shall be named as additional insured on polices 1 and 2 above. Upon execution of this Agreement, Consultant will provide a certificate of insurance to Client. Consultant will keep the certificate current at all times while this Agreement is in effect. The Consultant will provide a 30-day written notice in the event the above policies are cancelled.

12. <u>Confidentiality.</u>

Consultant agrees it will maintain the confidentiality of all material it receives from Client and will not disclose, distribute, or publish to any third party such information without the prior permission of Client. Notwithstanding the foregoing, Consultant shall have no confidentiality obligation with respect to information that:

a. becomes generally available to the public other than as a result of disclosure by Consultant or its agents or employees;

b. was available to Consultant prior to its disclosure by Client;

c. becomes available to Consultant from a third party who is not, to the knowledge of Consultant, bound to retain such information in confidence.

In the event Consultant is compelled by subpoena, court order, or administrative order to disclose any confidential information, Consultant shall promptly notify Client and shall cooperate with Client prior to disclosure so that Client may take necessary actions to protect such confidential information from disclosure.

13. <u>Subcontracts.</u>

Consultant shall be entitled, to the extent determined appropriate by Consultant, to subcontract any portion of the services to be performed under this Agreement.

14. Suspension of Work.

Work under this Agreement may be suspended as follows:

a. By Client. By written notice to Consultant, Client may suspend all or a portion of the Work under this Agreement if unforeseen circumstances beyond Client's control make normal progress of the Work impracticable.

b. By Consultant. By written notice to Client, Consultant may suspend the work if Consultant reasonably determines that working conditions at the Site (outside Consultant's control) are unsafe, or in violation of applicable laws, or in the event Client has not made timely payment in accordance with Article VI, compensation

15. Termination of Work.

a. This Agreement may be terminated by Client as follows: (1) for its convenience on thirty (30) days' notice to Consultant, or (2) for cause, if Consultant materially breaches this Agreement through no fault of Client and Consultant neither cures such material breach nor makes reasonable progress toward cure within fifteen (15) days after Client has given written notice of the alleged breach to Consultant.

b. This Agreement may be terminated by Consultant as follows: (1) for cause, if Client materially breaches this Agreement through no fault of Consultant and Client neither cures such material breach nor makes reasonable progress toward cure within thirty (30) days after Consultant has given written notice of the alleged breach to Client.

c. Payment upon Termination. In the event of termination, Consultant shall perform such additional work as is reasonably necessary for the orderly closing of the work. Consultant shall be compensated for all work performed prior to the effective date of termination, plus work required for the orderly closing of the work, including: (1) authorized work performed up to the termination date plus termination expenses, including all labor and expenses, at Consultant's standard billing rates, directly attributable to termination; (2) all efforts necessary to document the work completed or in progress; and (3) any termination reports requested by Client.

16. Assignment.

This Agreement is binding on the heirs, successors, and assigns of the parties hereto. Except as otherwise set forth under Article VIII, Assignment of Tasks to Affiliates, this Agreement may not be assigned by Client or Consultant without prior, written consent of the other.

17. No Benefit for Third Parties.

The services to be performed by Consultant are intended solely for the benefit of Client, and no benefit is conferred on, nor contractual relationship established with any person or entity not a party to this Agreement. No such person or entity shall be entitled to rely on Consultant's services, opinions, recommendations, plans, or specifications without the express written consent of Consultant. No right to assert a claim against the Consultant, its officers, employees, agents, or consultants shall accrue to the construction Contractor or to any subcontractor, supplier, manufacturer, lender, insurer, surety, or any other third party as a result of this Agreement or the performance or nonperformance of the Consultant's services hereunder.

18. Force Majeure.

Consultant and Client shall not be responsible for delays caused by circumstances beyond their reasonable control, including, but not limited to: (1) strikes, lockouts, work slowdowns or stoppages, or accidents; (2) acts of God; (3) failure of Client to furnish timely information or to approve or disapprove Consultant's instruments of service promptly; and (4) faulty performance or nonperformance by Consultant or Client, Client's or Consultant independent consultants or contractors, or governmental agencies. Consultant and Client shall not be liable for damages arising out of any such delay, nor shall the Consultant or Client be deemed to be in breach of this Agreement as a result thereof.

19. Integration.

This Agreement represents the entire understanding of Client and Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties.

20. Severability.

If any part of this Agreement is found unenforceable under applicable laws, such part shall be inoperative, null, and void insofar as it conflicts with said laws, but the remainder of this Agreement shall be in full force and effect.

21. Choice of Law/Jurisdiction.

This Agreement shall be administered and interpreted under the laws of the State of Arizona Jurisdiction of litigation arising from the Agreement shall be in The State of Arizona.

22. Attorneys' Fees.

In the event any claim, controversy, or legal action arises under this Agreement, the prevailing party shall be entitled to recover from the other party all attorneys' fees, costs, expenses and other fees incurred by the prevailing party.

23. Notice Provisions.

Notices concerning this Agreement shall be in writing and sent by certified mail or by courier (such as Federal Express), or by hand-delivery addressed as follows:

To the Company: Arizona Water Company
3805 North Black Canyon Highway
Phoenix, Arizona 85015-5351
Attention: President

or

Arizona Water Company
Post Office Box 29006
Phoenix, AZ 85038-9006
Attention: President

To Consultant: Hansen Engineering & Surveying

115 S. Main Street

Coolidge, AZ 85228

Attention: President

Either party may change its address for purposes of this Section by giving written notice of such change of address to the other party

24. Authorization.

The persons executing this Agreement on behalf of the parties hereto represent and warrant that the parties have all legal authority and authorization necessary to enter into this Agreement, and that such persons have been duly authorized to execute this Agreement on their behalf.

IN WITNESS WHEREOF, each of the parties hereto has caused this instrument to be executed by their respective duly authorized officers as of the date first written above.

HANSEN ENGINEERING & SURVEYING an Arizona corporation	**ARIZONA WATER COMPANY,** an Arizona corporation
By: [signature]	By: [signature] 10/15/10
Its: Pres.	Its: REAL PROPERTY SPECIALIST

W:\01-AGREEMENTS, DRAFTS, LTRS & DOCS\CONSULTING AGREEMENTS\HANSEN ENGRNG_SURVEYING\101310.DOCX
CB:JRC 1/31/2008 11:01 AM

HANSEN
ENGINEERING & SURVEYING
115 S. Main St. Coolidge, AZ 85228
Professional Engineers & Surveyors
Phone: (520) 723-3261
Fax: (520) 723-3739

Exhibit A

REVISED 10-14-10
Proposal For Survey

Client: Arizona Water Company
Attn: Charles Biggs
Project: Coolidge / Valley Farms Corridor Topo
Date: October 14, 2010

Scope of Services

Project Corridor Survey
Coolidge-Valley Farms, Arizona

COOLIDGE – Exhibit 1

Locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) within the Right-of-Way of the following roads:

- Coolidge Avenue, from Arizona Boulevard to Main Street, South of the R/W centerline
- Lincoln Avenue, from Arizona Boulevard to Main Street, South of the R/W centerline
- Elm Avenue, from Arizona Boulevard to Main Street, The entire width of R/W
- Main Street, from Elm Avenue to Seagoe Avenue, West of the R/W centerline on Main
- Third Street, from Palo Verde Avenue to Elm Avenue, The entire width of R/W

The survey will also show all features 10 feet beyond the Right-of-Way, specifically: Locate all above-ground utilities (including, but not limited to: valves, power poles, guy lines, junction boxes, ditches, canals, etc.) and locate and identify all utility bluestake markings (for underground utilities).

VALLEY FARMS – Exhibit 2

Locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) along the Roadway of the following road:

- Moore Road, from Vah Ki Inn Road to McGee Road, The entire width.
- Vah Ki Inn Road, from AWC well site, East to McGee Road, North of the R/W centerline of Vah Ki Inn

The survey will also show all features 10 feet beyond the Roadway, specifically: Locate all above-ground utilities (including, but not limited to: valves, power poles, guy lines, junction boxes, ditches, canals etc.) and locate and identify all utility bluestake markings (for underground utilities).

NOTE: Moore Road is described by centerline and no width is defined (Book 84 of Deeds, Page 164). For the purposes of the survey, the primary survey area will be the width of the road as it exists. The secondary survey area will be 10 feet beyond the width of the road on each side.

ADDITIONAL INFORMATION

Project Location: Coolidge: Northwest quarter Section 27, T.5S.,R.8E.

Project Location: Valley Farms: Northwest quarter Section 20, T.5S.,R.9E.

Deliverables:

1 complete printed set of the survey in its entirety on bond paper
1 compact disc with the electronic files of the survey in its entirety in AutoCAD format

Professional Engineers & Surveyors
HANSEN
ENGINEERING & SURVEYING
115 S. Main St. Coolidge, AZ 85228
Phone: (520) 723-3261
Fax: (520) 723-3739

Exhibit B

Proposal For Survey

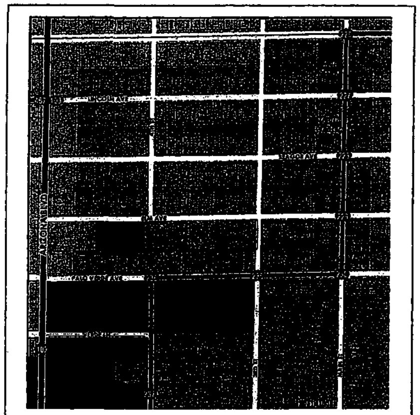
Client: Arizona Water Company
Attn: Charles Biggs
Project: Coolidge / Valley Farms Corridor Topo
Date: October 14, 2010

<u>Project Fee</u>

Total fee for services described in Exhibit A	$7,400.00

<u>Standard Time & Material Rates</u>

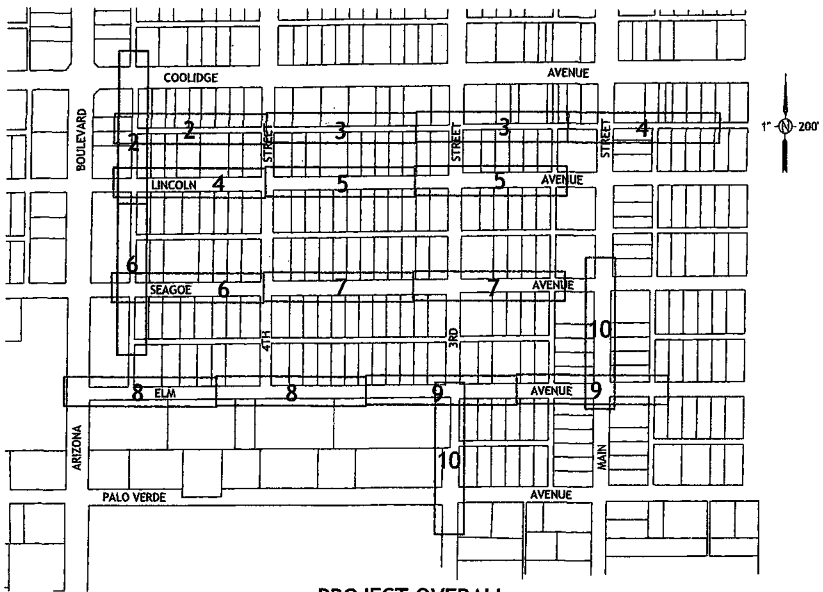
1MC	= $ 85/Hr
2MC	= $100/Hr
3MC	= $135/Hr
Auto Cad 1	= $ 55/Hr
Auto Cad 2	= $ 60/Hr
Sr. Field Tech	= $ 70/Hr
Engineering Tech 1	= $ 60/Hr
Engineering Tech 2	= $ 70/Hr
Land Surveyor	= $100/Hr
Engineer	= $100/Hr



VICINITY MAP
N.T.S.

REPLACE 6,200 L.F. OF 3" & 4" WITH 6,400 L.F. OF 6" & 12" C-900 P.V.C. IN AN ALLEY, ON LINCOLN, ELM, 3RD, AND MAIN STREETS

COOLIDGE,AZ



PROJECT OVERALL

GENERAL NOTES

1. All work and materials shall conform to current County Health Department Standards and Revisions, Arizona Water Company Standard Specifications and Details, and Arizona Department of Health Services Engineering Bulletin No. 10.
2. Permits required will be secured from the appropriate agency, I.E. county permit in county right-of-way.
3. Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).
4. All backfill, compaction, and testing shall be per current County, City, State, ADOT, and Arizona Water Company standards and specifications.
5. All water lines 8" and less are to have a minimum cover of 36 Inches & all water lines 12" and greater are to have 48" of minimum cover over the top of pipe to finished grade, unless otherwise specified on the construction drawings.
6. All frames, covers, valve boxes, etc. shall be adjusted to finished grade prior to placing of asphaltic concrete surface course by the contractor. (where applicable)
7. All water lines shall be pressure and leakage tested in accordance with AWWA C-600 or MAG 610-14.
8. All water lines are to be disinfected per ADEQ Engineering Bulletin No.8 and AWWA C651-92.
9. Air release valves are required at water system high points per Arizona Water Company standard details.
10. Water/sewer separation shall be per current Arizona Water Company standards and ADEQ AAC R18-4-502-C.
11. It shall be the contractors responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.
12. Any construction performed without the knowledge of the inspector or his representative is liable for removal and replacement at the contractor's expense.
13. In accordance with AAC R18-4-119, all materials added after January 1, 1993 which may come in contact with drinking water, shall conform to National Sanitation Foundation Standards 60 and 61.
14. All water services shall be set a minimum of 2 Feet on the customers property and NOT within right-of-way.
15. Unless otherwise specified on the construction drawings, all water mains are to be installed 5 Feet from the property line inside the right-of-way or easement.
16. Water valves shall be spaced not more than 500 Feet in commercial districts and not more than 800 Feet in other districts. Variations may be required for transmission mains or special applications. Sufficient valving is required where water lines cross streams, railroads and major highways.
17. Maximum Joint Deflection For 6" Mechanical Joint Ductile Iron Pipe Is 7°-7' Or 27" For 18 Foot Length Pipe, For A Maximum Curve Of 145 Feet.
18. Maximum Joint Deflection For 6", 8", & 12" Push-On Joint Ductile Iron Pipe Is 5° Or 19" For 18 Foot Length Pipe, For A Maximum Curve Of 205 Feet.
19. Maximum Joint Deflection For 8" & 12" Mechanical Joint Ductile Iron Pipe Is 5°-21' Or 20" For 18 Foot Length Pipe, For A Maximum Curve Of 195 Feet.

ADEQ APPROVAL

FILE No. ______

DATE ______

BASIS OF BEARING

The North line of Section 27, Township 5 South, Range 8 East, G.S.R.B.&M.

N89°15'E

G.L.O. Plat 1635 2/12/1930

BENCHMARK

NGS Database
Coolidge CORS ARP
ID= AZCL
PID= DH4132
NAD83 32°59'01.16842N
111°30'55.28041W
NAVD88= 1436.2 Feet

SHEET INDEX

Sheet 1 - Cover Sheet
Sheet 2 - Pipeline
Sheet 3 - Pipeline
Sheet 4 - Pipeline
Sheet 5 - Pipeline
Sheet 6 - Pipeline
Sheet 7 - Pipeline
Sheet 8 - Pipeline
Sheet 9 - Pipeline
Sheet 10 - Pipeline
Sheet 11 - Construction Specs.
Sheet 12 - Details

The installation shown is to be installed in accordance with the Arizona Water Company standard specifications on file with the Arizona Department of Environmental Quality

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
OUTSIDE MARICOPA COUNTY

ADOT Project F-019-1(3)

W.A. 1-4772	DATE 10.07.2010
SYSTEM	COOLIDGE
LOCATION:	NW 1/4 SEC.27-T5S.,R.8E.
COUNTY	Pinal
SCALE:	Per Plan
DRAWN BY: CB	TAX DIST. 2108

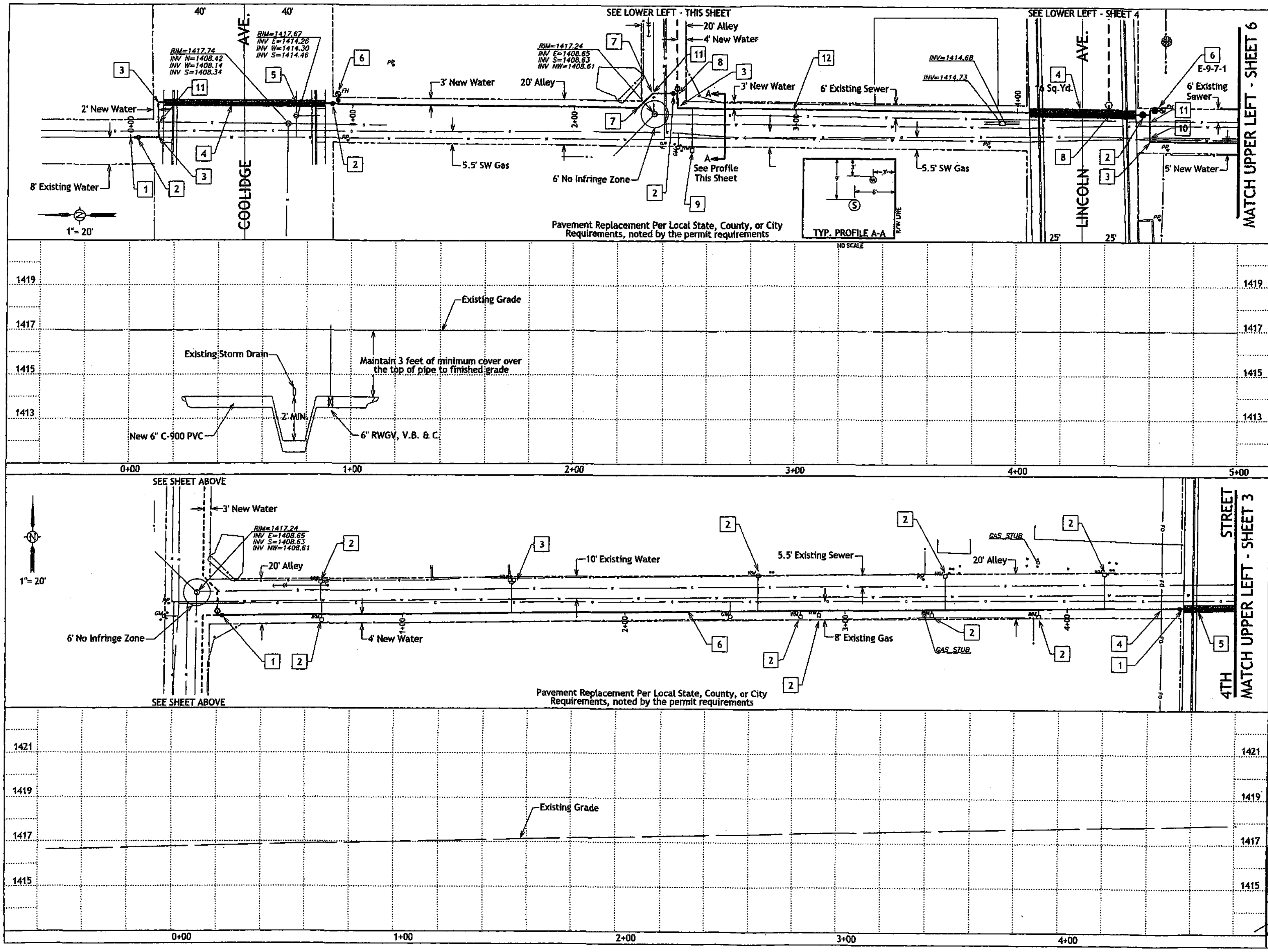
41048
JAMES T. WILSON
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY

3805 N. BLACK CANYON HWY • POST OFFICE BOX 29006
PHOENIX, AZ 85015 PHOENIX, AZ 85038
(602) 240-6860

DESCRIPTION: REPLACE 6,200 L.F. OF 3" & 4" WITH 6,400 L.F. OF 6" & 12" C-900 P.V.C. IN AN ALLEY, ON LINCOLN, ELM, 3RD, AND MAIN STREETS

DWG. NUMBER: CL-0354 SHEET: 1 of 12



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Tie Into Existing 4" w/4" Transition Coupling, 6"x4" Reducer
2. 6" RWGV, V.B. & C.
3. 6" 90° MJ Ell, w/Megalugs
4. Sidewalk, Curb, Gutter, and/or AC Pavement Replacement (25 Sq.Yd)(16 Sq.Yd)
5. Vertical Realignment Under Existing Storm Drain - 2 Foot Minimum Separation
6. Tie-Over Existing Fire Hydrant Assembly 6" MJ Tee, 6" RWGV, V.B.&C., Megalugs
7. 6" 45° MJ Ell w/Megalugs
8. 6" MJ Tee, w/Megalugs
9. Tie-over Existing Water Service, Typical
10. Gas Main Crossing - Use Extreme Caution!!
11. Water Crosses Over Sewer. Minimum 2 Foot Separation
12. Install 520 LF of 6" C-900 PVC Water Main & Related Fittings

CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. 6" RWGV, V.B. & C.
2. Tie-over Existing Water Service, Typical Single
3. Tie-over Existing Water Service, Typical Double
4. Fiber Optic Line Crossing - Use Extreme Caution!!
5. Sidewalk, Curb, Gutter, and AC Pavement Replacement (8 Sq.Yd)
6. Install 475 LF of 6" C-900 PVC Water Main & Related Fittings

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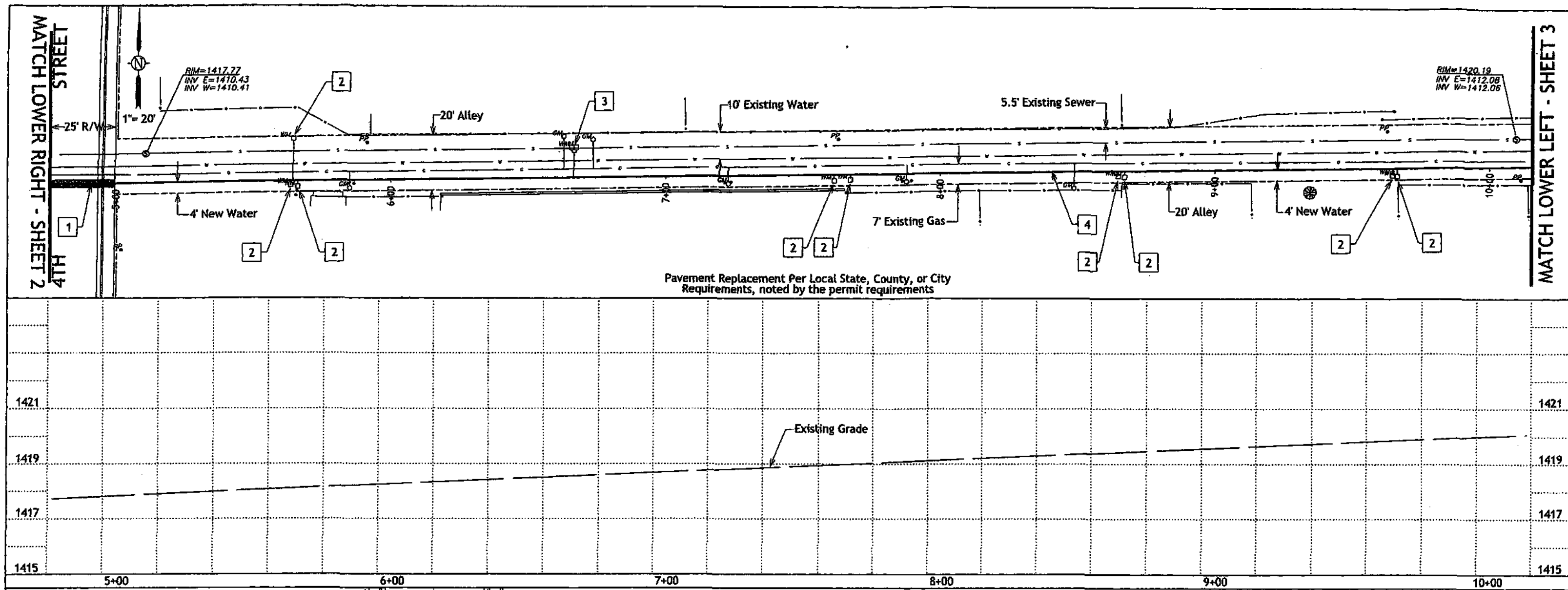
ARIZONA WATER COMPANY

DRAWING No. CL-0354

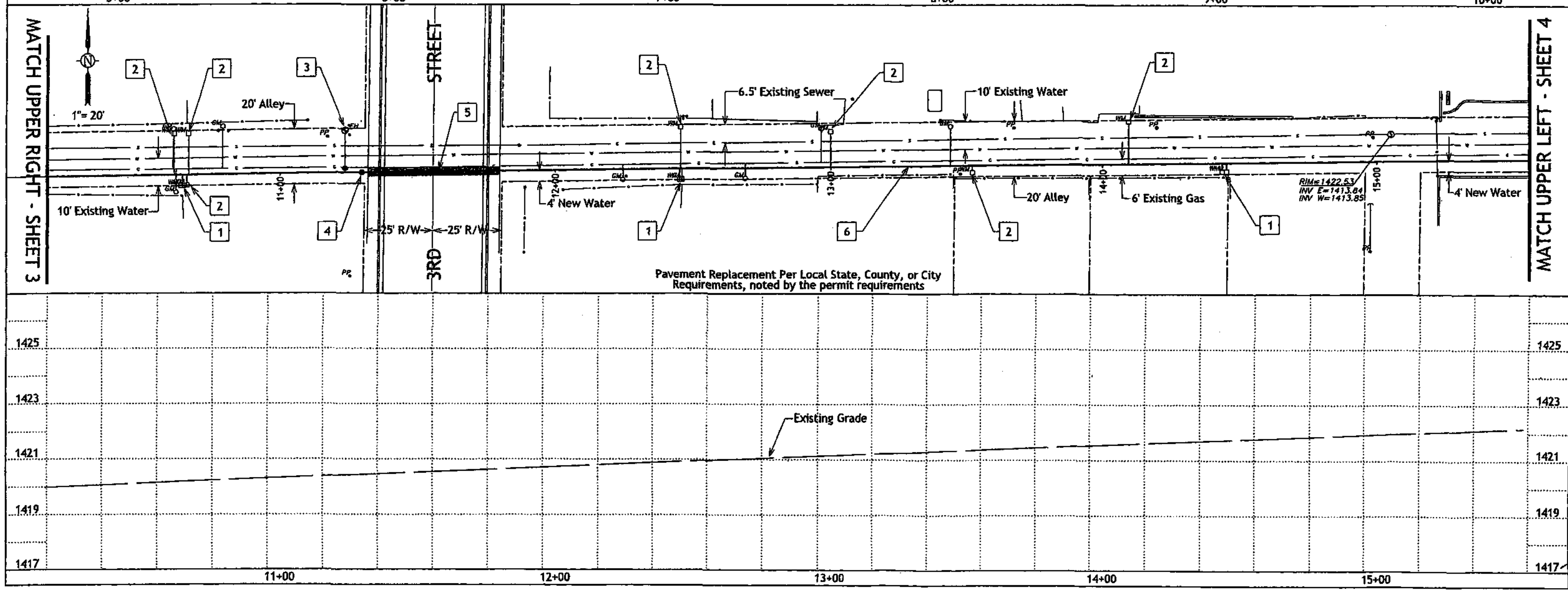
SHEET 2 OF 12



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Sidewalk, Curb, Gutter, and AC Pavement Replacement (8 Sq.Yd)
2. Tie-over Existing Water Service, Typical Single
3. Tie-over Existing Water Service, Typical Double
4. Install 540 LF of 6" C-900 PVC Water Main & Related Fittings



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Tie-over Existing Water Service, Typical Double
2. Tie-over Existing Water Service, Typical Single
3. Tie-Over Existing Fire Hydrant Assemby w/ 6" MJ Tee, 6"RWGV, V.B.&C., Megalugs
4. 6" RWGV, V.B. & C.
5. Sidewalk, Curb, Gutter, and AC Pavement Replacement (16 Sq.yd)
6. Install 540 LF of 6" C-900 PVC Water Main & Related Fittings

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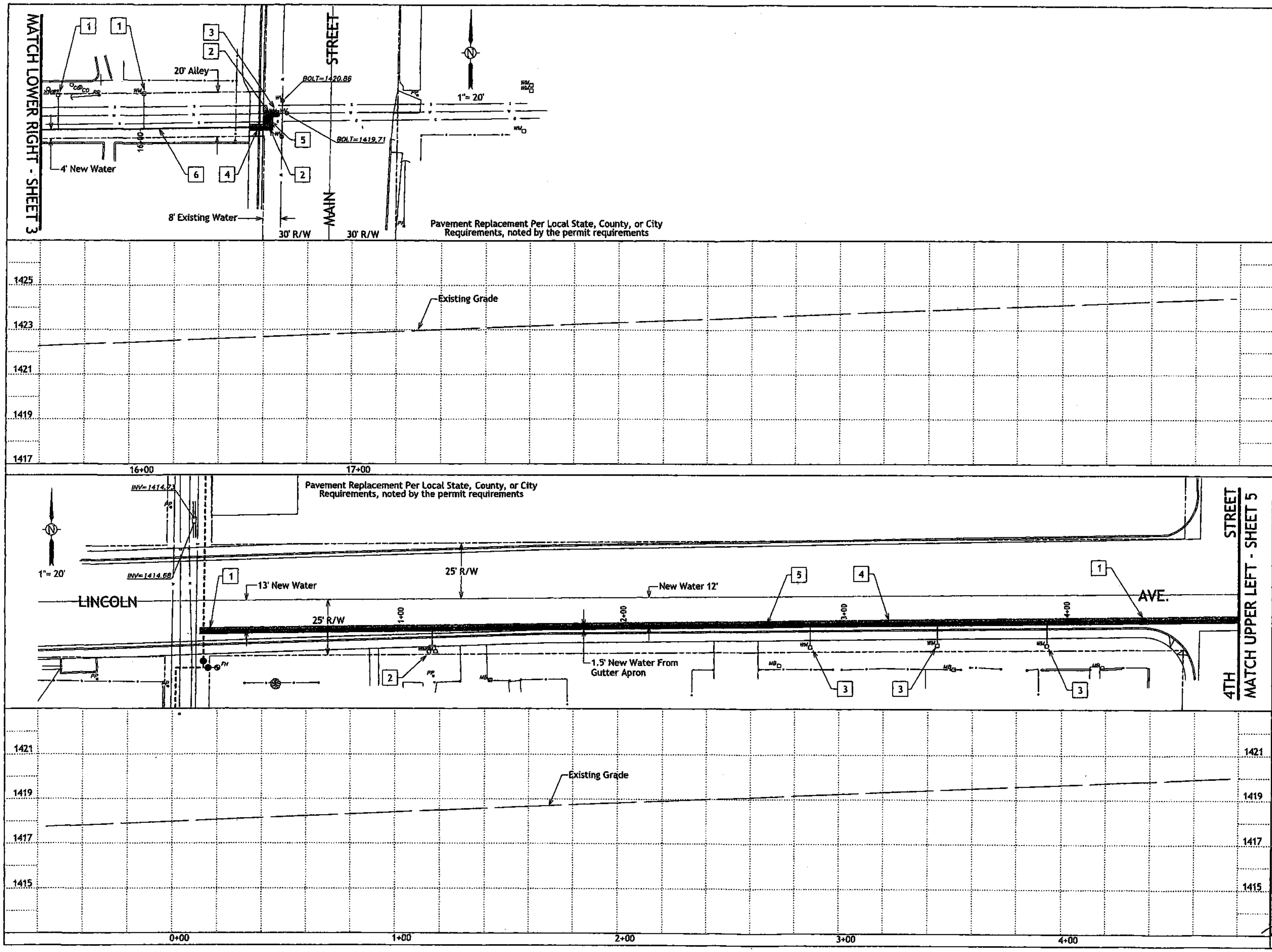
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No.
CL-0354
SHEET 3 OF 12



CONSTRUCTION NOTES

- TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. Tie-over Existing Water Service, Typical Single
2. 6" 90° MJ Ell, w/Megalugs
3. Tie Into Existing 6" RWGV
4. Sidewalk, Curb, Gutter, and AC Pavement Replacement (7 Sq.Yd)
5. Gas Main Crossing - Use Extreme Caution!!
6. Install 110 LF of 6" C-900 PVC Water Main & Related Fittings

CONSTRUCTION NOTES

- TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. 6" RWGV, V.B. & C.
2. Install A New Double Water Service and Tie-Over Existing Customer Lines
3. Install A New Single Water Service and Tie-Over Existing Customer Line
4. Sidewalk, Curb, Gutter, and AC Pavement Replacement (160 Sq.Yd)
5. Install 480 LF of 6" C-900 PVC Water Main & Related Fittings

NO SEWER

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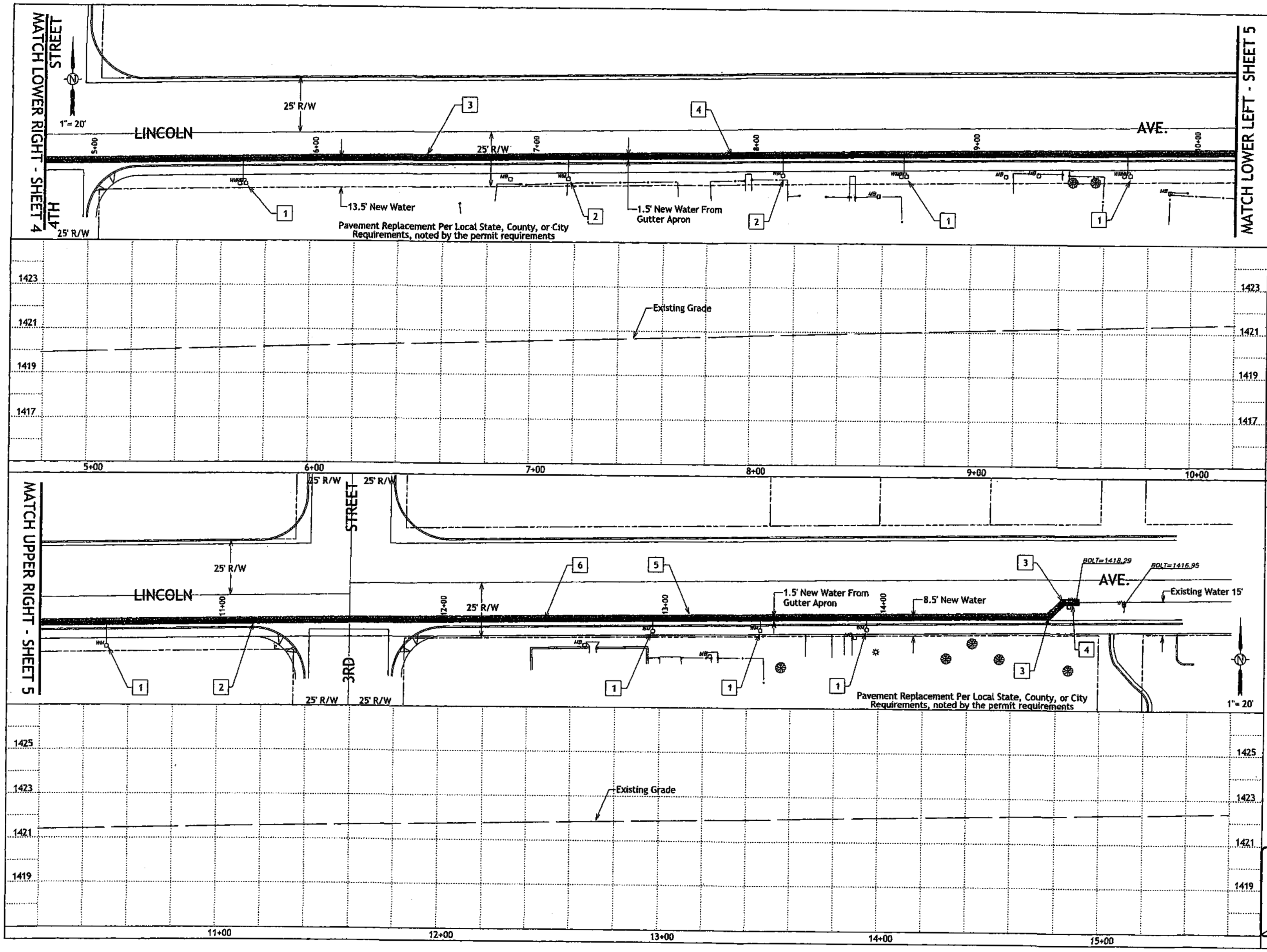
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No.
CL-0354
SHEET 4 OF 12



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Install A New Double Water Service and Tie-Over Existing Customer Lines
2. Install A New Single Water Service and Tie-Over Existing Customer Line
3. Sidewalk, Curb, Gutter, and AC Pavement Replacement (180 Sq.Yd)
4. Install 540 LF of 6" C-900 PVC Water Main & Related Fittings

NO SEWER

CONSTRUCTION NOTES

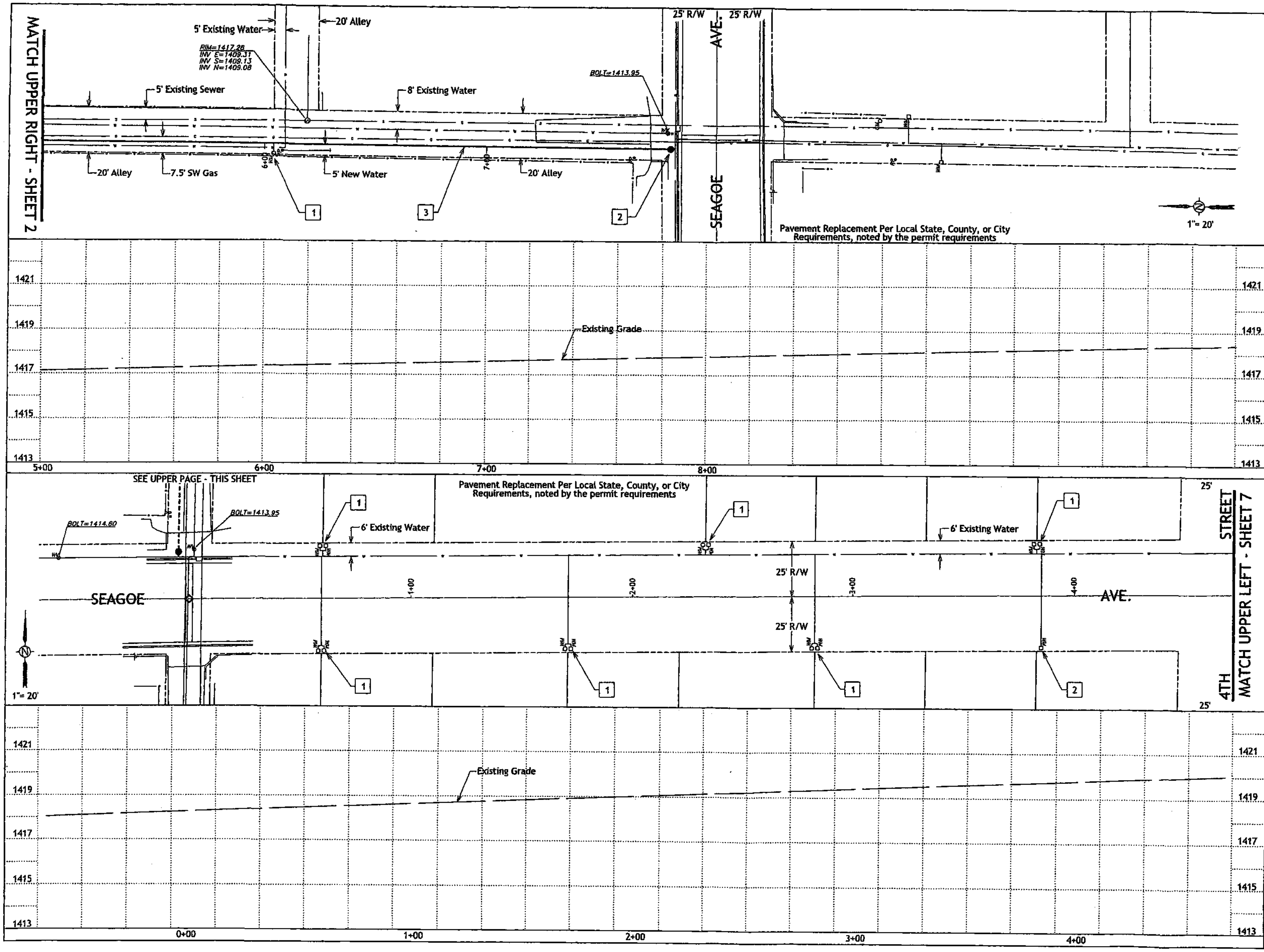
- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Install A New Single Water Service and Tie-Over Existing Customer Line
2. 6" RWGV, V.B. & C.
3. 6" 45° MJ Ell w/Megalugs
4. Tie Into Existing 6" RWGV
5. Sidewalk, Curb, Gutter, and AC Pavement Replacement (180 Sq.Yd)
6. Install 470 LF of 6" C-900 PVC Water Main & Related Fittings

NO SEWER

41048 JAMES T. WILSON
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No. CL-0354
SHEET 5 OF 12



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Tie-over Existing Water Service, Typical Single
2. 10" T.S.,6" T.V.,V.B.& C.
3. Install 285 LF of 6" C-900 PVC Water Main & Related Fittings

CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1. Install A New Double Water Service and Tie-Over Existing Customer Lines
2. Install A New Single Water Service and Tie-Over Existing Customer Line

NO SEWER

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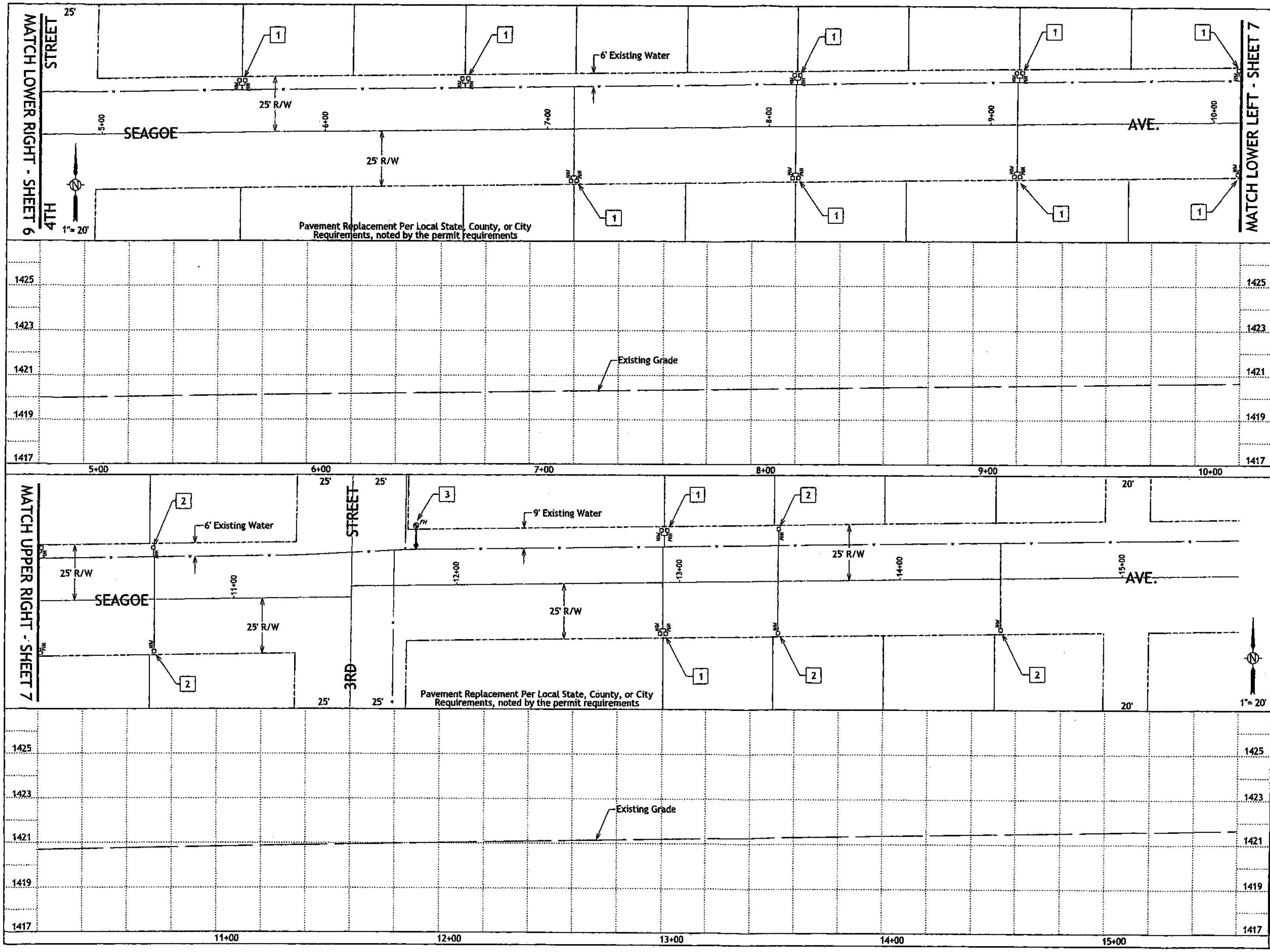
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No.
CL-0354
SHEET 6 OF 12



CONSTRUCTION NOTES

- = TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. Install A New Double Water Service and Tie-Over Existing Customer Lines
2. Install A New Single Water Service and Tie-Over Existing Customer Line

NO SEWER

CONSTRUCTION NOTES

- = TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. Install A New Double Water Service and Tie-Over Existing Customer Lines
2. Install A New Single Water Service and Tie-Over Existing Customer Line
3. Relocate Existing Fire Hydrant to Existing 10-Inch Main (10" T.S.,6"T.V.,V.B.&C.)

NO SEWER

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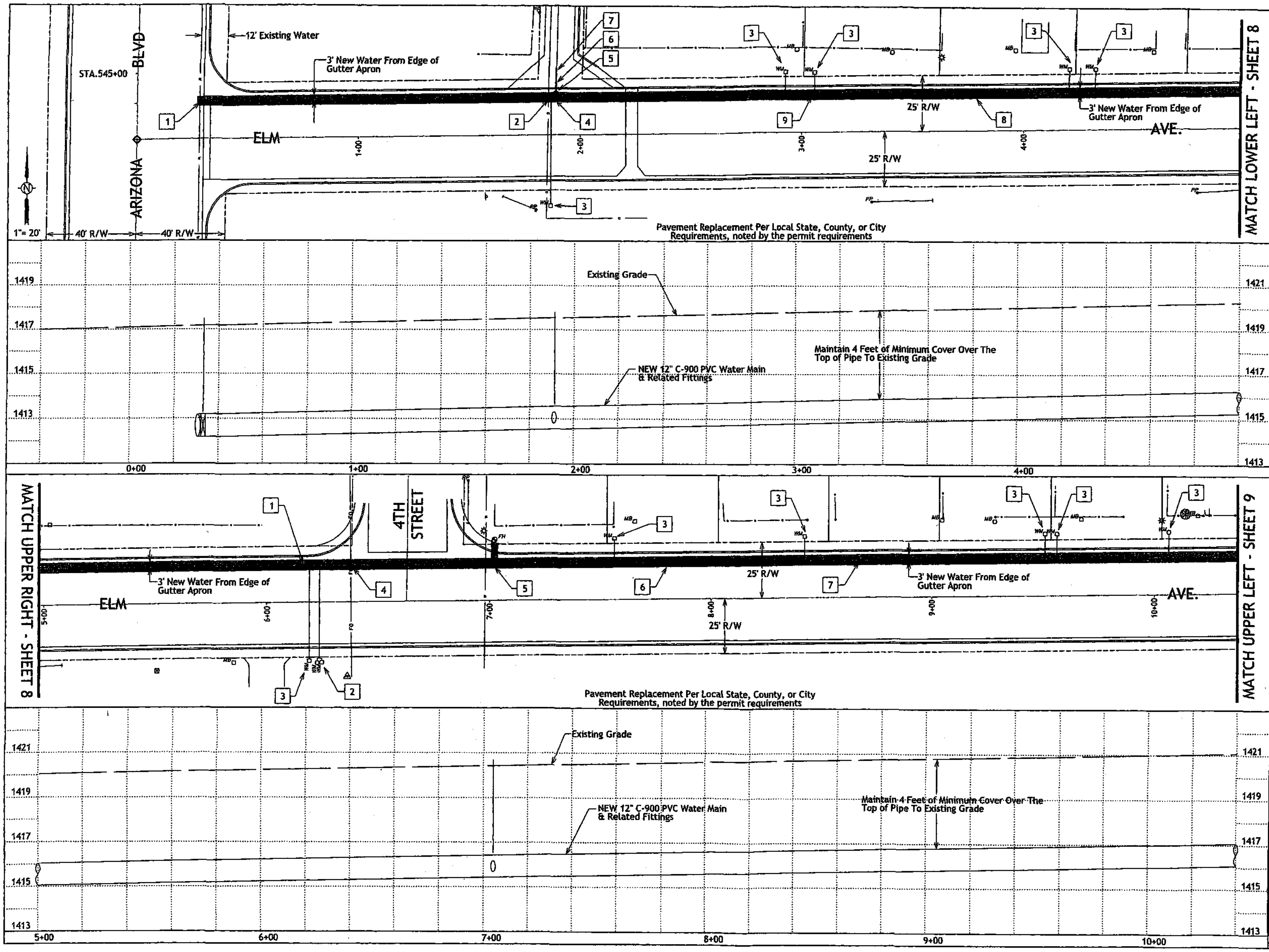
ARIZONA WATER COMPANY
DRAWING No.
CL-0354
SHEET 7 OF 12



CONSTRUCTION NOTES

- ⊛ = TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- ✲ = LIGHT POLE
- WM = WATER METER
- SIGN
- PP = POWER POLE
- CO = CLEANOUT
- P = HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- STORM MANHOLE

1. Tie Into Existing 12" C-900 PVC w/12" T.S., 12" T.V., V.B.&C.
2. SW Gas Main Crossing - Use Extreme Caution!!
3. Install A New Single Water Service and Tie-Over Existing Customer Line
4. 12" x 6" MJ Tee w/Megalugs
5. 6" RWGV, V.B. & C.
6. 6" x 4" MJ Reducer w/Megalugs
7. Tie Into Existing w/4" Transition Coupling
8. Sidewalk, Curb, Gutter, and AC Pavement Replacement (216 Sq.Yd)
9. Install 470 LF of 12" C-900 PVC Water Main & Related Fittings

NO SEWER

CONSTRUCTION NOTES

- ⊛ = TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- ✲ = LIGHT POLE
- WM = WATER METER
- SIGN
- PP = POWER POLE
- CO = CLEANOUT
- P = HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- STORM MANHOLE

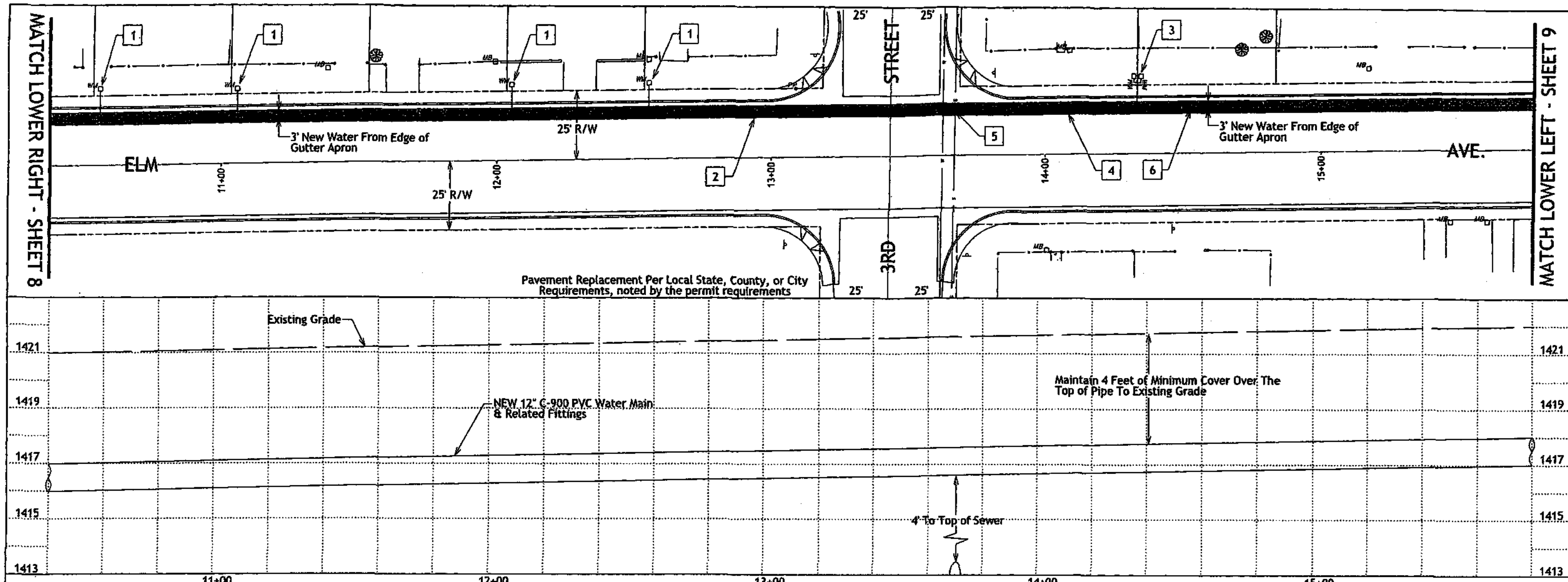
1"= 20'

1. 12" RWGV, V.B. & C.
2. Install A New Double Water Service and Tie-Over Existing Customer Lines
3. Install A New Single Water Service and Tie-Over Existing Customer Line
4. Fiber Optic Crossing - Use Extreme Caution!!
5. Tie Over Existing Fire Hydrant, 12" x 6" MJ Tee, 6" RWGV, Megalug fittings
6. Sidewalk, Curb, Gutter, and AC Pavement Replacement (273 Sq.Yd)
7. Install 528 LF of 12" C-900 PVC Water Main & Related Fittings

NO SEWER

41046 JAMES T. WILSON
Expires 6/30/13 FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No. CL-0354
SHEET 8 OF 12

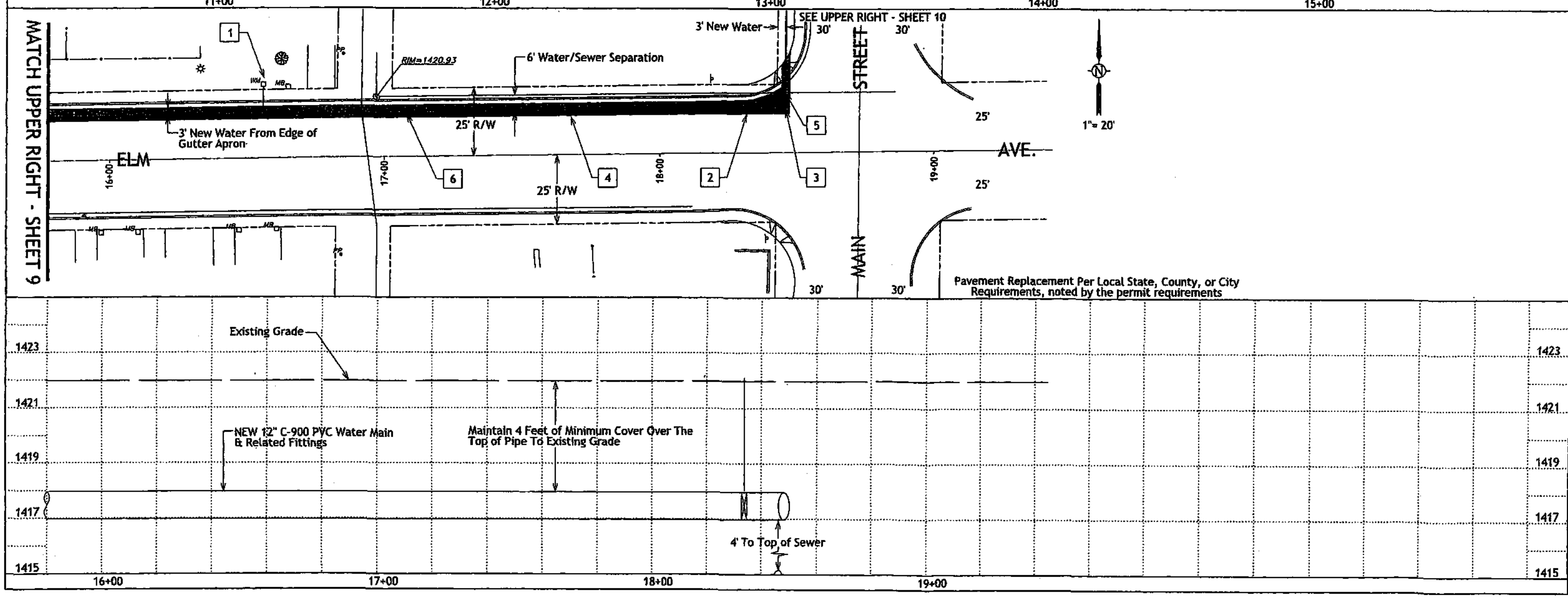


CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

1"= 20'

1. Install A New Single Water Service and Tie-Over Existing Customer Line
2. 12" RWGV, V.B. & C.
3. Install A New Double Water Service and Tie-Over Existing Customer Lines
4. Sidewalk, Curb, Gutter, and AC Pavement Replacement (270 Sq.Yd)
5. Water Crosses Over Sewer. Minimum 2 Foot Separation
6. Install 540 LF of 12" C-900 PVC Water Main & Related Fittings



CONSTRUCTION NOTES

- TREE
- FIRE HYDRANT
- WATER VALVE
- LIGHT POLE
- WATER METER
- SIGN
- POWER POLE
- CLEANOUT
- HOSE BIB
- AIR PRESSURE RELEASE VALVE
- SEWER MANHOLE
- GAS METER
- MAIL BOX
- STORM MANHOLE

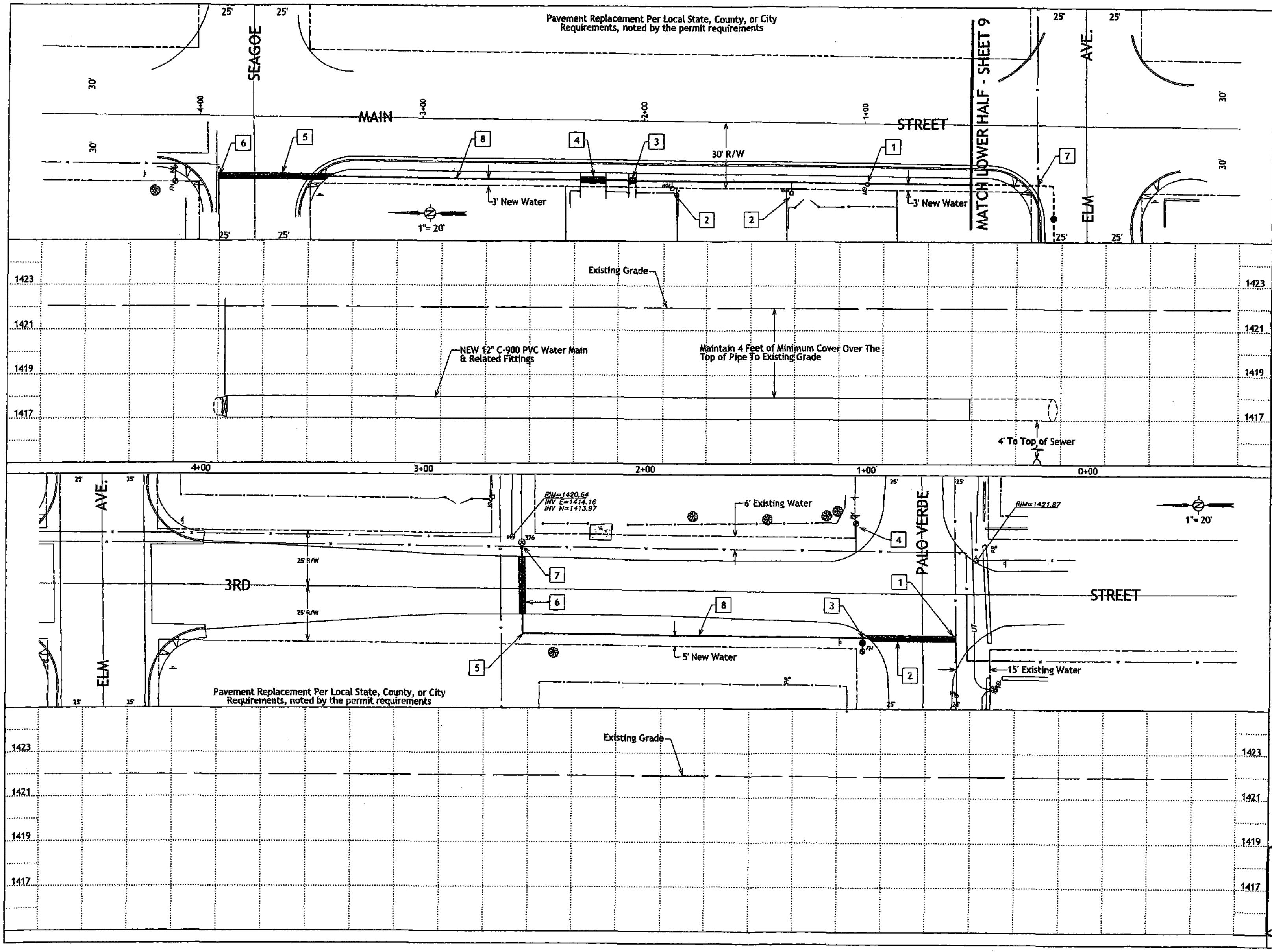
1. Install A New Single Water Service and Tie-Over Existing Customer Line
2. 12" RWGV, V.B. & C.
3. 12" 90° MJ Ell w/Megalugs
4. Sidewalk, Curb, Gutter, and AC Pavement Replacement (143 Sq.Yd)
5. Water Crosses Over Sewer. Minimum 2 Foot Separation
6. Install 304 LF of 12" C-900 PVC Water Main & Related Fittings

41045 JAMES T. WILSON
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY

DRAWING No. CL-0354

SHEET 9 OF 12



CONSTRUCTION NOTES

- = TREE
- FH = FIRE HYDRANT
- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. Relocate Existing Mailbox
2. Install A New Single Water Service and Tie-Over Existing Customer Line
3. 2 Sq.Yd. Sidewalk Replacement
4. 4 Sq.Yd. Sidewalk Replacement
5. Sidewalk, Curb, Gutter, and AC Pavement Replacement (17 Sq.Yd)
6. 10" T.S.,T.V. FLG x MJ, V.B.& C., 10" x 12" MJ Reducer
7. Water Crosses Over Sewer. Minimum 2 Foot Separation
8. Install 340 LF of 12" C-900 PVC Water Main & Related Fittings

CONSTRUCTION NOTES

- = TREE
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- WV = WATER VALVE
- = LIGHT POLE
- WM = WATER METER
- = SIGN
- PP = POWER POLE
- CO = CLEANOUT
- = HOSE BIB
- = AIR PRESSURE RELEASE VALVE
- = SEWER MANHOLE
- GM = GAS METER
- MB = MAIL BOX
- = STORM MANHOLE

1. 6" T.S.,T.V.,V.B.& C. - FLG x MJ
2. Sidewalk, Curb, Gutter, and AC Pavement Replacement (13 Sq.Yd)
3. Relocate Existing Fire Hydrant (90) w/6" MJ Tee, 6" RWGV, V.B.&C., Megalugs
4. Relocate Fire Hydrant Assembly - See Note 3
5. 6" 90° MJ ELL, Megalugs
6. Sidewalk, Curb, Gutter, and AC Pavement Replacement (9 Sq.Yd)
7. Tie Into Existing Valve 376 (FLG x MJ) w/ 6" Restrained FCA (Romac)
8. Install 236 LF of 6" C-900 PVC Water Main & Related Fittings

41049 JAMES T. WILSON
Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY

DRAWING No.
CL-0354

SHEET 10 OF 12

E-8-1
CONSTRUCTION SPECIFICATIONS
FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS
DUCTILE IRON

DEFINITIONS

A. Company. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).

B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.

C. Contractor. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.

D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.

E. Contract. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

a. Special compaction and paving for street crossing.
b. Shoring when required because of the trench depth.
c. Closing a trench in those areas where no open trench is allowed overnight.
d. Barricading and traffic control as required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level at the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bellholes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.

b. Native material 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5-1/4" main valve opening, three way, 6" Mechanical Joint Shoe, 1-1/2" pentagon operating nut, color - yellow, drain open, open direction - left, 4' or 4'-6" bury depending on application. For pumper and hose nozzle information see below.

(1) One - 4" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San Manuel.)

(2) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)

(3) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NPT (Bisbee only.)

(4) One - 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and Two - 2-1/2" Hose Nozzles, NPT (Miami only.)

(5) One - 3-1/2" Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and Two - 2-1/2" Hose Nozzle, NST (Superior only.)

b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adapter, Plug, Blind Flange and Tapped Flange: Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.

(1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16". Part No. 4" - 4FA-BC, 6" - 6FA-BC, 8" - 8FA-BC, 10" - 10FA-BC, 12" - 12FA-BC, 16" - 16FA-BC.

c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, Iron body, including 5/8" x 3/4" Trim Kit. Trim Kit Part No.: 4" - 282080, 6" - 282082, 8" - 282085, 10" - 282495.

d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12" : Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.

e. TRACER WIRE and WARNING TAPE:

(1) TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.

(2) WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.

f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and 1/2" NPT outlet, cast iron body and top flange: with a 5/64" orifice with stainless steel valve sealing faces and BUNA-N rubber.

g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.

h. MEGALUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.

i. METER BOXES:

(1) Concrete Box with a steel regular lid, Number 1: Tucson specification.

(2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.

j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.

k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

(1) Pacific States Cast Iron Pipe Company
(2) Griffin Pipe
(3) United States Pipe and Foundry Company
(4) American Ductile Iron Pipe
(5) Clow Pipe (McWane, Inc.)

l. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.

m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.

n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFitXtra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications - certified to ISO 9001:1994 / Smith - Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: 3/4", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".

Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-8-1).

r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.

s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18 B Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.

t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12": T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners: bypass valves are required on 18" - 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".

u. U-BRANCH: Mueller, H15364, 1" male iron pipe by 3/4" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x 3/4" x 13-1/2", straight line.

v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.

w. VAULTS: Utility Vault Company, Chandler, AZ.

(1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

(2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knock outs and adjustable frame.

(3) 612-SX-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

x. VALVE, METER: Mueller, B24265-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B2411B, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x 3/4" x 7", 5/8 x 3/4" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel; all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required; all material for bracing and shoring trenches and for construction of forms; all barricades and traffic control equipment; all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these Specifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system. Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Specification E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water settling is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 + or - 5 psi at the point of lowest elevation; leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

9. NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

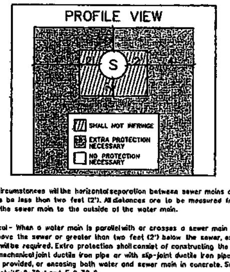
No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.



Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

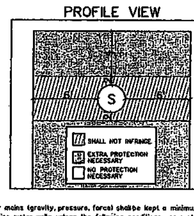
The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.

d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.

e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.



f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:

1. Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.

2. Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.

g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.

h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.

i. Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

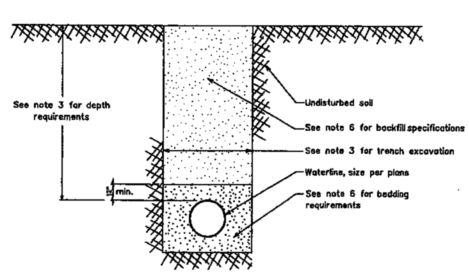
All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System - See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°,7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5°,21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').

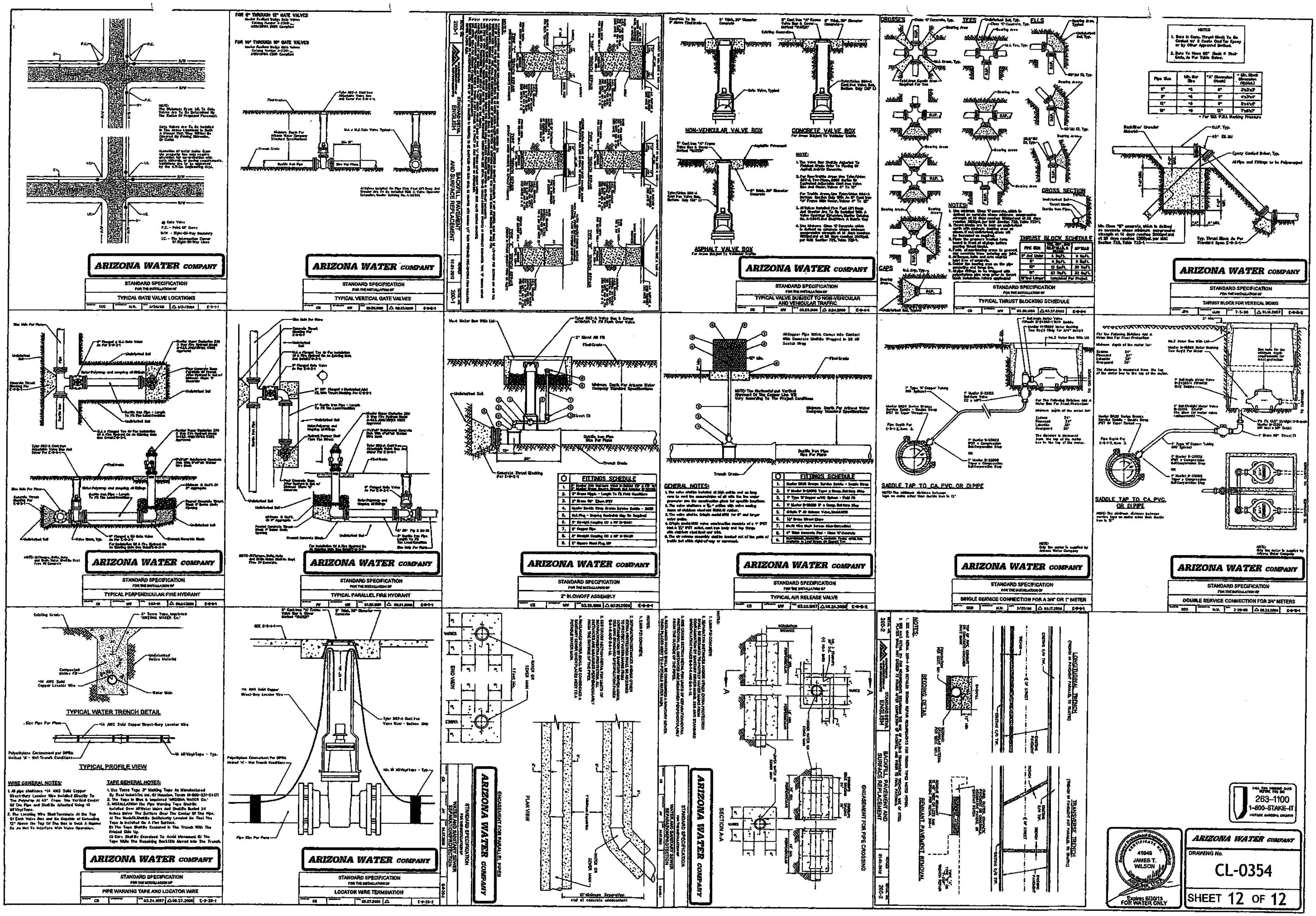


TYPICAL TRENCH DETAIL
Per MAG Detail 601, 601.4.2, 601.4.6

263-1100
1-800-STAKE-IT

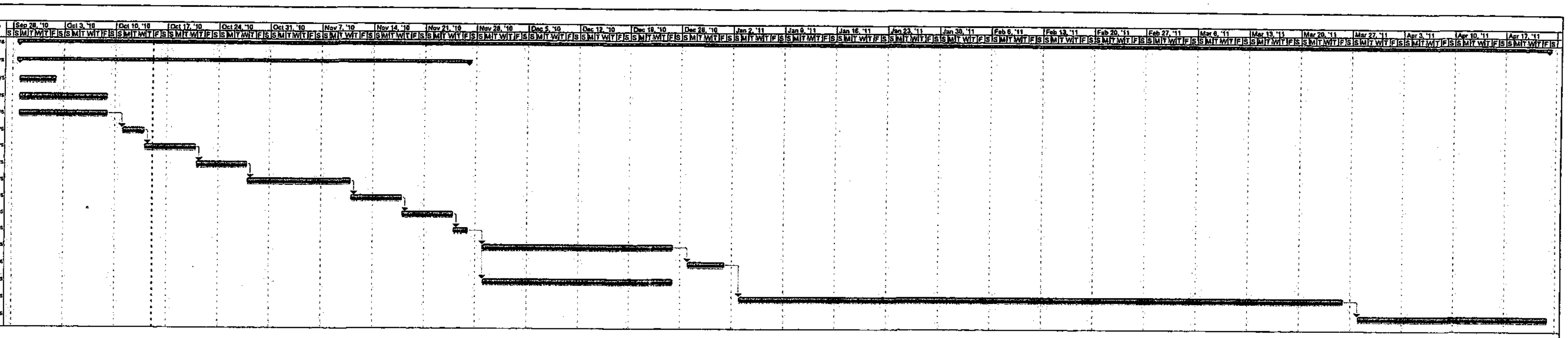
41046
JAMES T. WILSON
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No.
CL-0354
SHEET 11 OF 12


ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL GATE VALVE LOCATIONS
TYPICAL VERTICAL GATE VALVES
BACKFILL, PAVEMENT AND SURFACE REPLACEMENT
NON-VEHICULAR VALVE BOX
CONCRETE VALVE BOX
ASPHALT VALVE BOX
TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
CROSSES
TEES
ELLS
CAPS
CROSS SECTION
THRUST BLOCK SCHEDULE
TYPICAL THRUST BLOCKING SCHEDULE
THRUST BLOCK FOR VERTICAL BENDS
TYPICAL PERPENDICULAR FIRE HYDRANT
TYPICAL PARALLEL FIRE HYDRANT
FITTINGS SCHEDULE
2" BLOWOFF ASSEMBLY
GENERAL NOTES:
TYPICAL AIR RELEASE VALVE
SADDLE TAP TO CA, PVC, OR DIPIPE
SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER
DOUBLE SERVICE CONNECTION FOR 3/4" METERS
TYPICAL WATER TRENCH DETAIL
TYPICAL PROFILE VIEW
WIRE GENERAL NOTES:
TAPE GENERAL NOTES:
PIPE WARNING TAPE AND LOCATOR WIRE
LOCATOR WIRE TERMINATION
ENCASEMENT FOR PARALLEL PIPES
PLAN VIEW
END VIEW
WATER AND SANITARY SEWER SEPARATION/PROTECTION
ENCASEMENT FOR PIPE CROSSING
SECTION A-A
LONGITUDINAL TRENCH
TRANSVERSE TRENCH
BEDDING DETAIL
REMNANT PAVEMENT REMOVAL
263-1100
1-800-STAKE-IT
JAMES T. WILSON
41048
FOR WATER ONLY
DRAWING No.
CL-0354
SHEET 12 OF 12

COOLIDGE OLD TOWN

ID	Task Name	Duration
1	Finish Waterline Project	150 days
2	Waterline Design Drawings	45 days
3	Coordinate New Waterline Location W/Field	5 days
4	Acquire Existing Utility As-Builts	10 days
5	Bid R/W Survey	10 days
6	Consulting Agreement for Survey & MOB	3 days
7	Perform R/W Survey	5 days
8	Develop Base Drawings & Set-up Sheets/Details	5 days
9	Preliminary Design Drawings	10 days
10	Preliminary Drawings to Field for Comment	5 days
11	Final Design Drawings	5 days
12	QA/QC	2 days
13	ADEQ ATC	20 days
14	City of Coolidge R/W Permit	5 days
15	Bid Waterline Construction & Award Contract	20 days
16	Construction	60 days
17	ADEQ AOC	20 days

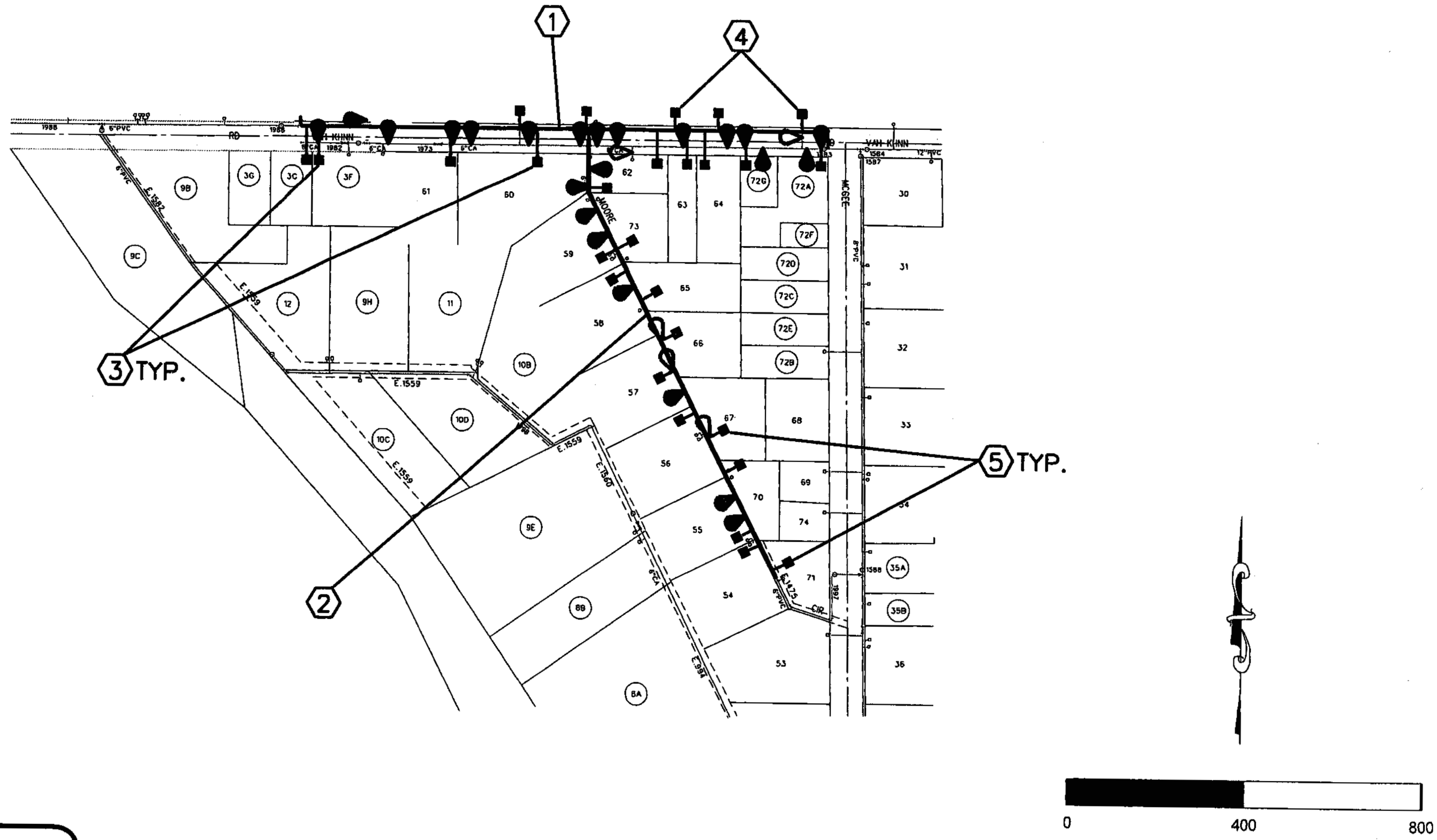


Project: Waterline Replacement Desig
Date: Fri 10/15/10

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

WA1-4773

VALLEY FARMS



QUANTITIES LIST

ITEM		QTY.
1	INSTALL 12" PVC	1,200 LF
2	INSTALL 6" PVC	1,100 LF
3	INSTALL LONG SERVICE	9 EA.
4	INSTALL SHORT SERVICE	5 EA.
5	INSTALL SERVICE	13 EA.

PRELIMINARY DRAWING
VALVE AND FIRE HYDRANT LOCATION
TO BE DETERMINED IN PROJECT DESIGN

WATER SERVICES TO BE DOUBLE SERVICES
WHERE POSSIBLE

WATER MAIN REPAIR/REPLACEMENT

SERVICE LINE REPAIR/REPLACEMENT

ARIZONA WATER COMPANY

PROJECT DESCRIPTION

INSTALL 1,200 LF OF 12" PVC, 1,100 LF OF 6" PVC
AND 27 SERVICE CONNECTIONS ALONG VAH KI INN ROAD AND MOORE CIRCLE.

PROJECT LOCATION

NW 1/4 SEC. 20-T.5S., R.9E.

DRAWN BY:	APPROVED BY:	DATE:	REFERENCE MAP:
JS	AH/FS	12/29/2010	N/A

Valley Farms

LEAK LOCATION	SECTION	DATE	TYPE
11133 E. Vah Ki Inn Road	NW 1/4 Sec 20 T5S R9E	10/2/2009	Main Repair
11877 Moore Road	NW 1/4 Sec 20 T5S R9E	9/26/2009	Service Repair
11983 Moore Road	NW 1/4 Sec 20 T5S R9E	8/14/2009	Main Repair
11983 Moore Road	NW 1/4 Sec 20 T5S R9E	6/30/2009	Main Repair
McGee Road Lot 72A	NW 1/4 Sec 20 T5S R9E	7/29/2009	Main Repair
Moore Road & Vah Ki Inn Road	NW 1/4 Sec 20 T5S R9E	8/31/2009	Main Repair
Moore Road Northwest corner of Lot 67	NW 1/4 Sec 20 T5S R9E	1982	Main Repair
Moore Road Northwest side of Lot 65	NW 1/4 Sec 20 T5S R9E	1990	Main Repair
Moore Road Northwest side of Lot 70	NW 1/4 Sec 20 T5S R9E	2000	Main Repair
Moore Road Southwest corner of Lot 57	NW 1/4 Sec 20 T5S R9E	1985	Service Replacement
Moore Road Southwest side of Lot 67	NW 1/4 Sec 20 T5S R9E	1983	Service Replacement
Moore Road Southwest side of Lot 70	NW 1/4 Sec 20 T5S R9E	1989	Main Repair
Moore Road West middle of Lot 73	NW 1/4 Sec 20 T5S R9E	1987	Main Repair
SW Corner of Vah Ki Inn Road & McGee	NW 1/4 Sec 20 T5S R9E	5/15/2009	Service Repair
Vah Ki Inn Road Lot 3F	NW 1/4 Sec 20 T5S R9E	2003	Main Repair
Vah Ki Inn Road Lot 72G	NW 1/4 Sec 20 T5S R9E	2009	Main Repair
Vah Ki Inn Road Middle of Lot 60	NW 1/4 Sec 20 T5S R9E	1982	Main Repair
Vah Ki Inn Road North middle of Lot 62	NW 1/4 Sec 20 T5S R9E	1983	Main Repair
Vah Ki Inn Road North middle of Lot 62	NW 1/4 Sec 20 T5S R9E	1988	Service Replacement
Vah Ki Inn Road North middle of Lot 63	NW 1/4 Sec 20 T5S R9E	1977	Main Repair
Vah Ki Inn Road North middle of Lot 64	NW 1/4 Sec 20 T5S R9E	1979	Main Repair
Vah Ki Inn Road Northeast corner of Lot 60	NW 1/4 Sec 20 T5S R9E	1984	Main Repair
Vah Ki Inn Road Northeast corner of Lot 61	NW 1/4 Sec 20 T5S R9E	2003	Main Repair
Vah Ki Inn Road Northeast corner of Lot 64 and Lot 72	NW 1/4 Sec 20 T5S R9E	1978	Main Repair
Vah Ki Inn Road Northwest corner of Lot 3F	NW 1/4 Sec 20 T5S R9E	2001	Service Repair
Vah Ki Inn Road Northwest corner of Lot 60	NW 1/4 Sec 20 T5S R9E	1987	Main Repair
Vah Ki Inn Road Northwest corner of Lot 61	NW 1/4 Sec 20 T5S R9E	1986	Main Repair
Vah Ki Inn Road Northwest corner of Lot 62	NW 1/4 Sec 20 T5S R9E	1981	Main Repair

ARIZONA WATER COMPANY
WORK AUTHORIZATION

W.A. NUMBER: 1-4773
P.E. NUMBER:
BUDGET ITEM NO.: Special #24
SHEET NO.: 1 of 2

SYSTEM:	PINAL VALLEY		
DIVISION:	PINAL VALLEY	WORK TO START BY:	UPON AUTHORIZATION
TAX CODE:	2103	WORK TO BE FINISHED BY:	WITHIN 125 DAYS

DESCRIPTION OF WORK:

Valley Farms Main Replacement project: Replace approximately 2,000 lf of 6-inch CA pipe with 1,300 lf of 12-inch and 700 lf of 6-inch C-900 PVC. Construct in accordance with attached drawings and/or Arizona Water Company specifications.

FACTORS JUSTIFYING WORK:

The Company has experienced several leaks on these waterlines due to age of the pipe and failing gaskets contributing to increasing water loss in the Coolidge system. A portion of these waterlines were replaced in 2004-2008.

COST ESTIMATE		AUTHORIZATION	DATE
COST OF WORK:		PREPARED BY:	
MATERIAL	0	James Wilson JW 10/27/10	10/22/10
LABOR	6,200	REVIEWED FOR ESMT/ROW VERIFICATION:	
CONTRACT PORTION	128,100	Charles Briggs CB 10-28-2010	10-22-2010
OVERHEAD	32,232	REVIEWED BY:	
TOTAL AUTHORIZED EXPENDITURES CHARGEABLE TO THIS W.A.	$ 166,532	Mike Loggins ML 10-28-10	10-22-10
FUNDS RECEIVED:		APPROVED BY ENGINEERING:	
CONTRIBUTIONS RECEIVED	0	Fredrick Schneider FS 10-28-10	10-22-10
REFUNDABLE ADVANCES RECEIVED	0	APPROVED BY FINANCE:	
TOTAL CONTRIBUTIONS/ADVANCES	0	Joseph Harris	10/22/10
NET CASH REQUIRED	$ 166,532	SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY PRESIDENT: William Garfield	10-23-2010
COMMENTS:		SPECIAL ITEM EXCEEDING $10,000; AUTHORIZED BY CHAIRMAN: APPROVED VIA FAX M. L. Whitehead	10/27/2010
		CONSTRUCTION RELEASE: **RELEASED TO CONSTRUCTION** Authorized by: FRED SCHNEIDER Date 10/27/10	

AFH

ARIZONA WATE COMPANY

WORK AUTHORIZATION - DETAIL SHEET

W.A. NUMBER: 1-4773
P.E. NUMBER:
BUDGET ITEM NO.: Special #24

RETIREMENT PROPERTY UNITS	PLANT PROPERTY ACCOUNT	UNIT DESCRIPTION	QUANTITY	YEAR INSTALLED AND W.A. NUMBER
	343	6-inch CA pipe	2000	1935

PROJECT DESCRIPTION:

Valley Farms Main Replacement project: Replace approximately 2,000 lf of 6-inch CA pipe with 1,300 lf of 12-inch and 700 lf of 6-inch C-900 PVC.

	DESCRIPTION	PLANT PROP ACCT	QUANTITY	UNIT COST	TOTAL
CONTRACT WORK	12" C-900 PVC w/ all related fittings	343	1,300	$ 55.00	$ 71,500
	6" C-900 PVC w/ all related fittings and pavement replacement	343	700	45.00	31,500
	Tie into existing 12" and 8" C-900 with 12"x8" tee and valves	343	1	4,500.00	4,500
	Tie into existing 6" PVC	343	1	1,500.00	1,500
	Tie into existing 6" PVC with 12"x6" reducer	345	1	1,500.00	1,500
	Tie over existing services to new main	348	22	800.00	17,600
	SERVICE CONNECTIONS COMPLETE: DOUBLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-LONG	345			
	SERVICE CONNECTIONS COMPLETE: SINGLE-SHORT	345			
TOTAL CONTRACT WORK					$ 128,100
MATERIALS					
	SERVICE CONNECTIONS: DOUBLE-LONG	345			
	SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	SERVICE CONNECTIONS: SINGLE-LONG	345			
	SERVICE CONNECTIONS: SINGLE-SHORT	345			
	METERS	346			
TOTAL MATERIALS					$ -
LABOR					
	TESTING FEE	343	1	$ 500.00	500
	PERMIT FEE	343	1	1,500.00	1,500
	SURVEY FEE	343	1	2,500.00	2,500
	FIELD INSPECTION	343	1	1,700.00	1,700
	INSTALL SERVICE CONNECTIONS: DOUBLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: DOUBLE-SHORT	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-LONG	345			
	INSTALL SERVICE CONNECTIONS: SINGLE-SHORT	345			
TOTAL LABOR					$ 6,200
SUBTOTAL - CONTRACT WORK, MATERIALS, AND LABOR					$ 134,300
OVERHEAD					32,232
TOTAL	REFUNDABLE PORTION ☐	NON-REFUNDABLE PORTION ☐		COST ESTIMATE	$ 166,532

AFH

AGREEMENT FOR CONSULTING SERVICES BETWEEN
ARIZONA WATER COMPANY AND
HANSEN ENGINEERING & SURVEYING

THIS AGREEMENT is made and entered into on this 15th day of October 2010, by and between Arizona Water Company, an Arizona corporation, hereinafter referred to as "Client", and Hansen Engineering & Surveying, an Arizona corporation hereinafter referred to as "Consultant".

RECITALS

WHEREAS, Client is authorized to and desires to retain Consultant to provide engineering design, post design and construction administration services to locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) within the Right-of-Way as described in Exhibit A attached hereto.

WHEREAS, Consultant is agreeable to providing personnel and facilities necessary to perform the desired services within Client's required time; and

WHEREAS, Client desires to retain Consultant to perform the services in the manner, at the time, and for the compensation set forth herein;

NOW, THEREFORE, Client and Consultant agree as follows:

1. Description of Project.

Client and Consultant agree that Project is as described in Exhibit A, hereto, incorporated by reference herein and entitled "Scope of Work", dated October 14, 2010. If, during the course of Project, Client and Consultant agree to changes in Project, such changes shall be effective only after being incorporated in this Agreement by written amendment, signed by representative of Client and Consultant.

2. Scope of Consultant Services.

Consultant agrees to perform those services described hereafter. Unless modified in writing by both parties, duties of Consultant shall not be construed to exceed those services specifically set forth herein.

a. Basic Services. Consultant agrees to perform those services described in the Scope of Work (the "Services"). Any tasks not specifically described in the Scope of Work will be Additional Services.

b. Additional Services. Client shall pay Consultant all fees and costs incurred in performing Additional Services provided the services were authorized by Client in writing. Unless otherwise agreed in writing, Additional Services shall be compensated in accordance with Consultant's standard billing rates at the time the Additional Services are performed.

c. Litigation Assistance. Unless specifically stated therein, the Scope of Work does not include assistance to support, prepare, document, bring, defend or assist in litigation undertaken or defended by Client. All such services required or requested of the Consultant by Client or any third party (except claims between Client and Consultant) will be reimbursed at Consultant's applicable rates for such litigation services.

3. Responsibilities of Client.

In addition to payment for the Services performed under this Agreement, Client shall:

a. Assist and cooperate with Consultant in any manner necessary and within its ability to facilitate Consultant's performance under this Agreement.

b. Designate in writing a person to act as Client's representative with respect to this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Client's policies, make decisions and execute documents on Client's behalf.

c. Furnish Consultant with all technical data in Client's possession including, but not limited to, maps, surveys, drawings, soils or geotechnical reports and any other information required by or useful to Consultant in performance of the Services under this Agreement.

d. Notify Consultant of any known or potential health or safety hazards existing at or near the project site.

e. Provide access to and/or obtain permission for Consultant to enter upon project related property during normal business hours, whether or not owned by Client, as required to perform and complete the Services.

4. Americans with Disabilities Act.

Any other provision of this Agreement to the contrary notwithstanding, unless otherwise specified in the Scope of Services, Client's contractors shall have sole responsibility as between Client and Consultant for compliance with the Americans With Disabilities Act ("ADA") 42 U.S.C. 12101 et. Seq. and the related regulations. Consultant shall provide client with applicable ADA criteria, which may be required.

5. Authorization and Completion.

In signing this Agreement Client grants Consultant specific authorization to proceed with work as described in Scope of Work and under the terms of this Agreement.

6. Compensation.

a. Amount. For the Services described in Exhibit A, Client agrees to pay, and Consultant agrees to accept compensation in accordance with Exhibit B, attached hereto and incorporated herein. Where Consultant has provided Client with a breakdown of the total compensation into subtasks, such breakdowns are estimates only. Consultant may reallocate compensation between tasks, provided total compensation is not exceeded without the prior written approval of Client.

b. Payment. As long as Consultant has not defaulted under this Agreement, Client shall pay Consultant within thirty (30) days of the date of Consultant's invoices for services performed and reimbursable expenses incurred under this Agreement. If Client has reason to question or contest any portion of any such invoice, amounts questioned or contested shall be identified and notice given to Consultant within thirty (30) days of the date of the invoice. Any portion of any invoice not contested shall be deemed to be accepted and approved for payment and shall be paid to Consultant within thirty (30) days of the date of the invoice. Client agrees to cooperate with Consultant in a mutual effort to resolve promptly any contested portions of Consultant's invoices.

In the event any uncontested portions of any invoice are not paid within thirty (30) days of the date of Consultant's invoice, interest on the unpaid balance shall accrue beginning with the 31st day at the rate of 1.5% per month, and Consultant shall have the right to suspend work per Article XV, Suspension of Work.

7. Responsibility of Consultant.

a. Standard of Care Professional Services.

Subject to the limitations inherent in the agreed scope of work as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Agreement, Consultant shall perform the Services and any Additional Services in accordance with generally accepted standards and practices customarily utilized by competent engineering firms in effect at the time Services and any Additional Services are rendered. Consultant does not expressly or impliedly warrant or guarantee its Services.

b. Reliance upon Information Provided by Others.

If Consultant's performance of services hereunder requires Consultant to rely on information provided by other parties (excepting Consultant's subcontractors), Consultant shall not independently verify the validity, completeness, or accuracy of such information unless otherwise expressly engaged to do so in writing by Client.

c. Consultant's Opinion of Costs.

Client acknowledges that construction cost estimates, financial analyses and feasibility projections are subject to many influences including, but not limited to, price of labor and materials, unknown or latent conditions of existing equipment or structures, and time or quality of performance by third parties. Client acknowledges that such influences may not be precisely forecasted and are beyond the control of Consultant and that actual costs incurred may vary substantially from the estimates prepared by Consultant. Consultant does not warrant or guarantee the accuracy of construction or development cost estimates, however, Consultant agrees to exercise its best Professional Judgment in rendering its opinions.

d. Construction Phase Services.

1. Consultant's Activities at Construction Site. The presence of Consultant's personnel at a construction site, whether as on-site representative, resident engineer, construction manager, or otherwise, does not make Consultant responsible for those duties that belong to Client and/or construction contractors or others, and does not relieve construction contractors or others of their obligations, duties, and responsibilities, including, but not limited to, construction methods, means, techniques, sequences, and procedures necessary for completing all portions of the construction work in accordance with the contract documents, any health or safety programs and precautions required by such construction work, and any compliance with applicable laws and regulations. Any inspection or observation of the contractor's work is for the purpose of determining that the work is proceeding in conformance with the intent of the project specifications and contract documents. Consultant has no authority to exercise control over any construction contractor in connection with their work or health or safety programs and precautions. Except to protect Consultant's own personnel and except as may be expressly required elsewhere in the Scope of Work, Consultant has no duty to inspect, observe, correct, or report on health or safety deficiencies of the construction contractor.

2. Shop Drawing and Submittal Review. If required by Consultant's Scope of Services, Consultant shall review shop drawings or other contractor submittals for general conformance with the intent of the contract documents. Except for services completed under direct contract to Consultant, Consultant shall not be required to verify dimensions, to engineer contractor's shop drawings or submittals, nor to coordinate shop drawings or other submittals with other shop drawings or submittals provided by contractor.

3. Record Drawings. Record drawings, if required, will be prepared, in part, on the basis of information compiled and furnished by others, and may not always represent the exact location, type of various components, or exact manner in which the Project was finally constructed. Except for services completed under direct contract to Consultant, Consultant is not responsible for any errors or omissions in the information from others that are incorporated into the record drawings.

e. Scope of Work.

1. Before preparing the scope of work, Consultant specifically acknowledges and agrees that it has inspected and familiarized itself with Client's project site. The Consultant has received, or had the opportunity to inquire about and/or request all relevant information concerning the Scope of Work from Client or any other source

Consultant deems necessary. The Scope of Work has been prepared by the Consultant and to the best of its knowledge includes all applicable work required to successfully complete project.

8. Asbestos/Hazardous Material.

Consultant and Consultant's subcontractors shall have no responsibility for the discovery, handling, removal, or disposal of, or exposure of persons to asbestos or hazardous or toxic materials that are present in any form at the project site. Professional services related to or in any way connected with the investigation, detection, abatement, replacement, use, specification, or removal of products, materials, or processes containing asbestos or hazardous or toxic materials are beyond the scope of this Agreement.

In the event Consultant encounters asbestos or hazardous materials at the jobsite, Consultant may, at its option and without liability for damages, suspend the performance of services on the Project until such time as Client and Consultant mutually agree on an amendment to this Agreement to address the issue, or Client retains another specialist consultant or contractor to identify, classify, abate and/or remove the asbestos and/or hazardous materials.

9. Consultant's Work Product.

a. Scope.

Consultant's work product which is prepared solely for the purposes of this Agreement, including, but not limited to, drawings, test results, recommendations and technical specifications, whether in hard copy or electronic form, shall become the property of Client when Consultant has been fully compensated as set forth herein. Consultant may keep copies of all work product(s) for its records.

Consultant and Client recognize that Consultant's work product submitted in performance of this Agreement is intended only for the project described in this Agreement. Client's alteration of Consultant's work product or its use by Client for any other purpose shall be at Client's sole risk.

b. Electronic Copies.

If requested, solely as an aid and accommodation to Client, Consultant may provide copies of its work product documents in computer-readable media ("electronic copies", "CADD"). These documents will duplicate the documents provided as work product, but will not bear the signature and professional seals of the registered professionals responsible for the work. Client is cautioned that the accuracy of electronic copies and CADD documents may be compromised by electronic media degradation, errors in format translation, file corruption, printing errors and incompatibilities, operator inexperience and file modification. Consultant will maintain the original copy, which shall serve as the official, archived record of the electronic and CADD documents.

10. <u>Indemnification.</u>

a. The Consultant shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, loss, actions, causes of action, expense, penalties, fines, assessments, damages and costs of every kind and nature for injury to or death of any and all persons, including, without limitation, employees or representatives of the Company or of the Consultant or of any subcontractor, or any other person or persons, and for damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, property of the Company or of the Consultant or of any subcontractor, or of any other person or persons, and the violation of any law, ordinance, rule, regulation, standard, or order resulting from, or in any manner arising out of, or in connection with, the performance of the work under the Contract, howsoever same may be caused, including, without limitation, the Company's active or passive negligence. The Consultant shall also, upon request by the Company, and at no expense to the Company, defend the Company in any and all suits, concerning such injury to or death of any and all persons, and concerning such damage, destruction or loss, consequential or otherwise, to or of any and all property, real or personal, including, without limitation, suits by employees or representatives of the Company or of the Consultant or of any subcontractor, or any other person or persons, or concerning any court or administrative proceeding concerning the violation of any law, ordinance, rule, regulation, standard, or order. Excluded from this paragraph are only those injuries to or deaths of persons and damage, destruction or loss, to or of property arising from the sole negligence or willful misconduct of the Company.

b. Consultant shall indemnify the Company against, and save and hold it harmless from, any and all liability, claims, demands, damages, costs, expenses and attorney's fees, suffered or incurred on account of any breach of any obligation, covenant or other provision of this contract, including without limitation, breach of the indemnity provisions of subsection A of this Section 36.

c. Consultant further agrees to defend, indemnify and hold harmless the Company, its directors, officers, employees, and agents, from and against any and all costs, damages, claims, expenses, violations, notices of violations, penalties, liens, assessments, and liabilities of every kind and nature, foreseeable or unforeseeable, directly or indirectly, arising from any release, removal, generation, use, storage or disposal on, under, around, or from the project site of any material, substance, or waste, hazardous or nonhazardous, including, without limitation, drilling fluids, mud, cuttings and development and test water howsoever same may be caused, including, without limitation, the Company's active or passive negligence.

11. <u>Consultant's Insurance.</u>

Consultant shall procure and maintain the following minimum insurance:

a. Commercial general liability insurance, including personal injury liability, blanket contractual liability and broad-form property damage liability coverage. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.

b. Automobile bodily injury and property damage liability insurance covering owned, non-owned, rented, and hired cars. The combined single limit for bodily injury and property damage shall be not less than $1,000,000.

c. Statutory workers' compensation and employer's liability insurance as required by state law.

d. Professional liability insurance. The policy limit shall be not less than $1,000,000.

Consultant shall either require each of its subconsultants to procure and to maintain the insurance specified in this section or insure its subconsultants in the Consultants own policy, in like amounts.

Client shall be named as additional insured on polices 1 and 2 above. Upon execution of this Agreement, Consultant will provide a certificate of insurance to Client. Consultant will keep the certificate current at all times while this Agreement is in effect. The Consultant will provide a 30-day written notice in the event the above policies are cancelled.

12. Confidentiality.

Consultant agrees it will maintain the confidentiality of all material it receives from Client and will not disclose, distribute, or publish to any third party such information without the prior permission of Client. Notwithstanding the foregoing, Consultant shall have no confidentiality obligation with respect to information that:

a. becomes generally available to the public other than as a result of disclosure by Consultant or its agents or employees;

b. was available to Consultant prior to its disclosure by Client;

c. becomes available to Consultant from a third party who is not, to the knowledge of Consultant, bound to retain such information in confidence.

In the event Consultant is compelled by subpoena, court order, or administrative order to disclose any confidential information, Consultant shall promptly notify Client and shall cooperate with Client prior to disclosure so that Client may take necessary actions to protect such confidential information from disclosure.

13. Subcontracts.

Consultant shall be entitled, to the extent determined appropriate by Consultant, to subcontract any portion of the services to be performed under this Agreement.

14. Suspension of Work.

Work under this Agreement may be suspended as follows:

a. By Client. By written notice to Consultant, Client may suspend all or a portion of the Work under this Agreement if unforeseen circumstances beyond Client's control make normal progress of the Work impracticable.

b. By Consultant. By written notice to Client, Consultant may suspend the work if Consultant reasonably determines that working conditions at the Site (outside Consultant's control) are unsafe, or in violation of applicable laws, or in the event Client has not made timely payment in accordance with Article VI, compensation

15. Termination of Work.

a. This Agreement may be terminated by Client as follows: (1) for its convenience on thirty (30) days' notice to Consultant, or (2) for cause, if Consultant materially breaches this Agreement through no fault of Client and Consultant neither cures such material breach nor makes reasonable progress toward cure within fifteen (15) days after Client has given written notice of the alleged breach to Consultant.

b. This Agreement may be terminated by Consultant as follows: (1) for cause, if Client materially breaches this Agreement through no fault of Consultant and Client neither cures such material breach nor makes reasonable progress toward cure within thirty (30) days after Consultant has given written notice of the alleged breach to Client.

c. Payment upon Termination. In the event of termination, Consultant shall perform such additional work as is reasonably necessary for the orderly closing of the work. Consultant shall be compensated for all work performed prior to the effective date of termination, plus work required for the orderly closing of the work, including: (1) authorized work performed up to the termination date plus termination expenses, including all labor and expenses, at Consultant's standard billing rates, directly attributable to termination; (2) all efforts necessary to document the work completed or in progress; and (3) any termination reports requested by Client.

16. Assignment.

This Agreement is binding on the heirs, successors, and assigns of the parties hereto. Except as otherwise set forth under Article VIII, Assignment of Tasks to Affiliates, this Agreement may not be assigned by Client or Consultant without prior, written consent of the other.

17. No Benefit for Third Parties.

The services to be performed by Consultant are intended solely for the benefit of Client, and no benefit is conferred on, nor contractual relationship established with any person or entity not a party to this Agreement. No such person or entity shall be entitled to rely on Consultant's services, opinions, recommendations, plans, or specifications without the express written consent of Consultant. No right to assert a claim against the Consultant, its officers, employees, agents, or consultants shall accrue to the construction Contractor or to any subcontractor, supplier, manufacturer, lender, insurer, surety, or any other third party as a result of this Agreement or the performance or nonperformance of the Consultant's services hereunder.

18. <u>Force Majeure.</u>

Consultant and Client shall not be responsible for delays caused by circumstances beyond their reasonable control, including, but not limited to: (1) strikes, lockouts, work slowdowns or stoppages, or accidents; (2) acts of God; (3) failure of Client to furnish timely information or to approve or disapprove Consultant's instruments of service promptly; and (4) faulty performance or nonperformance by Consultant or Client, Client's or Consultant independent consultants or contractors, or governmental agencies. Consultant and Client shall not be liable for damages arising out of any such delay, nor shall the Consultant or Client be deemed to be in breach of this Agreement as a result thereof.

19. <u>Integration.</u>

This Agreement represents the entire understanding of Client and Consultant as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties.

20. <u>Severability.</u>

If any part of this Agreement is found unenforceable under applicable laws, such part shall be inoperative, null, and void insofar as it conflicts with said laws, but the remainder of this Agreement shall be in full force and effect.

21. <u>Choice of Law/Jurisdiction.</u>

This Agreement shall be administered and interpreted under the laws of the State of Arizona Jurisdiction of litigation arising from the Agreement shall be in The State of Arizona.

22. <u>Attorneys' Fees.</u>

In the event any claim, controversy, or legal action arises under this Agreement, the prevailing party shall be entitled to recover from the other party all attorneys' fees, costs, expenses and other fees incurred by the prevailing party.

23. <u>Notice Provisions.</u>

Notices concerning this Agreement shall be in writing and sent by certified mail or by courier (such as Federal Express), or by hand-delivery addressed as follows:

To the Company: Arizona Water Company
3805 North Black Canyon Highway
Phoenix, Arizona 85015-5351
Attention: President

or

Arizona Water Company
Post Office Box 29006
Phoenix, AZ 85038-9006
Attention: President

To Consultant: Hansen Engineering & Surveying

115 S. Main Street

Coolidge, AZ 85228

Attention: President

Either party may change its address for purposes of this Section by giving written notice of such change of address to the other party

24. Authorization.

The persons executing this Agreement on behalf of the parties hereto represent and warrant that the parties have all legal authority and authorization necessary to enter into this Agreement, and that such persons have been duly authorized to execute this Agreement on their behalf.

IN WITNESS WHEREOF, each of the parties hereto has caused this instrument to be executed by their respective duly authorized officers as of the date first written above.

HANSEN ENGINEERING & SURVEYING an Arizona corporation	ARIZONA WATER COMPANY, an Arizona corporation
By: [signature]	By: [signature] 10/15/10
Its: Pres.	Its: REAL PROPERTY SPECIALIST

W:\01-AGREEMENTS, DRAFTS, LTRS & DOCS\CONSULTING AGREEMENTS\HANSEN ENGRNG_SURVEYING\101310.DOCX
CB:JRC 1/31/2008 11:01 AM

Professional Engineers & Surveyors
HANSEN
ENGINEERING & SURVEYING
115 S. Main St. Coolidge, AZ 85228
Phone: (520) 723-3261
Fax: (520) 723-3739

Exhibit A

REVISED 10-14-10
Proposal For Survey

Client: Arizona Water Company
Attn: Charles Biggs
Project: Coolidge / Valley Farms Corridor Topo
Date: October 14, 2010

Scope of Services

Project Corridor Survey
Coolidge-Valley Farms, Arizona

COOLIDGE – Exhibit 1

Locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) within the Right-of-Way of the following roads:

- Coolidge Avenue, from Arizona Boulevard to Main Street, South of the R/W centerline
- Lincoln Avenue, from Arizona Boulevard to Main Street, South of the R/W centerline
- Elm Avenue, from Arizona Boulevard to Main Street, The entire width of R/W
- Main Street. from Elm Avenue to Seagoe Avenue. West of the R/W centerline on Main
- Third Street, from Palo Verde Avenue to Elm Avenue, The entire width of R/W

The survey will also show all features 10 feet beyond the Right-of-Way, specifically: Locate all above-ground utilities (including, but not limited to: valves, power poles, guy lines, junction boxes, ditches, canals, etc.) and locate and identify all utility bluestake markings (for underground utilities).

VALLEY FARMS – Exhibit 2

Locate all above-ground structures/improvements (including, but not limited to: curb, gutter, sidewalks, fences, posts, signs, poles, manholes, utility lines, etc.) and locate all utility bluestake markings (for underground utilities) along the Roadway of the following road:

- Moore Road, from Vah Ki Inn Road to McGee Road, The entire width.
- Vah Ki Inn Road, from AWC well site, East to McGee Road, North of the R/W centerline of Vah Ki Inn

The survey will also show all features 10 feet beyond the Roadway, specifically: Locate all above-ground utilities (including, but not limited to: valves, power poles, guy lines, junction boxes, ditches, canals etc.) and locate and identify all utility bluestake markings (for underground utilities).

NOTE: Moore Road is described by centerline and no width is defined (Book 84 of Deeds, Page 164). For the purposes of the survey, the primary survey area will be the width of the road as it exists. The secondary survey area will be 10 feet beyond the width of the road on each side.

ADDITIONAL INFORMATION

Project Location: Coolidge: Northwest quarter Section 27, T.5S.,R.8E.

Project Location: Valley Farms: Northwest quarter Section 20, T.5S.,R.9E.

Deliverables:

1 complete printed set of the survey in its entirety on bond paper
1 compact disc with the electronic files of the survey in its entirety in AutoCAD format

HANSEN
ENGINEERING & SURVEYING
115 S. Main St. Coolidge, AZ 85228
Phone: (520) 723-3261
Fax: (520) 723-3739
Professional Engineers & Surveyors

Exhibit B

Proposal For Survey

Client: Arizona Water Company
Attn: Charles Biggs
Project: Coolidge / Valley Farms Corridor Topo
Date: October 14, 2010

Project Fee

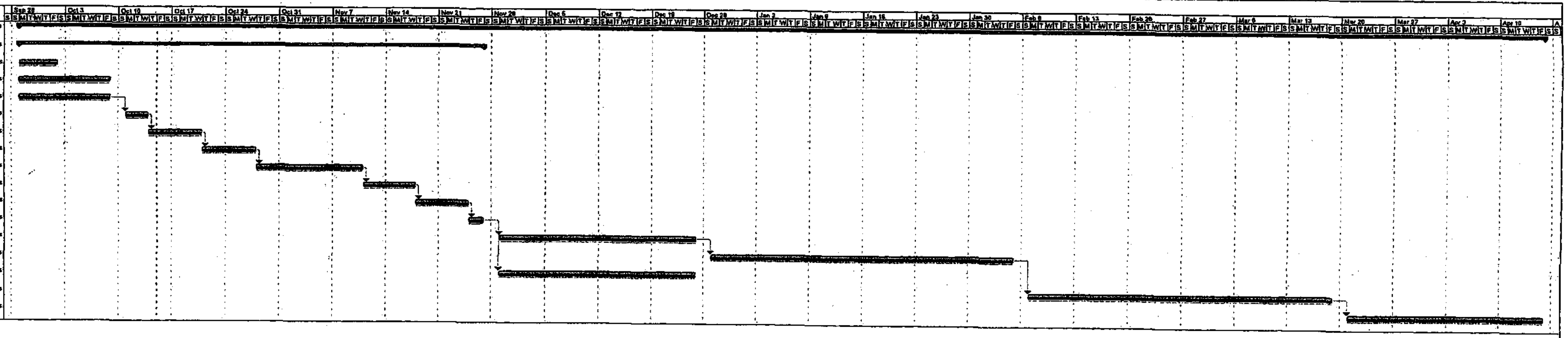
Total fee for services described in Exhibit A	$7,400.00

Standard Time & Material Rates

1MC	= $ 85/Hr
2MC	= $100/Hr
3MC	= $135/Hr
Auto Cad 1	= $ 55/Hr
Auto Cad 2	= $ 60/Hr
Sr. Field Tech	= $ 70/Hr
Engineering Tech 1	= $ 60/Hr
Engineering Tech 2	= $ 70/Hr
Land Surveyor	= $100/Hr
Engineer	= $100/Hr

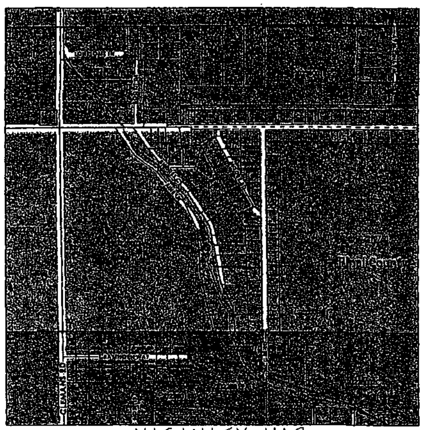
VALLEY FARMS

ID	Task Name	Duration
1	Finish Waterline Project	145 days
2	Waterline Design Drawings	45 days
3	Coordinate New Waterline Location W/Field	5 days
4	Acquire Existing Utility As-Builts	10 days
5	Bid R/W Survey	10 days
6	Consulting Agreement for Survey & MOB	3 days
7	Perform R/W Survey	5 days
8	Develop Base Drawings & Set-up Sheets/Details	5 days
9	Preliminary Design Drawings	10 days
10	Preliminary Drawings to Field for Comment	5 days
11	Final Design Drawings	5 days
12	QA/QC	2 days
13	ADEQ ATC	20 days
14	Pinal County R/W Permit	30 days
15	Bid Waterline Construction & Award Contract	20 days
16	Construction	30 days
17	ADEQ AOC	20 days



Project: Waterline Replacement Desig
Date: Fri 10/15/10

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

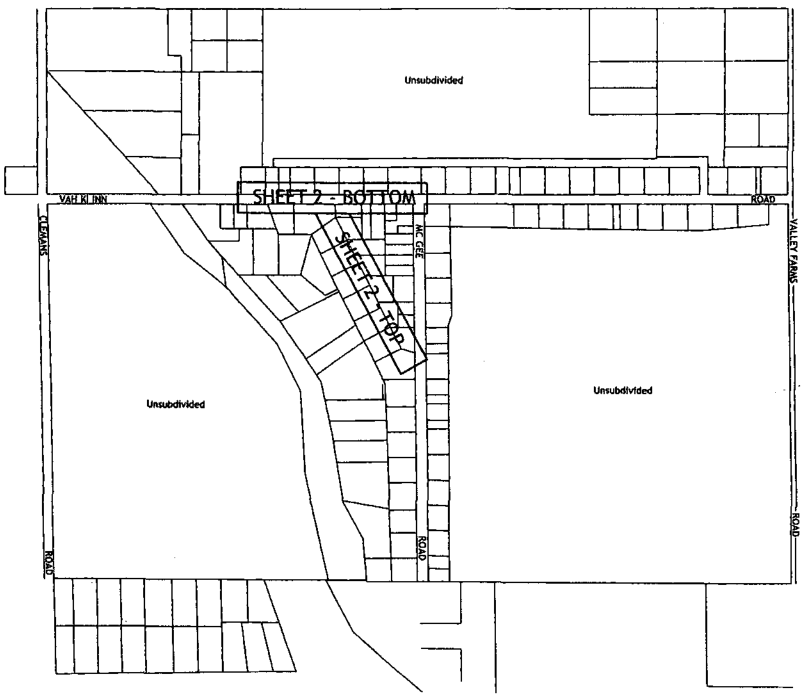


VICINITY MAP

No Scale

REPLACE 2,400 LF OF 6" CA WITH 1,100 LF OF 6" C-900 P.V.C. AND 1,250 LF OF 12" C-900 P.V.C. ON VAH KI INN AND MOORE ROADS IN THE HOMES AREA SUBDIVISION

VALLEY FARMS, AZ



1" = 400'

CONSTRUCTION NOTES:

1. All work and materials shall conform to current County Health Department Standards and Revisions, Arizona Water Company Standard Specifications and Details, MAG Standard Specifications and Details, and Arizona Department of Health Services Engineering Bulletin No. 10.
2. Developer shall obtain a Pinal County Right of Way Use Permit prior to any work being performed within the County right-of-way. Contact Pinal County Public Works Inspection Section at least seven (7) working days.
3. Prior to construction, the appropriate agency(ies) will be notified as required by the permits.
4. All backfill, compaction, and testing shall be per current County, City, State, ADOT and Arizona Water Company Standards and specifications.
5. All water lines 6" and less are to have a minimum cover of 36 inches & all water lines 12" and greater are to have 48 inches of minimum cover over the top of pipe to finish grade, unless otherwise specified on the construction drawings.
6. All frames, covers, valve boxes, and manhole covers shall be adjusted to finish grade prior to completion of construction. (If located outside pavement section, prefer level with finished grade but allow 6" max above finished grade.)
7. All water lines shall be pressure and leakage tested in accordance with AWWA C-600 or MAG 610-14.
8. All water lines are to be disinfected per ADEQ Engineering Bulletin No. 8 and AWWA C651-92.
9. Air release valves are required at water system high points per Arizona Water Company standard details.
10. Water/sewer separation shall be per current Arizona Water Company standards ADEQ AAC R18-4-502-C.
11. It shall be the contractors responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.
12. Any construction performed without the knowledge of the Inspector or his representative is liable for removal and replacement at the contractors expense.
13. In accordance with AAC R18-4-119, all materials added after January 1, 1993 which may come in contact with drinking water, shall conform to National *Sanitation Foundation* Standards 60 and 61.
14. All water services shall be set a minimum of 2 feet on the customers property and NOT in the right-of-way.
15. Unless otherwise specified on the construction drawings, all water mains are to be installed 5 feet from the property line inside the right-of-way or easement.
16. Water valves shall be spaced not more than 500 feet in commercial districts and not more than 800 feet in other districts. Variations may be required for transmission mains or special applications. Sufficient valving is required where water lines cross streams, railroads and major highways.
17. Contractor is responsible for Blue Stake marking daily as construction is in progress.
18. All residents to be notified in person 24 hours prior to driveway crossing.
19. Traffic control and barricading shall be according to the Manual on Uniform Traffic Control Devices or Pinal County requirements. Contractor to supply lighted barricade at 50' intervals with open trench signage.
20. Contractor shall submit a Traffic Control plan to Pinal County Public Works Inspection Section at least three (3) working days prior to work for review and approval.
21. Any work on arterial or collector roads shall require an off-duty Pinal County Sheriff's Officer for traffic control. Contact shall be made through PCSO representative.
22. No trench to be left open/uncovered after working hours unless property signed and barricaded per the approved Traffic Control Plan.
23. Plan approval is Valid for (12) months from the date of County approval. If approval expires, the plans must be resubmitted to Pinal County Public Works for update review and re-approval.
24. Trench excavation, back filling and compaction shall be per MAG Standard Specifications Section 601. Bedding shall be specifically per MAG Standard Specifications 601.4.2 and 601.4.6.
25. All work required to complete the construction covered by these plans shall be in accordance with MAG Standard Specifications and Details.

ADEQ APPROVAL

FILE No ______

______ DATE

RECORD DRAWING CERTIFICATION

I HEARBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

______ REGISTERED ENGINEER/LAND SURVEYOR

______ REGISTRATION NUMBER ______ DATE

QUANTITIES LIST

	ITEM DESCRIPTION	QTY. IN R/W	QTY. TOTAL
	12" C-900 P.V.C. & Related Fittings	1,240 LF	1,250 LF
	6" C-900 P.V.C. & Related Fittings	56 LF	1,100 LF
	12" Resiliant-Wedge Gate Valves, V.B.& C.	3	3
	6" Resiliant-Wedge Gate Valves, V.B.& C.	1	2
	12" x 6" Mechanical-Joint Tee	1	1
	12" 90° Mechanical-Joint Ell	3	3
	17 Short Single Service Tie-Overs	5	17
	8 Long Single Service Tie-Overs	8	8
	1 Long Double Service Tie-Over	1	1
	AC Pavement Replacement	14 SY	14 SY

UTILITY LEGEND

UTILITY	LINE STYLE
Existing Waterline	——6" W——
Abandon Waterline	
New Waterline	
Sewer	——S——
Natural Gas	——G——
Electric	——E——
Telephone/Cable	TELCO

NGS BENCHMARK DETAIL

CZ0391

RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992

1.4 KM (0.85 MI) SOUTHERLY ALONG MAIN STREET (STATE HIGHWAY 287) FROM THE POST OFFICE IN FLORENCE, THENCE 4.1 KM (2.55 MI) SOUTHWESTERLY ALONG CANAL ROAD, THENCE 1.7 KM (1.05 MI) SOUTHERLY ALONG SELLERS STREET, THENCE 1.8 KM (1.10 MI) WESTERLY ALONG VAH KI INN ROAD, IN TOP OF AND 1.2 M (3.9 FT) WEST OF THE EAST END OF THE SOUTH CONCRETE HEADWALL OF A CULVERT, 11.6 M (38.1 FT) WEST OF THE CENTERLINE OF VALLEY FARMS ROAD, 4.5 M (14.8 FT) SOUTH OF THE ROAD CENTERLINE, AND 0.4 M (1.3 FT) ABOVE THE LEVEL OF VAH KI INN ROAD.

APPROVED FOR CONSTRUCTION
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
DATE 12/8/10 BY AA

PINAL COUNTY ENGINEER APPROVAL

APPROVED BY:

______ PINAL COUNTY ENGINEER
PINAL COUNTY, DEPARTMENT OF PUBLIC WORKS ______ DATE

APPROVAL EXPIRES ______ DATE

BASIS OF BEARING

The North line of Section 20, Township 5 South, Range 9 East, G.S.R.B.&M.

S89°56'W

G.L.O Plat 1639 2/12/1930

BENCHMARK

NGS Database
USGS Quad= Valley Farms
PID=CZ0391
NAD83 32°59'18"N
111°26'19.08"W
NAVD88= 1495.58 Feet

SHEET INDEX

Sheet 1 - Cover Sheet
Sheet 2 - Pipeline
Sheet 3 - Construction Specs.
Sheet 4 - Details

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT

W.A. 1-4773	DATE 10.14.2010
SYSTEM	COOLIDGE
LOCATION:	NW1/4 SEC.20- T.5S.,R.9E.
COUNTY	Pinal
SCALE:	Per Plan
DRAWN BY: CB	TAX DIST. 2103

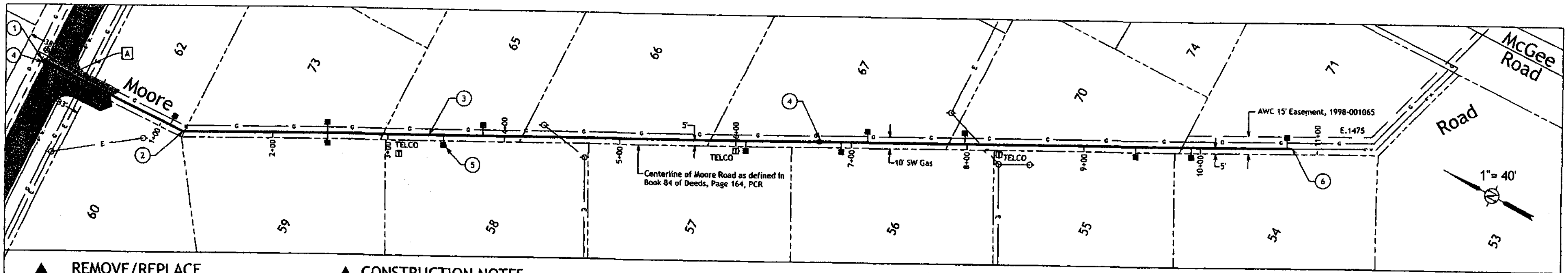
41046 JAMES T. WILSON ARIZONA, U.S.A. Expires 6/30/13

FOR WATER ONLY

ARIZONA WATER COMPANY
3805 N. BLACK CANYON HWY • POST OFFICE BOX 29006
PHOENIX, AZ 85015 PHOENIX, AZ 85038
(602) 240-6860

DESCRIPTION: REPLACE 2,400 LF OF 6" CA WITH 1,100 LF OF 6" C-900 P.V.C. AND 1,250 LF OF 12" C-900 P.V.C. ON VAH KI INN AND MOORE ROADS IN THE HOMES AREA SUBDIVISION

DWG. NUMBER: CL-0355 SHEET: 1 of 4



▲ REMOVE/REPLACE

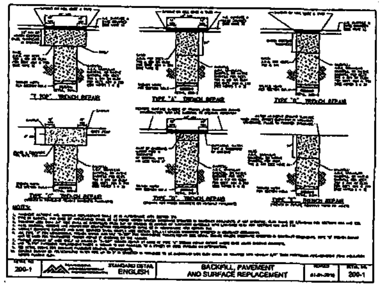
[A] Remove and Replace Existing AC Pavement (7 SY) MAG 200-1 'T TOP'

Tie-Over Existing Service - Typical
12 Short Single Services
Install Services By Bore

NO SEWER

▲ CONSTRUCTION NOTES

1. 12" x 6" MJ Tee (STA.0-23)
2. 6" 22.5° MJ Ell (STA.1+20)
3. Install 1,100 LF of 6" C-900 P.V.C. (0-23 TO 10+78)
4. 6" MJ Gate Valve, V.B.&C. (STA.0-22, 6+72)
5. Tie Over Existing Service, Typ.
6. Tie Into Existing 6" C-900 P.V.C. (STA.10+78)



▼ REMOVE/REPLACE

[A] Remove and Replace Existing AC Pavement (7 SY) MAG 200-1 'T TOP'

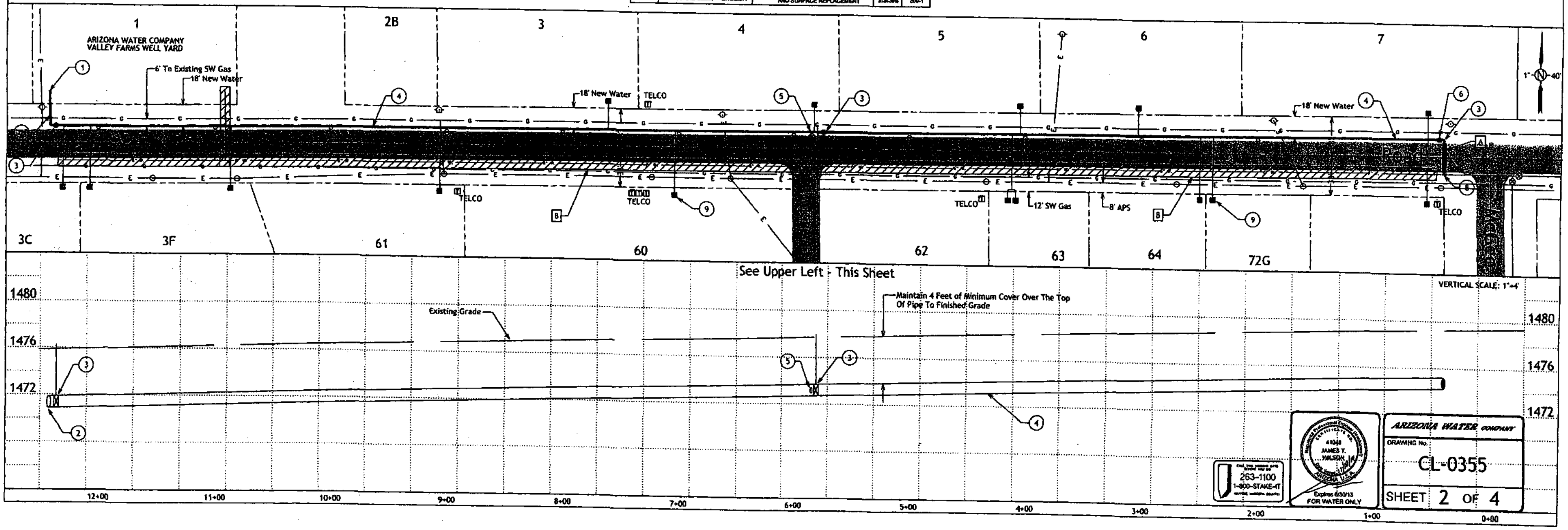
[B] Abandon 1,245 LF of 6" CA Main - See Item 4

Tie-Over Existing Service - Typical
8 Long Single Services
1 Long Double Service
5 Short Single Services
Install Services By Bore

NO SEWER

▼ CONSTRUCTION NOTES

1. Tie Into Existing 12" @ AWC Well Yard
2. 12" 90° MJ Ell (STA.12+41)
3. 12" R.W.G.V., V.B.&C., MJ (STA.0+40, 5+85, 12+40)
4. Install 1,220 LF of 12" C-900 P.V.C. & Related Fittings (STA.0+40 TO 12+41)
5. 12" x 6" MJ Tee (STA.5+84)
6. 12" MJ 90° Ell (0+40)
7. Install 30 LF of 12" C-900 P.V.C. & Related Fittings (0+40)
8. Tie Into Existing 12" w/12" 90° MJ Ell (0+40)
9. Tie Over Existing Service, Typ.



E-8-1
CONSTRUCTION SPECIFICATIONS
FOR THE INSTALLATION OF WATER DISTRIBUTION SYSTEMS
DUCTILE IRON

DEFINITIONS

A. Company. The words "Company" or "Arizona Water Company" mean Arizona Water Company, and where applicable, any division of Arizona Water Company, whose principal place of business is located at 3805 North Black Canyon Highway, Phoenix, Arizona 85015-5351 (Post Office Box 29006, Phoenix, Arizona 85038-9006).

B. Company's Authorized Representative. The words "Company's Authorized Representative" mean any officer of the Company, and any of the Company's Engineers, any Division Manager or Superintendent of the Company and/or such other person(s) designated in writing as the "Company's Authorized Representative" by the President or any Vice President of the Company.

C. Contractor. The word "Contractor" means either an individual or other entity employed to do the work as shown on the Construction Drawings and as specified herein.

D. Construction Drawings. The words "Construction Drawings" mean plans prepared by or on behalf of Arizona Water Company.

E. Contract. The word "Contract" means the written document titled "Proposal/Contract" when such document has been signed by an officer or other authorized representative of both the Contractor and the Company.

1. GENERAL

All work is to be completed in a safe, workmanlike manner and in accordance with these Construction Specifications; any deviation therefrom must be approved in writing by the Company.

Installations must conform with the requirements of all governmental regulating agencies and the cost of conforming to such regulations must be included in the unit bid prices. Examples of such regulations, without attempting to be inclusive, are:

a. Special compaction and paving for street crossing.
b. Shoring when required because of the trench depth.
c. Closing a trench in those areas where no open trench is allowed overnight.
d. Barricading and traffic controls required.

2. LOCATION MARKING

Alignment stakes as required in the opinion of the Company shall be furnished by the Company to the Contractor and shall be set by the Company at agreed upon intervals and offsets. Under normal circumstances these will reference the pipeline location five feet (5') into the right-of-way measured from property pins. Grade stakes will be provided only when the Construction Drawings show a pipeline depth other than covered in these Specifications. It is the responsibility of the Contractor to preserve all survey work.

3. TRENCH EXCAVATION

The trench location is to be determined by the Construction Drawings.

FOR 8-INCH OR SMALLER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between thirty-six inches (36") and forty-two inches (42") of cover unless otherwise specified on the Construction Drawings.

FOR 12-INCH AND LARGER PIPE: The depth of the trench prior to pipe laying shall be such that the finished pipeline shall have between forty-eight inches (48") and sixty inches (60") of cover unless otherwise specified on the Construction Drawings.

The width of the trench at and below the level of the top of the pipe shall be a minimum of twelve inches (12") plus the outside diameter of the pipe barrel and a maximum of twenty-four inches (24") plus the outside diameter of the pipe barrel.

The bottom of the trench shall be accurately graded to provide a uniform bearing for each length of pipe for the full length of the pipe. If the native material on the trench bottom can be reasonably dug by hand, bellholes shall be dug for the joints so that the joints in no way support the pipe. When native materials such as rock are encountered during trenching that will not provide a uniform support for the pipe, the trench will be over-excavated an additional six inches (6") and suitable bedding material will be placed in the trench.

Bedding material will be placed by hand in four-inch (4") lifts and compacted to ensure uniform compaction and to eliminate any voids under the pipe. When the space between the pipe and trench bottom varies, this must be backfilled and compacted in four-inch (4") lifts to the mid-section of the pipe.

Whenever the trench is over-excavated for whatever reason, the trench bottom will be brought up to the correct depth at the Contractor's expense using either method (a) or (b) as follows:

a. A.B.C. material shall be used and compacted to a uniform density of not less than 80% of the maximum density as determined by AASHTO T-99 method A and T-191.

b. Native material 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen shall be used and compacted to a uniform density of not less than 85% of the maximum density as determined by AASHTO T-99 method A and T-191.

4. MATERIALS TO BE PROVIDED BY CONTRACTOR

Unless otherwise specified on the Construction Drawings or in the Contract, the Contractor will supply all of the necessary materials which will become a permanent and integral part of the water distribution system, including concrete blocking, anchors, backfill material, paving material and supplies used during the prosecution of the work. All materials provided by the Contractor to construct the water distribution system must be NSF Standard 61 approved. All potable water pipes and fittings shall have NSF-PW seal. Construction materials used in the water system shall be lead free as defined at AAC R28-4-504 and R18-1-101. The Contractor will provide the following materials:

a. FIRE HYDRANTS: Mueller Super Centurion 250 Fire Hydrant, meets ANSI/AWWA C502 Standard, Model No. A-423, 5-1/4" main valve opening, three way, 6" Mechanical Joint Shoe, 1-1/2" pentagon operating nut, color - yellow, drain open, open direction - left, 4' or 4'-6" bury depending on application. For pumper and hose nozzle information see below.

(1) One - 4" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Ajo, Casa Grande, Coolidge and San Manuel.)

(2) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NST. (These locations only: Apache Junction, Arizona City, Lakeside, Oracle, Overgaard, Pinewood, Rimrock, Sedona, Sierra Vista, White Tank and Winkelman.)

(3) One - 4-1/2" Pumper Nozzle, NST and Two - 2-1/2" Hose Nozzles, NPT (Bisbee only.)

(4) One - 3" Pumper Nozzle GA 6-350 (6 threads per inch, 3.50 pitch diameter) and Two - 2-1/2" Hose Nozzles, NPT (Miami only.)

(5) One - 3-1/2" Pumper Nozzle GA 6-411 (6 threads per inch, 4.11 pitch diameter) and Two - 2-1/2" Hose Nozzle, NST (Superior only.)

b. FITTINGS: Manufactured by Tyler or Union. Crosses, Elbows, Tees, Cap, Reducer, Adaptor, Plug, Blind Flange and Tapped Flange: Ductile Iron, Class 350, SSB, Cast Iron Cement Lined.

(1) Foster Adaptors for MJ, made by Infact Corporation: Available in size 4" to 16", Part No. 4" - 4FA-BC, 6" - 6FA-BC, 8" - 8FA-BC, 10" - 10FA-BC, 12" - 12FA-BC, 16" - 16FA-BC.

c. DETECTOR CHECK VALVE: Mueller/ Hersey EDC III, iron body, including 5/8" x 3/4" Trim Kit. Trim Kit Part No.: 4" - 282080, 6" - 282082, 8" - 282085, 10" - 282496.

d. GATE VALVES: Mueller Resilient Wedge Gate Valves, meets AWWA C509 specification, 250 psig, Non-rising stem, Part No. A-2360 sizes 4" through 12" ; Part No. A-2361 sizes 14" through 36", low zinc stems, epoxy coated inside and outside to meet the NSF 61 rating. The bonnet and stuffing box shall have 304 stainless steel bolts/nuts.

e. TRACER WIRE and WARNING TAPE:

(1) TRACER WIRE: Shall be direct bury AWG #14 solid copper wire, Color: Blue.

(2) WARNING TAPE: Reef Industries, Standard Terra Tape in 3" widths. Color: Blue and imprinted 'Arizona Water Company'.

f. AIR RELEASE VALVE: Crispin Model AR10 with 1" NPT inlet and 1/2" NPT outlet, cast iron body and top flange: with a 5/64" orifice with stainless steel valve seating faces and BUNA-N rubber.

g. PRESSURE RELIEF VALVE: Watts 174A, Model M, 2" inlet, 2" outlet, Bronze Body, 30lb. to 150lb. pressure range.

h. MEGALUG: Mechanical Joint restraint made of ductile iron conforming to ASTM 536-80, 250 psi made by EBAA Iron, Inc., series 1100 or equal.

i. METER BOXES:

(1) Concrete Box with a steel regular lid, Number 1: Tucson specification.

(2) Concrete Box with a steel regular lid, Number 2, 3, and 4: Phoenix specification.

j. PIPE, COPPER: Type K soft copper in 60 or 100-foot coils, per ASTM B88.

k. PIPE, DUCTILE IRON: Ductile Iron Pipe, Cement Lined, Push-on, conform to current ANSI/AWWA Specification A21.51/C151, Pressure Class 350 (sizes 4" through 12"), Pressure Class 250 (sizes 14" through 20"), or Pressure Class 200 for 24" through 36" pipe. Vendors:

(1) Pacific States Cast Iron Pipe Company
(2) Griffin Pipe
(3) United States Pipe and Foundry Company
(4) American Ductile Iron Pipe
(5) Clow Pipe (McWane, Inc.)

l. PIPE, PLASTIC: Plastic pipe, C-900 PVC per ANSI/AWWA C900, Class 150, sizes 6" through 12". NSF61 approved. Furnished in laying lengths of 20'. The barrel shall conform to the outside dimensions of steel pipe (IPS) or cast iron (CI) pipe equivalent and the wall thickness of dimension-ratio (DR) 18.

m. POLYETHYLENE ENCASEMENT (Polywrap): For all pipeline and related fittings installed, EXCEPT for the Coolidge Division. Minimum 8 Mil. and installed per AWWA C105/A21.5-93 and ASTM A-674-89. Manufactured by the Pacific States Cast Iron Pipe Company. The wrapping tape shall be minimum 10 mil. vinyl tape. No duct tape shall be used.

n. COUPLING: Mueller, straight three part union, tested to meet ANSI/AWWA C800, H15403, conductive compression.

Mueller, H15428, straight coupling, conductive compression by male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Mueller, H15451, straight coupling, conductive compression by female iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 2".

Viking Johnson brand, sold by Mueller: MaxiFit Straight (2"-24"), MaxiFit Ultra Straight (4"-8") or MaxiStep Transition, tested to meet AWWA/ANSI C.219-91 specifications - certified to ISO 9001:1994 / Smith - Blair Quantum.

o. STOP, ANGLE METER, BALL: Mueller, valve, B24258, conductive compression by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8 " x 3/4" x 3/4" for a 3/4" service or size 1" for a 1" service.

Mueller, valve, B24265, female pipe thread by meter swivel nut, tested to meet ANSI/AWWA C800, size 5/8" x 3/4 " x 3/4 " for a 3/4" service or size 1" for a 1" service.

p. STOP, CORP: Mueller, ball valve, B25008, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specification, sizes: 3/4", 1" and 2".

Mueller, ball valve, B25028, iron pipe thread by conductive compression, tested to meet ANSI/AWWA C800 specification. Sizes 3/4", 1", and 2".

Mueller, 300 Ball Curb Valve, B-25122, taper thread by conductive compression, tested to meet ANSI/AWWA C800 specifications, size: 2". (2" service)

q. STOP, CURB: Oriseal valve, H10291, iron pipe thread by iron pipe thread, quarter turn check, brass, tested to 300 psi working pressure, tested to meet ANSI/AWWA C800 specification, size: 2".

Mueller, B20283, Mueller 300 ball curb valve, female iron pipe by female iron pipe, quarter turn check, tested to meet ANSI/AWWA C800 specification. Size: 2". (Blow-off E-9-6-1).

r. TAPPING SADDLE: Smith Blair, Cast Bronze ASTM-B584 85-5-5-5, double strap, iron pipe threads, Models 321 and 323. Washers are silicon bronze, ASTM-B36. Gaskets are grade 60 Buna N, or Mueller bronze double strap service saddle, BR 2 B series, cast bronze, ASTM-B585, 85-5-5-5, or H16084, 200 psig, meets ANSI/AWWA C800.

s. TAPPING SLEEVE: Mueller H304 Stainless Steel Tapping Sleeve, JCM 432 18 8 Type 304 Stainless Steel Tapping Sleeve, Romac "SST" Type 304 Stainless Steel Tapping Sleeve or CASCADE-style CST-EX stainless steel pressure-rated tapping sleeve.

t. TAPPING VALVE: Mueller Resilient Wedge tapping valve, Catalog Number T-2360-16, Class 125, sizes 4" through 12": T-2361-16, Class 125, sizes 14" to 36" all with Type 304 stainless steel fasteners: bypass valves are required on 18" - 36" valves flange by mechanical joint per ANSI/AWWA C111, iron wedge, non-rising stem. Epoxy coated interior/exterior per ANSI/AWWA C550 for NSF 61 compliance. 250 PSI range for valves 4" to 12". 150 PSI range for valves 14" to 36".

u. U-BRANCH: Mueller, H15364, 1" male iron pipe by 3/4" male iron pipe, tested to meet ANSI/AWWA C800 specification. Size: 1" x 3/4" x 13-1/2", straight line.

v. VALVE BOXES: Valve Box with Cover, adjustable, Tyler 562-A or equal, made of cast iron.

w. VAULTS: Utility Vault Company, Chandler, AZ.

(1) 4484-WA concrete vault with a 3660 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

(2) 575-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knock outs and adjustable frame.

(3) 612-5X-WA concrete vault with a 4874 aluminum double torsion door with a recessed padlock hasp, two - 18" x 24" center knockouts.

x. VALVE, METER: Mueller, B24285-1, Mueller 300 ball angle meter valve, female iron pipe by meter nut, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

Mueller, B25170, Mueller 300 ball straight valve, conductive compression by female iron pipe, quarter turn check, lock wing, tested to meet ANSI/AWWA C800 specification. Size: 1".

y. YOKES, METER: Relocator type copper meter yoke with horizontal inlet and outlet and meter thread ends, B24118, with lock wing Mueller 300 angle ball valve, full port, sizes: 1" x 12", 5/8" x 3/4" x 7", 5/8 x 3/4" x 9".

Mueller, 2" copper meter yoke with horizontal inlet and outlet and female iron pipe threads, B2423-99000, with lock wing Mueller 300 ball angle meter valves on inlet and outlet risers. Raised 1" by-pass with lock wing Mueller 300 ball valve.

The Contractor also will be required to provide the following materials, the cost of which will be included in its unit bid price:

All material and concrete for thrust blocks, other anchors, reinforcing steel: all gravel, crushed stone, A.B.C., earth, sand, or screened material which may be required: all material for bracing and shoring trenches and for construction of forms: all barricades and traffic control equipment: all material for paving replacement and any water used for compaction of backfill.

5. INSTALLATION OF MATERIALS

All materials are to be installed in accordance with manufacturers recommendations unless otherwise directed by these Specifications.

All pipe, fittings and valves shall be laid true to the lines, grades and locations established by the Specifications and the Construction Drawings.

The ends and inside of the pipe shall be thoroughly cleaned and inspected for damage. No damaged materials shall be installed in the water distribution system.

Whenever the work ceases for any reason, all open pipeline ends shall be tightly plugged by the Contractor. Plugs shall be watertight and approved by the company.

Concrete thrust blocks of the sizes required by the plans and specifications are to be provided at all valves, changes in direction or size, or at any other point where an unbalanced thrust due to water pressure would exist. Thrust blocks are to be formed to prevent any concrete from spilling over or into a joint.

Trench curves as shown on the Construction Drawings may be made without fittings when using push on joint pipe up to twelve inches (12") in diameter, if the deflection of the pipe does not exceed five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length of pipe. The minimum radius of such curves will be two hundred five feet (205').

Prior to construction, the appropriate agency(ies) will be notified as required by the permit(s).

It shall be the Contractor's responsibility to uncover all existing water lines being connected to, and to verify the location, depth and size of pipe before any construction begins.

Any construction performed without the knowledge of the duly authorized representative is liable for removal and replacement at the Contractor's expense.

All fire hydrants, frames, covers and valve boxes, etc. shall be adjusted to finished grade prior to the placing of the asphalt concrete surface course by the Contractor (where applicable).

Air release valves shall be installed at water system high points per Standard Detail E-9-8-2.

All water services shall be set a minimum of two feet (2') on the customer's property, preferably within the P.U.E. and not within right-of-way.

Unless otherwise specified on the construction drawings, all water mains shall be installed five feet (5') from the property line inside the right-of-way or easement.

Water valves shall be spaced not more than five hundred feet (500') in commercial districts and not more than eight hundred feet (800') in other districts. Variations may be required for transmission mains or special applications.

Installation of water line casing shall be per Standard Specification E-9-24-1.

Tracer Wire and Warning Tape are to be installed on all mains, tees, crosses, ells and fire hydrant laterals. They will not be installed on service lines. The tracer wire will be installed on the water main 45 degrees from the vertical centerline of the pipe and shall be taped to the fittings directly and on the main every 10 feet using a minimum 10 mil vinyl tape. The tracer wire shall be placed between the valve riser and box with a minimum of 12" of wire inside. The warning tape shall be installed a minimum of two feet below the surface, being measured from final grade, directly over the center of the pipe. Any splices in the tracer wire shall be joined using waterproof connectors. Any splices in the warning tape shall be joined using minimum 10 mil vinyl tape. The tracer wire shall be tested for continuity after backfill and compaction, but before paving. Any detected damages to the wire shall be repaired before paving will be allowed.

6. BACKFILL OF WATER MAIN TRENCHES

Backfill of any excavation shall conform to the requirements of any of the governmental agencies having jurisdiction over the location. If no governmental agency having such jurisdiction specifies backfill or compaction requirements, and no special requirements are shown on the Construction Drawings, the procedure set forth in this section will apply for water line trenches.

The bedding material above the pipe and backfill material shall be compacted to a minimum of 70% compaction within a utility easement and 80% compaction within a right-of-way as determined by AASHTO T-99 method A and T-191. If water setting is used for compaction, it is the responsibility of the Contractor to prevent the pipe from floating.

The bedding material shall be either native material, 100% of which will pass through a one and one-half inch (1-1/2") screen and at least 20% of which will pass through a number-8 screen, or imported material which conforms to M.A.G. specifications for A.B.C. or type-B select materials. Bedding material shall be used below and around the pipe and a minimum of twelve inches (12") above the pipe. Shade and bedding material to be mechanically compacted prior to remainder of trench back-fill.

The remainder of the trench shall be backfilled with native or imported material which shall be of sound earthen material free from broken concrete, wood, broken pavement, or other unsuitable substances. Except as otherwise specified, backfill may be material containing no pieces larger than six inches (6") in greatest dimension.

Where settlement occurs, additional backfill material shall be placed and compacted and the trench shall be brought to final grade.

7. HYDROSTATIC TESTING OF COMPLETED PIPELINES

Hydrostatic testing of water pipelines will be completed before the new system is connected into the existing water system so that all testing can be done against all new materials.

The completed section of water pipeline to be tested shall be slowly filled with water with care being taken to expel all air from the pipe. If necessary, the pipe will be tapped at high points to vent air.

The Contractor shall provide all equipment and labor necessary to accomplish this testing and the price shall be included in the unit prices. The Contractor shall notify the Company in advance of the testing so that the Company can schedule a duly authorized representative to be at the site during testing. The Contractor, at its own expense, shall make any necessary repairs to the system being tested in order to cause the section being tested to meet the test limits set below. The Contractor may request authorization of the Company to connect the new pipelines to the existing system prior to completion of pressure testing when, in the Company's sole opinion and judgment, conditions warrant such connection.

The Contractor shall assume all responsibility to complete pressure testing to Company's specifications after such connection, including, but not limited to, isolation of the new pipelines from the existing system, if necessary.

Connections prior to completion of pressure testing shall not be made unless prior Company authorization has been obtained, and any extra expenses resulting from such connections shall be the sole responsibility of the Contractor.

Leakage tests will be for a period of two hours at 200 + or - 5 psi at the point of lowest elevation: leakage may not exceed 0.1 gallons per hour per one thousand feet (1,000') of pipe per inch of diameter. If dry utilities are not installed, a second pressure test is required.

8. STERILIZATION AND FLUSHING OF COMPLETED WATER PIPELINES

Sterilization and flushing will conform to recommendations of Arizona State Department of Health Services Engineering Bulletin Number 8, latest edition, or any future Arizona Department of Environmental Quality bulletins. Contractor to follow all conditions of any discharge permit.

9. NO OTHER UTILITIES ALLOWED IN OR NEAR WATER PIPELINE TRENCHES

No other utility installations will be permitted in the water pipeline trench or within five feet (5') of the Company's water pipeline when running parallel to the water pipelines.

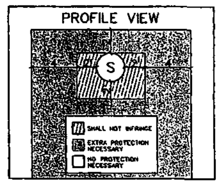
10. PROTECTION OF WATER MAINS NEAR SEWERS

In order to protect water mains from contamination by sewers, the installation of the water mains must conform to the following requirements:

a. Horizontal - When water lines and sewers are laid parallel with each other, the horizontal distance between them shall not be less than six feet (6'). Each line shall be laid on undisturbed or bedded material in a separate trench. Where conditions prevent the minimum horizontal separation set forth above, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department. Refer to the diagram below for clarification.

PROFILE VIEW



Under no circumstances will the horizontal separation between sewer mains and water mains be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main.

b. Vertical - When a water main is parallel with or crosses a sewer main within two feet (2') above the sewer or greater than two feet (2') below the sewer, extra protection will be required. Extra protection shall consist of constructing the sewer main with mechanical joint ductile iron pipe or with slip-joint ductile iron pipe if joint restraint is provided, or encasing both water and sewer main in concrete. See AWC Standard Detail E-9-30-1 and E-9-30-2.

The Construction Drawings shall indicate the installation requirements. The drawings showing these exceptions shall have been approved by the appropriate state and/or county health department.

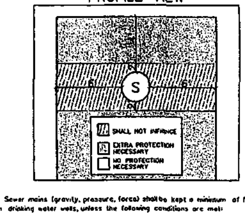
Under no circumstances will the vertical separation of a sewer main installed above a water main be less than two feet (2'). All distances are to be measured from the outside of the sewer main to the outside of the water main. Refer to the diagram above for clarification.

c. When unusual conditions such as, but not limited to, highway or bridge crossings prevent the water and sewer main separations required from being met, the appropriate state and/or county health department will review and may approve requests for authorization to use alternate construction techniques, materials and joints on a case-by-case basis.

d. No water pipe shall pass through or come into contact with any part of a sewer manhole. The minimum horizontal separation between water mains and manholes shall be six feet (6'), measured from the center of the manhole.

e. The minimum separation between force mains or pressure sewers and water mains shall be two feet (2') vertically and six feet (6') horizontally under all conditions. Where a sewer force main crosses above, or less than six feet (6') below, a water line, the sewer main shall be encased in at least six inches (6") of concrete for ten feet (10') on either side of the water main. Refer to the diagram below for clarification.

PROFILE VIEW



f. Sewer mains (gravity, pressure, force) shall be kept a minimum of fifty feet (50') from drinking water wells, unless the following conditions are met:

1. Water main pipe, pressure tested in place to 50 psi without excessive leakage, may be used for gravity sewers at distances greater than twenty feet (20') from drinking water wells.

2. Water main pipe, pressure tested in place to 150 psi without excessive leakage, may be used for pressure sewers and force mains at distances greater than twenty feet (20') from drinking water wells.

g. No septic tank/disposal field system shall be constructed within one hundred feet (100') of a drinking water well.

h. All distances are measured perpendicularly from the outside of the sewer main to the outside of the water main. These separation requirements do not apply to building, plumbing or individual house service connections.

i. Use Mechanical Joint ductile iron pipe with Megalug thrust restraints a minimum of ten (10') feet on each side of a sewer or storm drain crossing.

11. COMPACTION

When crossing existing water mains a minimum of 95% compaction is required to the bottom of existing mains.

Arizona Water Company requires that no slurry be permitted to contact existing cement/asbestos or ductile iron pipes, unless authorized by the company. Slurry may be poured in the bottom of the sewer trench stopping three inches (3") below the existing water main. The backfill used around the main should be AB in sufficient depth to prevent slurry from contacting existing main.

12. WATER MAIN MATERIAL SPECIFICATIONS

Ductile Iron pipe (Push-on type) minimum class 350, cement lined and conform to AWWA C151.

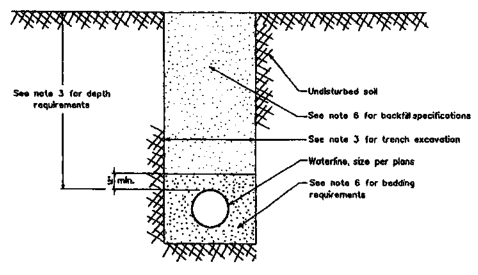
All main line valves shall conform to AWWA C500 with a minimum working pressure of 200 psi.

All cast iron fittings to be cement lined in accordance with AWWA C104 and shall conform to AWWA C110 with a minimum working pressure of 250 psi. Except for the Coolidge System - See Note 4L.

Maximum joint deflection for 6" mechanical joint ductile iron pipe is seven degrees, seven minutes (7°,7') or twenty-seven inches (27") per eighteen-foot (18') length pipe, for a maximum curve of one hundred forty-five feet (145').

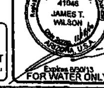
Maximum joint deflection for 8" and 12" mechanical joint ductile iron pipe is five degrees, twenty-one minutes (5°,21') or twenty inches (20") per eighteen-foot (18') length pipe, for a maximum curve of one hundred ninety-five feet (195').

Maximum joint deflection for 6", 8" and 12" push-on joint ductile iron pipe is five degrees (5°) or nineteen inches (19") per eighteen-foot (18') length pipe for a maximum curve of two hundred five feet (205').



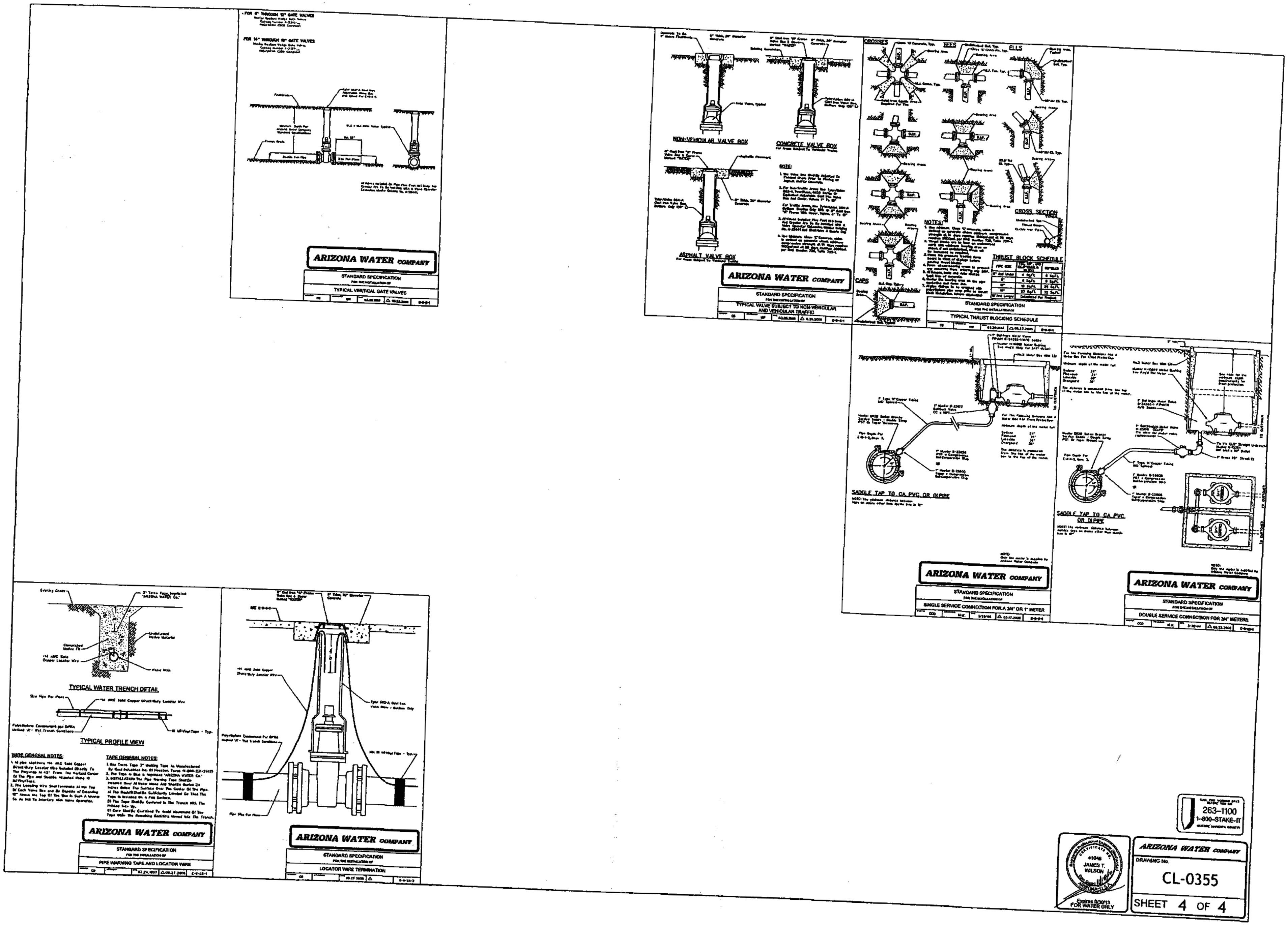
TYPICAL TRENCH DETAIL
Per MAG Detail 601, 601.4.2, 601.4.6

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT



Expires 6/30/13
FOR WATER ONLY

ARIZONA WATER COMPANY
DRAWING No.
CL-0355
SHEET 3 OF 4



ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL VERTICAL GATE VALVES
NON-VEHICULAR VALVE BOX
CONCRETE VALVE BOX
ASPHALT VALVE BOX
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
TYPICAL VALVE SUBJECT TO NON-VEHICULAR AND VEHICULAR TRAFFIC
CROSSES
TEES
ELLS
CAPS
CROSS SECTION
NOTES:
THRUST BLOCK SCHEDULE
STANDARD SPECIFICATION
TYPICAL THRUST BLOCKING SCHEDULE
SADDLE TAP TO CA, PVC, OR DI PIPE
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
SINGLE SERVICE CONNECTION FOR A 3/4" OR 1" METER
SADDLE TAP TO CA, PVC, OR DI PIPE
ARIZONA WATER COMPANY
STANDARD SPECIFICATION
DOUBLE SERVICE CONNECTION FOR 3/4" METERS
TYPICAL WATER TRENCH DETAIL
TYPICAL PROFILE VIEW
WIRE GENERAL NOTES:
TAPE GENERAL NOTES:
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STANDARD SPECIFICATION
PIPE WARNING TAPE AND LOCATOR WIRE
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LOCATOR WIRE TERMINATION
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SHEET 4 OF 4