ORIGINAL

0000133207

ARIZONA WATER COMPANY
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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 AND FOR CERTAIN RELATED APPROVALS BASED THEREON.

Docket No. W-01445A-08-0440

CERTIFICATE OF FILING COMPLIANCE ITEM

The Arizona Corporation Commission, in Decision No. 71845 (the "Decision") at page 93, lines 3-8, ordered Arizona Water Company (the "Company"), under the circumstances therein detailed, to submit a detailed cost analysis and explanation demonstrating why reducing water loss for each of its systems to less than 10 percent is not cost effective. Such water loss report (the "Water Loss Report") was further ordered to be filed with Docket Control as a compliance item in this docket no later than December 31, 2011.

Accordingly, the Company is now filing with Docket Control the Water Loss Report which is attached hereto as attachment A.

RESPECTFULLY SUBMITTED this 30th day of December, 2011.

ARIZONA WATER COMPANY

By: _____
Robert W. Geake
Vice President and General Counsel
Arizona Water Company
P. O. Box 29006
Phoenix, AZ 85038
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CERTIFICATE OF SERVICE

An original and thirteen (13) copies of the foregoing were delivered this 30th day of December, 2011 to:

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 December, 2011 to:

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Assistant Chief Administrative Law Judge
Hearing Division
Arizona Corporation Commission
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Phoenix, Arizona 85007

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By: _____

A REPORT ON ARIZONA WATER COMPANY'S PLAN TO REDUCE WATER LOSSES

Water Systems Evaluated in this Report

PWSID No. 11-707	Coolidge Airport
PWSID No. 09-018	Pinetop Lakes
PWSID No. 09-004	Overgaard
PWSID No. 04-002	Miami
PWSID No. 13-046	Rimrock
PWSID No. 02-001	Bisbee
PWSID No. 03-002	Pinewood

Prepared By: Arizona Water Company
3805 N. Black Canyon Highway
Phoenix, AZ 85015

Date: December 30, 2011

1.0 EXECUTIVE SUMMARY

This report on Arizona Water Company's (the "Company") Plan to Reduce Water Losses was prepared for the Company's water systems that had not achieved a water loss rate of less than 10 percent by July 1, 2011, pursuant to Arizona Corporation Commission (the "Commission") Decision No. 71845, dated August 25, 2010. The Commission directed the Company to evaluate these water systems and prepare a report demonstrating how the Company plans to reduce water losses to less than 10 percent, or why it is not cost effective to do so in Decision No. 71845. Water systems with water losses greater than 10 percent, which are the subject of this report, include the Coolidge Airport, Pinetop Lakes, Overgaard, Miami, Rimrock, Bisbee and Pinewood water systems.

The Company has made a significant effort to reduce water losses by monitoring its water systems, detecting and repairing leaks, replacing infrastructure, performing meter maintenance and selecting the most appropriate meters for each application. This report shows that the frequency of water main and service line leaks and breaks is increasing due to the effects of aging and that failing water mains and services should be replaced.

There are over 320 miles of water mains currently in service in the seven water systems contained in this report. Different types of materials have been used for water mains throughout the past 100 years, with steel, galvanized steel, cast iron, cement asbestos and ductile iron pipe first used in the 1900s, 1910s, 1920s, 1930s and 1986, respectively. Ductile iron pipe has been used almost exclusively for new water main installations since 1986. Other less common types of water mains have also been used, but account for only a small percentage of water mains installed in these water systems.

The seven systems contained in this report currently have over 15,600 active water service connections. Different types of materials have also been used for water service lines including copper, galvanized steel, polybutylene, polyethylene and PVC; with the newest water service lines made from copper materials.

Water mains and service lines must be monitored and repaired to manage and minimize water losses. The Company's highly trained employees use state-of-the-art leak detection equipment to identify the sources of such water losses and follow up with repairs or replacements of leaking water mains and service lines. However, for several water systems aging water mains and water service lines are failing faster than the Company's ability to locate and repair leaks and breaks at current rates of replacement.

The Company has concluded that a more aggressive distribution infrastructure replacement program is needed to further reduce water losses. The Company estimates that it will cost $84 million to replace water mains and service lines that are at or nearing the end of their useful lives for these seven water systems alone. Because of the enormity of this additional level of capital expenditure, the Company is requesting that the Commission authorize the establishment of a Distribution System Improvement Charge ("DSIC") (*See* Attachment 1) for all of its water systems. A DSIC will enable the Company to replace critical infrastructure with gradual changes in rates. Without the approval of a DSIC, the Company cannot adequately replace aging infrastructure critical to the Company's compliance with the Commission's directives in Decision No. 71845.

Although the magnitude of the infrastructure replacement program is quite large, and the solutions will require a long-term commitment, the Company needs to start now in order to make additional progress towards replacing aging and failing infrastructure.

2.0 PURPOSE

In Commission Decision No. 71845, dated August 25, 2010, the Commission directed the Company to do the following:

> "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."

One purpose of this report is to demonstrate how, after evaluating its water systems, the Company plans to reduce water losses to less than 10 percent for its water systems that, by July 1, 2011, had not achieved a water loss rate of less than 10 percent pursuant to Commission Decision No. 71845.

A second purpose is to provide a detailed cost analysis and explanation demonstrating that reducing water losses to less than 10 percent for the Company's Pinetop Lakes, Overgaard, Miami, Rimrock, Bisbee and Pinewood water systems is not cost effective.

A third purpose is to identify, describe and document the extraordinary circumstances that prevent the Company from reducing water losses to 15 percent for its Rimrock, Bisbee and Pinewood water systems.

This report also focuses on the necessity of a surcharge mechanism to address the Company's replacement of aging and failing water mains and service lines. A DSIC will enable the Company to replace its failing infrastructure with gradual increases in rates, thereby providing greater rate stability and avoiding steep increases in rates.

3.0 MEASURES TO IDENTIFY AND REDUCE WATER LOSSES TO LESS THAN 10 PERCENT

This section focuses on measures the Company uses to reduce water losses for the seven water systems that are the subject of this report.

3.1 Locating and Detecting Leaks

Company meter readers report service line and water main leaks and breaks they observe while reading meters. In reporting leaks and breaks, meter readers provide real time information from which timely repairs can be made. As part of their routine duties, meter readers visually inspect the entire water system for leaks and breaks. When a meter reader observes a leak or break, the information is entered into a handheld meter-reading device and then downloaded. Each local office generates a service order from each leak or break that is

reported. If the leak or break requires immediate attention, the meter reader immediately contacts the local office to dispatch a repair crew. In this manner, the repair of leaks and breaks can be started even before the meter readers complete their normal shift.

3.1.1 Leak Detection Equipment

In addition to visual inspections conducted by meter readers, the Company uses three complementary types of leak detection equipment which help the Company's employees identify the location of water leaks more efficiently than other more labor-intensive methods.

The first type of leak detection equipment is a listening device, such as an acoustic noise amplifier or a geophone. The acoustic noise amplifier is a highly sensitive electronic set of "earphones" equipped with signal amplifiers and noise filters to isolate water leak sound vibrations from extraneous background noise. While the acoustic noise amplifier is usually placed on the surface of the ground above the water main, it can also be placed in contact with meters or valves or directly onto the water main. In addition to a disc-shaped listening device, many models can be fitted with a listening "rod" to make contact with meters, valves or water mains otherwise inaccessible and help to locate the source of the leak more precisely.

Geophones are similar to an acoustic noise amplifier, but are mechanical devices and work in much the same manner; i.e. the listening device is placed on the surface of the ground or above the water main and the operator listens for the sound of a leak.

Another type of leak detection equipment, the digital leak detection logger, uses multiple data loggers to survey a larger portion of the distribution system to locate potential leaks that would otherwise go undetected by visual inspection or through the use of other less technological types of listening devices. Each data logger is used in conjunction with other data loggers to collect leak noise data during low noise times (such as between midnight and 3 a.m.) when water use and traffic noises are at a minimum. The use of multiple data loggers helps to triangulate the locations of suspected leaks identified by each data logger used.

The digital leak detection logger uses up to eight data loggers strategically placed on valves, fire hydrants, water meters or directly on the water mains throughout the water system. The data loggers are programmed to communicate with each other at three scheduled time intervals to listen for the sound of any leaks. The information is then downloaded and analyzed to determine if there was any leak "noise" identified between the loggers. If a leak noise is identified, a "correlation spike" will present itself in the data. The operator then inputs the pipe size, material type and distance between the loggers into the laptop and the location of the leak is displayed.

The third type of leak detection equipment, the digital leak correlator, is used to pinpoint the location of the leak noise on a real-time basis, as well as confirming or validating locations of suspected leaks identified through surveys conducted by using a digital leak detection logger, acoustic noise amplifier and/or geophones.

The digital leak correlator system consists of one main processor and two signal transmitters. The main processor receives and processes signals from two transmitters, which are placed on valves, fire hydrants or water meters by a special sensor-mounting device, or directly on the water main itself. When searching for or pinpointing leaks the size, material type and length of each section of pipe that is located between the transmitters must be entered

into the main processor. If leak noise is observed, a spike appears on the main processor screen and the calculated distance from the leak to each of the transmitters is displayed.

The Company's employees use digital leak correlators to confirm the validity of the data generated by the main processor by moving the transmitters to different locations, which can help to confirm or validate the original reported location of the leak. When comparing the location of the suspected leak determined from each leak noise or spike correlation, locating or predicting the same point of leak confirms with greater accuracy the point where repair crews should begin to focus their efforts and excavate for repairs.

The Company has several or more of each type of leak detection equipment throughout its water systems as shown in Table 3.1.

Table 3.1: Leak Detection Equipment

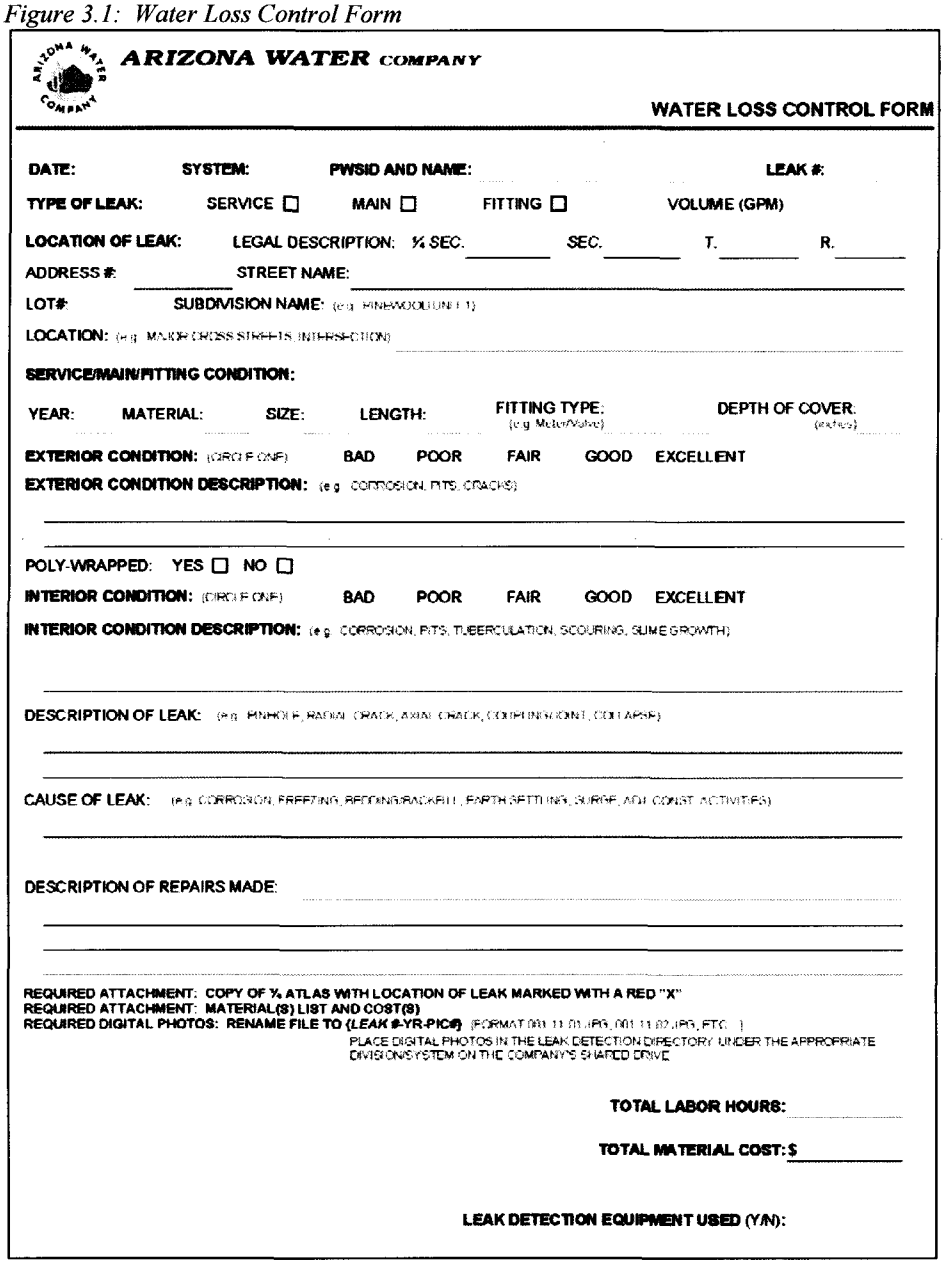
Leak Detection Equipment by Type	
Correlators:	8
Loggers:	4
Geophones/Acoustic Noise Amplifiers:	14

The Company's employees undergo extensive training in the proper operation, use and interpretation of results generated from each type of leak detection equipment. The use of this equipment is effective for locating water main and service line leaks and breaks, facilitating repairs, reducing the overall cost of repairs and helping to reduce water losses. In 2011, the Company purchased an additional leak detection logger and an acoustic noise amplifier for use by its employees in its Pinewood and Rimrock water systems, increasing the availability of such equipment. When the Company's employees need to share leak detection equipment with the rest of the Verde Valley Division, locating and making repairs may be unavoidably delayed.

3.1.2 Documentation of Leak Data

To assist in the systematic collection and tracking of water leak data, the Company also documents water leaks through the use of a Water Loss Control form, (*See* Figure 3.1). This data tracking form is completed each time a leak or break is discovered and repaired, providing a detailed accounting of the leak or break and its repair, including the location, pipe condition, cause of leak or break, labor-hours expended and other related costs. The information entered on this form is used to identify high frequency leak or break areas where additional leak detection efforts are prioritized. This information also helps to determine the timing and priority of water main and service line replacements as well as the preparation of infrastructure replacement budgets. Since 2010, over 1,000 Water Loss Control forms have been completed by Company employees.

Figure 3.1: Water Loss Control Form



ARIZONA WATER COMPANY

WATER LOSS CONTROL FORM

DATE: **SYSTEM:** **PWSID AND NAME:** **LEAK #:**

TYPE OF LEAK: SERVICE ☐ MAIN ☐ FITTING ☐ VOLUME (GPM)

LOCATION OF LEAK: LEGAL DESCRIPTION: ¼ SEC. _____ SEC. _____ T. _____ R. _____

ADDRESS #: _____ **STREET NAME:** _____

LOT#: **SUBDIVISION NAME:** (e.g. PINEWOOD UNIT 1)

LOCATION: (e.g. MAJOR CROSS STREETS, INTERSECTION)

SERVICE/MAIN/FITTING CONDITION:

YEAR: **MATERIAL:** **SIZE:** **LENGTH:** **FITTING TYPE:** (e.g. Meter/Valve) **DEPTH OF COVER:** (inches)

EXTERIOR CONDITION: (CIRCLE ONE) BAD POOR FAIR GOOD EXCELLENT

EXTERIOR CONDITION DESCRIPTION: (e.g. CORROSION, PITS, CRACKS)

_____

_____

POLY-WRAPPED: YES ☐ NO ☐

INTERIOR CONDITION: (CIRCLE ONE) BAD POOR FAIR GOOD EXCELLENT

INTERIOR CONDITION DESCRIPTION: (e.g. CORROSION, PITS, TUBERCULATION, SCOURING, SLIME GROWTH)

_____

DESCRIPTION OF LEAK: (e.g. PINHOLE, RADIAL CRACK, AXIAL CRACK, COUPLING JOINT, COLLAPSE)

_____

_____

CAUSE OF LEAK: (e.g. CORROSION, FREEZING, BEDDING/BACKFILL, EARTH SETTLING, SURGE, ADJ. CONST. ACTIVITIES)

_____

DESCRIPTION OF REPAIRS MADE:

_____

_____

_____

REQUIRED ATTACHMENT: COPY OF ¼ ATLAS WITH LOCATION OF LEAK MARKED WITH A RED "X"
REQUIRED ATTACHMENT: MATERIAL(S) LIST AND COST(S)
REQUIRED DIGITAL PHOTOS: RENAME FILE TO *(LEAK #-YR-PIC#)* (FORMAT 093-11-01.JPG, 093-11-02.JPG, ETC.)
PLACE DIGITAL PHOTOS IN THE LEAK DETECTION DIRECTORY UNDER THE APPROPRIATE DIVISION/SYSTEM ON THE COMPANY'S SHARED DRIVE

TOTAL LABOR HOURS: _____

TOTAL MATERIAL COST: $ _____

LEAK DETECTION EQUIPMENT USED (Y/N): _____

3.2 Leak Repair

Detecting and locating leaks and breaks are necessary steps prior to initiating repairs. The Company reduces water losses through timely maintenance and repair of leaks and breaks. The Company schedules repairs of smaller water main and service line leaks as soon as possible, while water main breaks are repaired on an expedited or emergency basis. Water main leaks are generally much more difficult to locate than water main breaks as the rates of leakage are typically much less and not easily located, except through more advanced methods of detection, such as through the use of listening devices, leak detection equipment and/or by conducting leak surveys. For the first nine months of 2011, nearly 500 leaks and breaks were

located and repaired in the seven water systems that are the subject of this report, as shown in Table 3.2.

Table 3.2: Company Leaks and Breaks – 2011

Leaks and Breaks by Type and Water System Jan-Sept 2011		
Water System	**Water Mains**	**Service Lines**
Coolidge Airport	1	2
Pinetop Lakes	3	1
Overgaard	4	48
Miami	106	98
Rimrock	32	20
Bisbee	106	31
Pinewood	29	11
Total	**281**	**211**

3.3 Meter Maintenance Program

The Company has established the criteria for meter repairs and/or replacement as part of its meter maintenance program. The Company does not repair or replace water meters based solely on years in service, but also considers gallonage and water quality as additional repair/replacement factors, thus effectively and efficiently using resources. The Company's meter shop, through its many years of experience both testing and repairing water meters, has established comprehensive meter maintenance criteria based on meter size, meter type, gallonage, length of time in service and water quality (*See* Appendix 12.1). Water quality varies between systems and can even vary within a system. These variances can affect meter accuracy and the useful life of a water meter. For example, sand and other fine materials can cause abrasive wear on meters and build up or deposits from hard water can increase friction on moving parts, causing a meter to "run slow" and increasing water losses.

The Company's meter shop also performs approximately 1,000 random annual meter tests to provide an ongoing assessment which helps to establish the most appropriate meter maintenance criteria for each system. In this way, the Company ensures that meter accuracy is cost-effectively maintained for each water system, verified through random meter testing, while still keeping water losses due to meter inaccuracies low. The Company's meter maintenance and testing programs benefit all of the Company's water systems. For the 12 months ending September 2011, nearly 1,000 meters were either repaired or replaced in these seven water systems, as detailed in Table 3.3.

Table 3.3: Meter Change-Out by System/Year

Meter Change Out by System and Year			
Water System	**2009**	**2010**	**2011**
Coolidge Airport	7	--	--
Pinetop Lakes	37	45	63
Overgaard	47	259	329
Miami	196	294	171
Rimrock	91	46	20
Bisbee	232	119	290
Pinewood	167	21	123
Total	**777**	**784**	**996**

3.4 Meter Selection Review

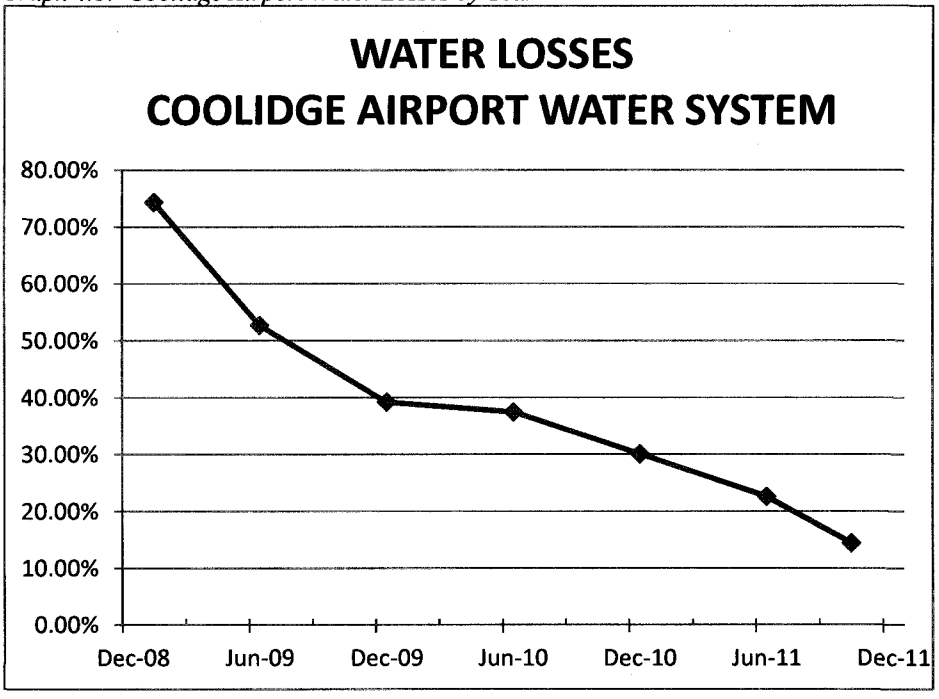
Following guidelines provided by the Company's meter shop, the Company's engineering department reviews new meter applications prior to establishing water service. Typically, 5/8 x 3/4-inch water meters are installed for residential customers in new subdivisions. Residential and non-residential meter applications that require one-inch or larger water meters can result in a wide range of flows, with the largest meter applications typically including fire flows. As a result, the Company's engineering department determines the most appropriate size and type of meter for each specific meter application to meet the service needs and accurately measure all water provided throughout the anticipated range of flows. Again, water losses are minimized when the correct meter is chosen for the particular application.

4.0 COOLIDGE AIRPORT WATER SYSTEM

4.1 Overview of Water System

The Coolidge Airport water system, located approximately 10 miles southeast of the City of Coolidge has been operated and maintained by the Company since February 2008. As shown in Graph 4.1 below, water losses were greater than 70 percent at the beginning of the Company's operation of this water system. Initially, the Coolidge Airport water distribution system was constructed primarily of cement asbestos and PVC pipe and service lines were constructed primarily of PVC materials. The Company replaced a significant portion of the oldest mains and new water mains are constructed of C-900 PVC pipe. Seven of nine service line connections have been replaced and all service lines are now constructed from copper materials. Graph 4.1 also shows the benefits that can be achieved when aging and failing water mains and service lines are replaced.

Graph 4.1: Coolidge Airport Water Losses by Year



4.2 Causes of Water Losses

The Company discovered several unmetered services and inaccurate meters which contributed to water losses. The Company's employees installed water meters for the unmetered services and replaced the existing water meters with new water meters. Additionally, the Company's employees located and repaired three water main breaks and three service line leaks since 2008.

4.3 Additional Steps Taken to Reduce Water Losses

1. The Company replaced approximately 3,400 LF of aging and failing PVC water mains where the largest source of breaks and leaks occurred.

2. The Company replaced seven of nine water services that were in poor condition and a likely cause of water losses.

3. The Company constructed a replacement booster pump station, an automatic control system and a 15,000-gallon water storage tank to provide more stable water pressure and reduce the frequency of water leaks and breaks potentially caused by fluctuating water pressure.

4.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 4.3 will cause water losses to drop from 15 percent to less than 10 percent. This reduction in water losses would not have been possible without the replacement of a significant portion of water mains, service lines and meters. The approximate cost to replace this infrastructure was $141,000.

4.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage Coolidge Airport water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not drop below 10 percent or if losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $215,000 in 2012 for its Pinal Valley Division, which includes the Company's Coolidge Airport water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

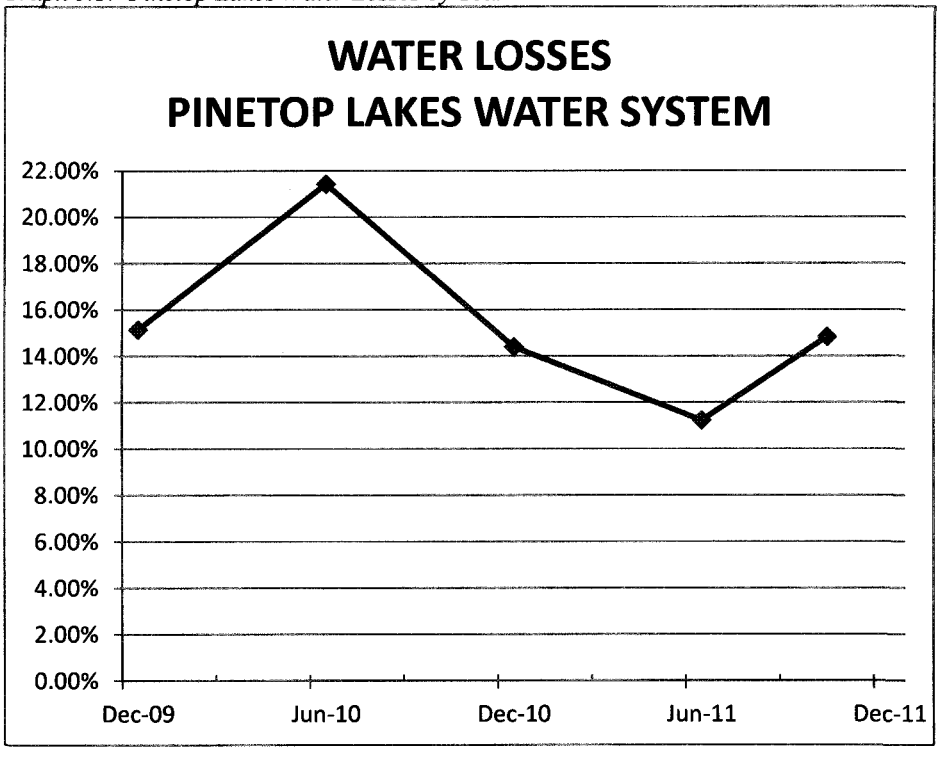
4. If in the future the Company's assessment of the Coolidge Airport water system shows that additional water distribution system infrastructure needs to be replaced, the Company will include such replacement infrastructure in the Company's infrastructure replacement plan, subject to budget constraints.

5.0 PINETOP LAKES WATER SYSTEM

5.1 Overview of Water System

The Pinetop Lakes water system, located in the Pinetop-Lakeside area in Arizona, is one of the water systems in the Company's Navajo Division. As shown in Graph 5.1 below, water losses have exceeded 10 percent since 2009. There are over 84,000 LF (16 miles) of water mains in service varying in size and material, including cement asbestos, ductile iron and PVC materials. There are approximately 1,000 water service lines in service constructed primarily of polybutylene, polyethylene and copper materials.

Graph 5.1: Pinetop Lakes Water Losses by Year



5.2 Causes of Water Losses

Water losses in the Pinetop Lakes water system are caused by a combination of water main and service line leaks and breaks. In the past two years, five large non-surfacing leaks and breaks caused by failing water distribution infrastructure were located and repaired using electronic leak detection equipment in the Pinetop Lakes water system. These leaks and breaks are estimated to have accounted for over 900,000 gallons of water losses per month.

5.3 Additional Steps Taken to Reduce Water Losses

1. As part of the Company's plan to reduce water losses, the Company measured and mapped the entire Pinetop Lakes water system to help expedite future surveys using digital leak detection loggers.

2. The Company increased the number of system-wide leak surveys by 50 percent, from two per year to three per year in its Pinetop Lakes water system using digital leak detection loggers.

5.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 5.3 will reduce water losses for its Pinetop Lakes water system, but additional steps may be necessary to reduce water losses to less than 10 percent.

5.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage Pinetop Lakes water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not drop below 10 percent or if losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $64,000 for 2012 for its Navajo Division, which includes the Company's Pinetop Lakes water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

5.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Pinetop Lakes water system and determined that in order to reduce water losses to below 10 percent nearly 9,000 feet of aging water mains and 800 failing polybutylene and polyethylene water service lines need to be replaced. The preliminary cost estimate to replace these facilities is nearly $4.2 million as shown in the table on page 62 of Appendix 12.3.1.

If these replacements are made water losses should drop to 10 percent or below. Table 5.6.1, Column B, Lines 16 – 18 shows that at a current water loss rate of 11.2 percent the amount of water lost annually is 7,061.8 thousand gallons. Reducing water losses to 10 percent would result in 6,292.9 thousand gallons lost annually or a savings of 768.9 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 5.6.1, Column B, Lines 2 – 6. When the total cost of production $61,618 is divided by the number of thousand gallons produced 62,929, the cost per thousand gallons produced of $0.98 results.

To determine the annual potential savings from reducing water losses to 10 percent, the cost per thousand gallons produced is multiplied by the reduction in lost water or 768.9 thousand gallons resulting in a potential annual savings of $753.

Table 5.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $4.2 million to replace nearly 9,000 feet of water mains and 800 services, which is the cost of reducing water losses in the Pinetop Lakes water system to 10 percent or below. The resulting annual revenue requirement would be $614,000. When compared to the amount of annual potential savings the annual revenue requirement for replacing this infrastructure would be greater by $613,000, meaning that rates would increase by over $600,000 or over 15 percent in order to save 769 thousand gallons of water. Since Overgaard

and Pinetop Lakes are in the same consolidated rate system reducing water loss to 10 percent or below for both water systems would result in an increase in rates of over 61 percent.

When evaluated over the life of the replacement assets (Table 5.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4 percent would be $131,072 compared to a revenue requirement of $19,240,000 or a net cost of $19.1 million.

Based on the analysis above and on Tables 5.6.1 and Appendix 12.2.1 page 52 the cost of reducing water losses in the Pinetop Lakes system to 10 percent or below far exceeds the potential benefits.

5.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent – Pinetop Lakes

Pinetop Lakes Water System

Line No.	(A)	(B)	(C)	(D)
1.	**Production Costs**		**Infrastructure Replacement Cost**	
2.	Supply Costs	$ 5,658	Required Investment to Lower Water Loss to 10%	$ 4,200,000
3.	Pumping Costs	45,546	Required Rate of Return	7.87%
4.	Treatment Costs	10,414	Required Operating Income	$ 330,540
5.			Tax Multiplier	1.6286
6.	TOTAL	$ 61,618	Revenue Requirement - Return on Investment	$ 538,317
7.				
8.	Production (MGALS)	62,929.0	Depreciation Expense at 1.79%	75,180
9.				
10.	Pumping Cost per MGAL	$ 0.98	Total Revenue Requirement	$ 613,497
11.				
12.				
13.				
14.				
15.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
16.	Production (MGALS)	62,929.0	Water Loss Reduction (MGAL) (Column B, line 22)	768.9
17.	Current Water Loss Percent	11.2%	Cost per MGAL (Column B, line 10)	$ 0.98
18.	Amount of Water Loss (MGAL)	7,061.8	Annual Potential Savings	$ 752.88
19.				
20.	Water Loss at 10% (MGAL)	6,292.9	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 613,497
21.				
22.	Water Loss Reduction (MGAL)	768.9	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (612,745)
23.				
24.				
25.				
26.	Savings over life of investment (Table 12.2.1, Column M, line 59)			$ 131,072
27.				
28.	Revenue requirement over life of investment (Table 12.2.1, column J, line 59)			19,236,712
29.				
30.	Net Benefit / (Cost) over life of investment			$ (19,105,640)

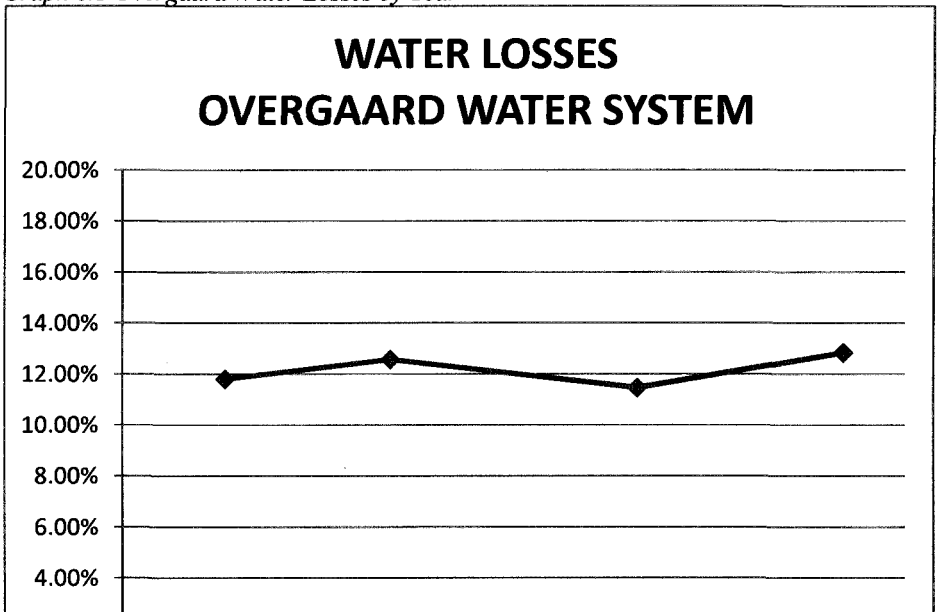
Please See Appendix 12.3.1 on page 62 for detailed costs of Pinetop Lakes Infrastructure Improvements

6.0 OVERGAARD WATER SYSTEM

6.1 Overview of Water System

The Overgaard water system, located in the Heber-Overgaard area in Arizona, is another water system in the Company's Navajo Division. As shown in Graph 6.1 below, water losses have exceeded 10 percent since August 2010. There are over 500,000 LF (97 miles) of water mains in service varying in size and material, including cement asbestos, ductile iron, PVC, steel and galvanized steel materials. There are approximately 4,200 water service lines in service constructed primarily of polybutylene, polyethylene and copper materials.

Graph 6.1 Overgaard Water Losses by Year



6.2 Causes of Water Losses

A common cause of water losses in the Overgaard water system is frozen water meters caused by cold winter weather, damaging the water meters and causing leaks. Service line leaks and breaks are another common cause of water losses for the Overgaard water system. Since 2007, over 280 leaks and breaks have been located and repaired in the Overgaard water system. 263 of these leaks and breaks were identified as either frozen water meters or service line leaks or breaks, as shown in Table 6.1 below.

Table 6.1: Overgaard Leaks by Type/Year

Water Leaks by Type and Year - Overgaard Water System			
Year	**Main Leaks**	**Service Leaks**	
		Meter	**Service Line**
2007	1	60	4
2008	5	4	73
2009	5	14	16
2010	3	23	21
2011	4	15	33
Total	**18**	**263**	

6.3 Additional Steps Taken to Reduce Water Losses

1. The Company identified the areas where freeze-damaged water meters are most common and has taken steps to reduce the risks of freezing by insulating meters by placing materials such as foam, sawdust or fiberglass within the meter boxes.

2. The Company increased the use of leak detection loggers by 50 percent, from two days per week to three days per week.

3. The Company purchased 20 anti-theft locks for fire hydrants located in the remote areas of the Overgaard water system to reduce the risk of unauthorized water use and potentially reduce water losses caused by theft.

4. The Company's employees have conducted a system-wide leak survey of its Overgaard water system using leak detection equipment described in Section 3 of this report. Although several small leaks were located and repaired, no areas were identified that would account for any significant percentage of water losses that currently exist for this water system.

6.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 6.3 will help to reduce water losses for its Overgaard water system, but additional steps may be necessary in the future to reduce water losses to less than 10 percent.

6.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage the Overgaard water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not drop below 10 percent or if losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $64,000 for 2012 for its Navajo Division, which includes the Company's Overgaard water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects. The Company also

plans to purchase 10 additional anti-theft locks for fire hydrants for its Overgaard water system in 2012.

4. The Company budgeted $50,000 for 2012 to construct additional freeze protection for 75 water meters and related meter box assemblies for its Overgaard water system.

5. The Company budgeted $40,000 for 2012 to replace a failing automatic control system for its Zane Grey pump station. This project will reduce automatic control failures that have been one of the causes of water losses for the Overgaard water system.

6. The Company budgeted $25,000 for 2012 for its Navajo Division, which includes the Overgaard water system, to purchase additional leak detection equipment.

6.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Overgaard water system and determined that in order to reduce water losses to below 10 percent, over 18,000 feet of aging water mains and 2,100 failing polybutylene and polyethylene water service lines need to be replaced. Additionally, 4,200 meter boxes need to be retrofitted with insulating materials to provide better freeze protection. The preliminary cost estimate to replace these facilities is nearly $12.5 million as shown in the table on page 63 of Appendix 12.3.2.

If these replacements are made water losses should drop to 10 percent or below. Table 6.6.1, Column B, Lines 16 – 18 shows that at a current water loss rate of 11.5 percent the amount of water lost annually is 17,060.4 thousand gallons. Reducing water losses to 10 percent would result in 14,885.5 thousand gallons lost annually or a savings of 2,174.9 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 6.6.1, Column B, Lines 2 – 6. When the total cost of production $140,841 is divided by the number of thousand gallons produced 148,855, the cost per thousand gallons produced of $0.95 results.

To determine the annual potential savings from reducing water losses to 10 percent the cost per thousand gallons produced is multiplied by the reduction in lost water or 2,174.9 thousand gallons resulting in a potential annual savings of $2,058 (Table 6.6.1, Column D, Line 17).

Table 6.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $12.5 million to replace 18,000 feet of water mains and 2,100 service lines and retrofitting 4,200 meter boxes to provide better freeze protection, which is the cost of reducing water losses in the Overgaard system to 10 percent or below. The resulting annual revenue requirement would be $1,826,000. When compared to the amount of annual potential savings the revenue requirement for replacing this infrastructure would be greater by $1,824,000, meaning that rates would increase by over $1.8 million or nearly 46 percent in order to save 2,175 thousand gallons of water. Since Overgaard and Pinetop Lakes are in the same consolidated rate system reducing water loss to 10 percent or below for both these systems would result in an increase in rates of over 61 percent.

When evaluated over the life of the replacement assets (Table 6.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4 percent would be $358,257 compared to a revenue requirement of $57 million or a net cost of $56.9 million.

Based on the analysis above and on Tables 6.6.1 and Appendix 12.2.2 page 53 the cost of reducing water losses in the Overgaard system to 10 percent or below far exceeds the potential benefits.

6.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent - Overgaard

Overgaard Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 12,932	Required Investment to Lower Water Loss to 10%	$ 12,500,000
2.	Pumping Costs	104,105	Required Rate of Return	7.87%
3.	Treatment Costs	23,804	Required Operating Income	$ 983,750
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 140,841	Revenue Requirement - Return on Investment	$ 1,602,135
6.				
7.	Production (MGALS)	148,855.0	Depreciation Expense at 1.79%	223,750
8.				
9.	Pumping Cost per MGAL	$ 0.95	Total Revenue Requirement	$ 1,825,885
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	148,855.0	Water Loss Reduction (MGAL) (Column B, line 22)	2,174.9
16.	Current Water Loss Percent	11.5%	Cost per MGAL (Column B, line 10)	$ 0.95
17.	Amount of Water Loss (MGAL)	17,060.4	Annual Potential Savings	$ 2,057.81
18.				
19.	Water Loss at 10% (MGAL)	14,885.5	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 1,825,885
20.				
21.	Water Loss Reduction (MGAL)	2,174.9	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (1,823,827)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.2, Column M, line 59)			$ 358,257
26.				
27.	Revenue requirement over life of investment (Table 12.2.2, column J, line 59)			57,252,124
28.				
29.	Net Benefit / (Cost) over life of investment			$ (56,893,867)

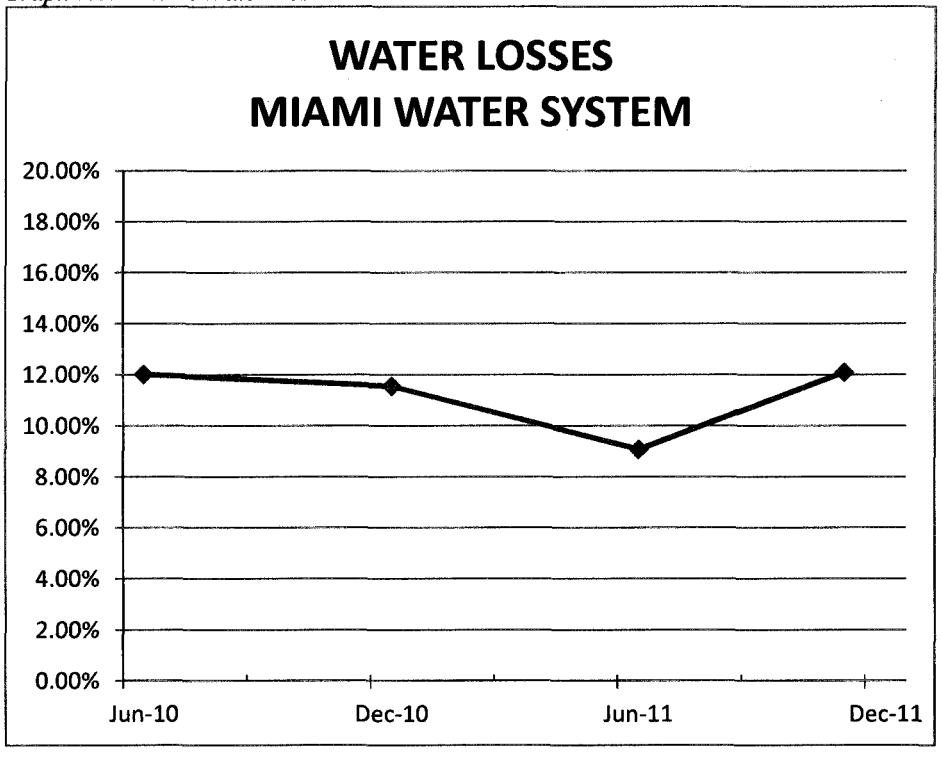
Please see Appendix 12.3.2 on page 63 for detailed costs of Overgaard Infrastructure Improvements

7.0 MIAMI WATER SYSTEM

7.1 Overview of Water System

The Miami water system, located in Gila County, Arizona is one of three Superstition Division water systems. As shown in Graph 7.1 below, water losses exceeded 10 percent from June 2010 until June 2011 when water losses dropped below 10 percent, however water losses increased above 10 percent again in July of 2011. There are over 380,000 LF (72 miles) of water mains in service varying in size and materials, including cement asbestos, cast iron, ductile iron, copper, steel, galvanized steel and PVC materials. There are approximately 3,000 water service lines in service constructed primarily of galvanized steel, polybutylene and polyethylene materials.

Graph 7.1: Miami Water Losses



7.2 Causes of Water Losses

1. Service leaks and breaks make up over two-thirds of all leaks and breaks within the Miami water system and are a significant cause of water losses. The majority of these leaks and breaks are caused by aging infrastructure and are commonly observed where polybutylene, polyethylene and galvanized steel service lines are in use.

2. Unplanned tank overflows, caused by automatic control signal failures at the Bandy Heights water storage tank are another cause of water losses.

3. Locations where failing water mains have been identified:

a. Approximately 1,300 LF section of galvanized steel water main in an area near Bloody Tanks Wash.

b. Approximately 1,645 LF of cement asbestos water main along Live Oak Street, which was installed in 1953.

c. Galvanized steel water mains in the downtown area of Miami and in the Central Heights area installed between the 1930s and the 1950s.

Numerous leaks in the past few years were located and repaired in these three areas. Nine leaks in the past six years were located and repaired along Live Oak Street alone. Of the nearly 800 leaks and breaks located and repaired in the Miami water system during the past five years, as shown in Table 7.1 below, more than half were observed in the three areas described above.

Table 7.1: Miami Leaks by Type/Year

WATER LEAKS BY TYPE AND YEAR - MIAMI WATER SYSTEM		
Year	**Main Leaks**	**Service Leaks**
2007	23	42
2008	30	100
2009	36	131
2010	73	155
2011	106	98
Total	**268**	**526**

7.3 Additional Steps Taken to Reduce Water Losses

1. The Company replaced approximately 1,645 LF of failing cement asbestos water main on Live Oak Street with new ductile iron pipe.

2. The Company replaced approximately 1,400 LF of failing eight-inch cement asbestos water main with new eight-inch ductile iron pipe along U.S. 60 from Cordova to Reppy Avenue.

3. The Company replaced failing radio controls at the Bandy Heights water storage tank to eliminate or reduce unplanned tank overflows caused by automatic control signal failures.

4. The Company's employees conducted leak surveys of its Miami water system using digital leak detection loggers on the galvanized steel water mains in the Bloody Tanks Wash, downtown Miami and Central Heights areas.

7.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 7.3 will help to reduce water losses for its Miami water system, but additional steps may be necessary in the future to reduce water losses to less than 10 percent.

7.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage Miami water system water losses by tracking ongoing water losses each month and follow up with corrective actions to mitigate any upward trends in water losses.

2. If water losses do not drop below 10 percent or if water losses trend back upwards, the Company will direct its employees to increase use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $307,500 for 2012 for its Superstition Division, which includes the Company's Miami water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

4. The Company budgeted $50,000 for 2012 for its Miami water system to replace 400 LF of six-inch of failing steel water main in Bloody Tanks Wash with new six-inch ductile iron pipe.

5. The Company's employees will continue to perform leak surveys in the downtown Miami and Central Heights areas where galvanized steel water mains installed from the 1930s through the 1950s have shown signs of failure and where leaks and breaks have been observed.

7.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Miami water system and determined that in order to reduce water losses to below 10 percent, over 113,000 feet of aging water mains and 2,000 failing service lines need to be replaced. The preliminary cost estimate to replace this aging infrastructure is over $18.3 million as shown in the table on page 64 of Appendix 12.3.3.

If these replacements are made water losses should drop to 10 percent or below. Table 7.6.1, Column B, Lines 16 – 18 show that at a current water loss rate of 12.1 percent the amount of water lost annually is 39,756.9 thousand gallons. Reducing water losses to 10 percent would result in 32,899.7 thousand gallons lost annually or a savings of 6,857.2 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 7.6.1, Column B, Lines 2 – 6. When the total annual cost of production $307,697 is divided by the number of thousand gallons produced annually 328, 997.2, the cost per thousand gallons produced of $0.94 results.

To determine the annual potential savings from reducing water losses to 10 percent, the cost per thousand gallons produced is multiplied by the reduction in lost water or 6,857.2 thousand gallons resulting in a potential annual savings of $6,413.

Table 7.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $18.3 million to replace over 113,000 feet of water mains and 2,100 services, which is the cost of reducing water losses in the Miami system to 10 percent or below. The resulting annual revenue requirement would be $2.7 million. When compared to the amount of annual potential savings the revenue requirement for replacing this infrastructure would be greater by $2.667 million, meaning that rates would increase by nearly $2.7 million or 16 percent in order to save 6,857 thousand gallons of water.

When evaluated over the life of the replacement assets (Table 7.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4 percent would be $1.1 million compared to a revenue requirement of $83.8 million or a net cost of $82.7 million.

Based on the analysis above and on Tables 7.6.1 and Appendix 12.2.3 page 54 the cost of reducing water loss in the Miami system to 10 percent or below far exceeds the potential benefits.

7.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent - Miami

Miami Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 76,015	Required Investment to Lower Water Loss to 10%	$ 18,300,000
2.	Pumping Costs	191,318	Required Rate of Return	7.87%
3.	Treatment Costs	40,364	Required Operating Income	$ 1,440,210
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 307,697	Revenue Requirement - Return on Investment	$ 2,345,526
6.				
7.	Production (MGALS)	328,997.2	Depreciation Expense at 1.79%	327,570
8.				
9.	Pumping Cost per MGAL	$ 0.94	Total Revenue Requirement	$ 2,673,096
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	328,997.2	Water Loss Reduction (MGAL) (Column B, line 22)	6,857.2
16.	Current Water Loss Percent	12.1%	Cost per MGAL (Column B, line 10)	$ 0.94
17.	Amount of Water Loss (MGAL)	39,756.9	Annual Potential Savings	$ 6,413.23
18.				
19.	Water Loss at 10% (MGAL)	32,899.7	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 2,673,096
20.				
21.	Water Loss Reduction (MGAL)	6,857.2	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (2,666,683)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.3, Column M, line 59)			$ 1,116,524
26.				
27.	Revenue requirement over life of investment (Table 12.2.3, column J, line 59)			83,817,107
28.				
29.	Net Benefit / (Cost) over life of investment			$ (82,700,583)

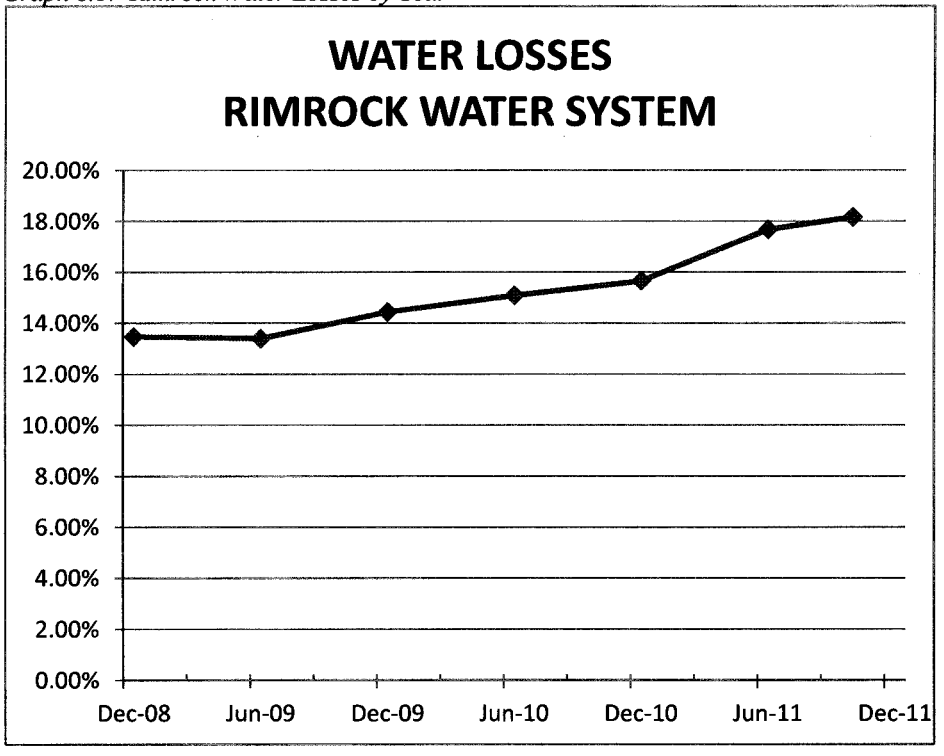
Please See Appendix 12.3.3 on page 64 for detailed costs for Miami Infrastructure Improvements

8.0 RIMROCK WATER SYSTEM

8.1 Overview of Water System

The Rimrock water system is one of four Verde Valley Division water systems. As shown in Graph 8.1 below, water losses have exceeded 10 percent for the last four years and have increased above 15 percent over the past 18 months. There are over 165,000 LF (31 miles) of water mains in service varying in size, material and age, including cement asbestos, cast iron, copper, ductile iron, galvanized steel, PVC and steel materials. There are 1,225 water service lines in service which are constructed from copper, galvanized steel, polybutylene and polyethylene materials.

Graph 8.1: Rimrock Water Losses by Year



8.2 Causes of Water Losses

Galvanized steel and cement-asbestos water mains installed in the 1960s were the predominant materials used for water mains, representing over 75 percent of all water mains currently in service in the Rimrock water system. Most of these water mains are at or near the end of their useful service lives. The Company's repair history shows that nearly two-thirds of all leak repairs and replacements were on water mains alone. As shown in Table 8.1 below, the number of water main leaks has increased from three leaks in 2007 to 32 leaks for the first nine months of 2011. The number of service leaks has also increased over this same time period.

Table 8.1: Rimrock Leaks by Type/Year

Water Leaks by Type and Year - Rimrock Water System		
Year	**Main Leaks**	**Service Leaks**
2007	3	5
2008	0	0
2009	15	8
2010	41	19
2011	32	20
Total	**91**	**52**

The Company has determined that approximately 32,000 LF of water main will be at or near the end of its useful life within the next 10 years. Using information gathered from the Water Loss Control forms plotted on a map of the Rimrock water system, the Company has identified seven geographic areas in the Rimrock water system where water mains are at or beyond their useful service lives and need to be replaced.

8.3 Additional Steps Taken to Reduce Water Losses

1. The Company replaced a failing galvanized steel water main on Paiute Trail with 275 LF of ductile iron pipe, one of the seven geographic areas identified from information gathered from the Water Loss Control forms.

2. The Company increased the amount of time spent performing leak detection surveys of the Rimrock water system with digital leak detection loggers from one day per week to two days per week.

8.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 8.3 will help to reduce water losses, however, additional steps will be necessary in the future to further reduce water losses to below 15 percent. Reducing water losses to below 10 percent will require the Company to increase infrastructure replacement through development of a long-term infrastructure replacement plan.

Even with the recent completion of a water main replacement project at a cost of $40,000, the Company does not project that water losses will drop below 10 percent or 15 percent. Failing infrastructure is the primary cause for water losses in the Rimrock water system. If the Company is able to increase the rate of infrastructure replacement the Company should be able to reduce water losses below 10 percent.

8.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage the Rimrock water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not drop below 10 percent or if water losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $97,000 for 2012 for its Verde Valley Division, which includes the Company's Rimrock water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

4. The Company budgeted $75,000 for 2012 to replace failing galvanized steel pipe with 750 LF of six-inch ductile iron pipe and replace 23 water services on Cliffside Trail for its Rimrock water system.

5. The Company budgeted $50,000 for 2012 to replace failing galvanized steel pipe with 800 LF of six-inch ductile iron pipe and replace six water services on Antigua Way for its Rimrock water system.

8.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Rimrock water system and determined that in order to reduce water losses to below 10 percent, over 40,000 feet of aging water mains and 940 failing polybutylene and polyethylene water service lines need to be replaced. The preliminary cost estimate to replace this aging infrastructure is nearly $7.8 million as shown in the table on page 65 of Appendix 12.3.4.

If these replacements are made water losses should drop to 10 percent or below. Table 8.6.1, Column B, Lines 16 – 18 shows that at a current water loss rate of 17.7 percent the amount of water lost annually is 17,359.1 thousand gallons. Reducing water losses to 10 percent would result in 9,824.2 thousand gallons lost annually or a savings of 7,534.9 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 8.6.1, Column B, Lines 2 – 6. When the total annual cost of production $187,359 is divided by the number of thousand gallons produced annually 98,242, the cost per thousand gallons produced of $1.91 results.

To determine the annual potential savings from reducing water losses to 10 percent, the cost per thousand gallons produced is multiplied by the reduction in lost water or 7,535 thousand gallons resulting in a potential annual savings of $14,370.

Table 8.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $7.8 million to replace 40,000 feet of water mains and 940 services which is the cost of reducing water losses in the Rimrock system to 10 percent or below. The resulting annual revenue requirement would be $1.14 million. When compared to the amount of annual potential savings the revenue requirement for replacing this infrastructure would be greater by $1,125,000, meaning that rates would increase for the consolidated Verde Valley system (Sedona, Valley Vista, Rimrock and Pinewood) by over $1.1 million or over 8 percent in order to save 7,535 thousand gallons of water. Since Rimrock and Pinewood are in the same consolidated rate system reducing water losses to 10 percent or below for both these systems would result in an increase in rates of over 27 percent.

When evaluated over the life of the replacement assets (Table 8.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4

percent would be $2.5 million compared to a revenue requirement of $35.7 million or a net cost of $33.2 million.

Based on the analysis above and on Tables 8.6.1 and Appendix 12.2.4 page 55 the cost of reducing water losses in the Rimrock system to 10 percent or below far exceeds the potential benefits.

Because the Rimrock system is above 15 percent, the Company analyzed the potential savings and costs of reducing water loss to 15 percent or below. These results are presented in Table 8.6.2 and show that the potential annual savings would be $5,000 compared to a revenue requirement of $394,000 or a net increase in rates for the consolidated Verde Valley system (Sedona, Valley Vista, Rimrock and Pinewood) of $389,000. As with the analysis for reducing water losses to 10 percent the cost of reducing water losses in Rimrock to 15 percent or below far exceeds the potential benefits.

8.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent - Rimrock

Rimrock Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 2,733	Required Investment to Lower Water Loss to 10%	$ 7,800,000
2.	Pumping Costs	59,880	Required Rate of Return	7.87%
3.	Treatment Costs	124,746	Required Operating Income	$ 613,860
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 187,359	Revenue Requirement - Return on Investment	$ 999,732
6.				
7.	Production (MGALS)	98,242.0	Depreciation Expense at 1.79%	139,620
8.				
9.	Pumping Cost per MGAL	$ 1.91	Total Revenue Requirement	$ 1,139,352
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	98,242.0	Water Loss Reduction (MGAL) (Column B, line 22)	7,534.9
16.	Current Water Loss Percent	17.7%	Cost per MGAL (Column B, line 10)	$ 1.91
17.	Amount of Water Loss (MGAL)	17,359.1	Annual Potential Savings	$ 14,369.94
18.				
19.	Water Loss at 10% (MGAL)	9,824.2	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 1,139,352
20.				
21.	Water Loss Reduction (MGAL)	7,534.9	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (1,124,982)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.4, Column M, line 59)			$ 2,501,766
26.				
27.	Revenue requirement over life of investment (Table 12.2.4, column J, line 59)			35,725,326
28.				
29.	Net Benefit / (Cost) over life of investment			$ (33,223,560)

Please see Appendix 12.3.4 on page 65 for detailed costs for Rimrock Infrastructure Improvements

8.6.2 Cost Benefit Analysis of Reducing Water Losses to 15 Percent - Rimrock

Rimrock Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 2,733	Required Investment to Lower Water Loss to 15%	$ 2,700,000
2.	Pumping Costs	59,880	Required Rate of Return	7.87%
3.	Treatment Costs	124,746	Required Operating Income	$ 212,490
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 187,359	Revenue Requirement - Return on Investment	$ 346,061
6.				
7.	Production (MGALS)	98,242.0	Depreciation Expense at 1.79%	48,330
8.				
9.	Pumping Cost per MGAL	$ 1.91	Total Revenue Requirement	$ 394,391
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	98,242.0	Water Loss Reduction (MGAL) (Column B, line 22)	2,622.8
16.	Current Water Loss Percent	17.7%	Cost per MGAL (Column B, line 10)	$ 1.91
17.	Amount of Water Loss (MGAL)	17,359.1	Annual Potential Savings	$ 5,001.99
18.				
19.	Water Loss at 15% (MGAL)	14,736.3	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 394,391
20.				
21.	Water Loss Reduction (MGAL)	2,622.8	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (389,389)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.5, Column M, line 59)			$ 870,832
26.				
27.	Revenue requirement over life of investment (Table 12.2.5, column J, line 59)			12,366,464
28.				
29.	Net Benefit / (Cost) over life of investment			$ (11,495,632)
30.				

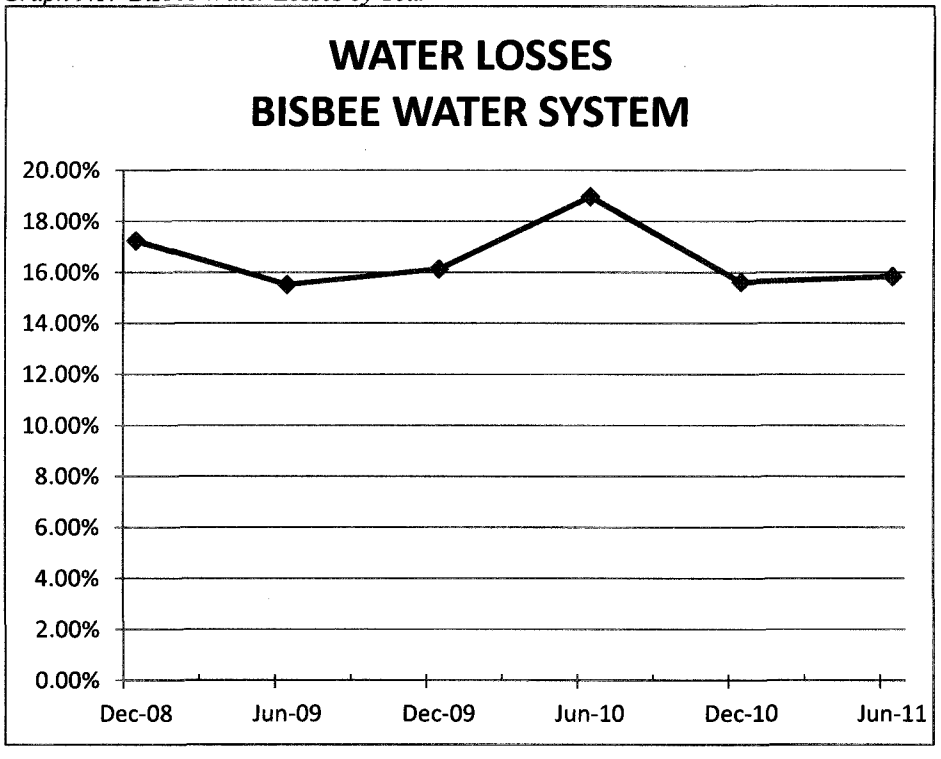
Please see Appendix 12.3.4 on page 65 for detailed costs for Rimrock Infrastructure Improvements

9.0 BISBEE WATER SYSTEM

9.1 Overview of Water System

The Bisbee water system is one of the oldest water systems in Arizona, dating back to the late 1800s, with the oldest water mains in service today dating back to 1901. The Bisbee water system is part of the Cochise Division, which also includes the Sierra Vista water system. As shown in Graph 9.1 below, water losses have exceeded 10 percent for the last 20 years, and have exceeded 15 percent for the past four years. There are nearly 380,000 LF (72 miles) of water mains in service varying in size, material and age, including cement asbestos, cast iron, copper, ductile iron, galvanized steel, PVC and steel materials. There are approximately 3,400 water service lines in service which are constructed from ductile iron, galvanized steel, polybutylene, polyethylene, steel and copper materials.

Graph 9.1: Bisbee Water Losses by Year



9.2 Causes of Water Losses

Steel and galvanized steel were the predominant materials used for water mains in the Bisbee water system from the early 1900s to the late 1960s. The oldest water mains are over 100 years old. Most of these water mains are either at, near or beyond the end of their useful service lives as shown by the fact that 80 percent of the leaks and breaks in the Bisbee water system are on steel and galvanized steel water mains. Additional analysis shows that approximately 180,000 LF, or nearly 50 percent of the water mains currently in service in the Bisbee water system need to be replaced.

As shown in Table 9.1 below, the number of leaks and breaks per year in the Bisbee water system has increased by more than one leak or break per week over the past four years, showing further signs of deterioration and an increasing need for replacement.

Table 9.1: Bisbee Leaks by Type/Year

Water Leaks by Type and Year - Bisbee Water System			
Year	**Main Leaks**	**Service Leaks**	**Number of Leaks/Week**
2007	83	11	1.9
2008	76	23	2.0
2009	147	43	3.8
2010	106	39	2.9
2011	106	31	3.3
Total	**518**	**147**	**- -**

9.3 Additional Steps Taken to Reduce Water Losses

1. The Company hired an additional employee in 2011 to provide additional resources to locate and repair leaks and breaks.

2. The Company replaced a failing steel water main and 45 services which were originally installed in 1908, with 1,960 LF of six-inch ductile iron pipe and 45 new copper services.

3. The Company replaced a failing steel water main and 17 services which were originally installed in 1908, with 1,140 LF of six-inch ductile iron pipe and 17 new copper services.

9.4 Assessment of Effect on Water Losses from Additional Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 9.3 will help to reduce water losses; however, additional steps may be necessary in the future to further reduce water losses to below 15 percent. Reducing water losses to less than 10 percent will require the Company to significantly increase the rate of infrastructure replacement through development of a long-term infrastructure replacement plan.

Even with the recent completion of water main and service line replacements at a cost of $442,000, the Company does not project that water losses will drop below 10 percent or even possibly 15 percent. Failing infrastructure is the primary cause of water losses in the Bisbee water system. If the Company is able to increase the rate of infrastructure replacement the Company should be able to reduce water losses to less than 15 percent and 10 percent.

9.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage the Bisbee water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not continue to drop or if water losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $136,000 for 2012 for its Cochise Division, which includes the Company's Bisbee water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

4. The Company budgeted $200,000 for 2012 to replace old failing waterlines in conjunction with City of Bisbee paving projects.

5. The Company budgeted $125,000 for 2012 to replace 340 LF of failing steel pipe on Church Street with new six-inch ductile iron pipe for its Bisbee water system.

6. The Company budgeted $100,000 for 2012 to replace 1,950 LF of failing galvanized steel mains on Bowers Street with new six-inch ductile iron pipe.

7. The Company budgeted $70,000 for 2012 to replace 700 LF of failing mains with new six-inch ductile iron pipe on Ocotillo Street.

8. The Company budgeted $15,000 for 2012 to replace a portion of a failing discharge pipe header at a booster station located at Tombstone Canyon.

9. The Company budgeted $30,000 for 2012 to replace 200 LF of failing 10-inch steel and 14-inch steel water mains at the Naco Warehouse Booster Station.

10. The Company budgeted $25,000 for 2012 for its Cochise Division which includes the Bisbee water system to purchase additional leak detection equipment.

9.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Bisbee water system and determined that in order to reduce water losses to below 10 percent, over 188,000 feet of aging water mains and over 1,700 failing polybutylene and polyethylene water service lines need to be replaced. The preliminary cost estimate to replace this aging infrastructure is over $23.5 million as shown in the table on page 66 of Appendix 12.3.5.

If these replacements are made water losses should drop to 10 percent or below. Table 9.6.1, Column B, Lines 16 – 18 show that at a current water loss rate of 15.8 percent the amount of water lost annually is 61,009.4 thousand gallons. Reducing water losses to 10 percent would result in 38,538.7 thousand gallons lost annually or a savings of 22,470.7 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 9.6.1, Column B, Lines 2 – 6. When the total annual cost of production $300,368 is divided by the number of thousand gallons produced annually 385,387, the cost per thousand gallons produced of $0.78 results.

To determine the annual potential savings from reducing water losses to 10 percent, the cost per thousand gallons produced is multiplied by the reduction in lost water or 22,470.7 thousand gallons resulting in a potential annual savings of $17,514.

Table 9.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $23.5 million to replace over 188,000 feet of water mains and over 1,700 services which is the cost of reducing water losses in the Bisbee system to 10

percent or below. The resulting annual revenue requirement would be $3.4 million. When compared to the amount of annual potential savings the revenue requirement for replacing this infrastructure would be greater by $3,415,000, meaning that rates would increase for the consolidated Cochise system (Bisbee and Sierra Vista) by over $3.4 million or over 101 percent in order to save 22,471 thousand gallons of water annually.

When evaluated over the life of the replacement assets (Table 9.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4 percent would be $3.1 million compared to a revenue requirement of $107.6 million or a net cost of $104.6 million.

Based on the analysis above and on Tables 9.6.1 and Appendix 12.2.6 page 57 the cost of reducing water losses in the Bisbee system to 10 percent or below far exceeds the potential benefits.

Because the Bisbee system is above 15 percent, the Company analyzed the potential savings and costs of reducing water loss to 15 percent or below. These results are presented in Table 9.6.2 and show that the potential annual savings would be $2,500 compared to a revenue requirement of $482,000 or a net increase in rates for the consolidated Cochise system (Bisbee and Sierra Vista) of $480,000. As with the analysis for reducing water losses to 10 percent the cost of reducing water losses in Bisbee to 15 percent or below exceeds the potential benefits.

9.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent - Bisbee

Bisbee Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 14,782	Required Investment to Lower Water Loss to 10%	$ 23,500,000
2.	Pumping Costs	245,362	Required Rate of Return	7.87%
3.	Treatment Costs	40,224	Required Operating Income	$ 1,849,450
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 300,368	Revenue Requirement - Return on Investment	$ 3,012,014
6.				
7.	Production (MGALS)	385,387.0	Depreciation Expense at 1.79%	420,650
8.				
9.	Pumping Cost per MGAL	$ 0.78	Total Revenue Requirement	$ 3,432,664
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	385,387.0	Water Loss Reduction (MGAL) (Column B, line 22)	22,470.7
16.	Current Water Loss Percent	15.8%	Cost per MGAL (Column B, line 10)	$ 0.78
17.	Amount of Water Loss (MGAL)	61,009.4	Annual Potential Savings	$ 17,513.51
18.				
19.	Water Loss at 10% (MGAL)	38,538.7	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 3,432,664
20.				
21.	Water Loss Reduction (MGAL)	22,470.7	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (3,415,151)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.6, Column M, line 59)			$ 3,049,056
26.				
27.	Revenue requirement over life of investment (Table 12.2.6, column J, line 59)			107,633,991
28.				
29.	Net Benefit / (Cost) over life of investment			$ (104,584,935)

Please see Appendix 12.3.5 on page 66 for detailed cost for Bisbee Infrastructure Improvements

9.6.2 Cost Benefit Analysis of Reducing Water Losses to 15 Percent - Bisbee

Bisbee Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 14,782	Required Investment to Lower Water Loss to 15%	$ 3,300,000
2.	Pumping Costs	245,362	Required Rate of Return	7.87%
3.	Treatment Costs	40,224	Required Operating Income	$ 259,710
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 300,368	Revenue Requirement - Return on Investment	$ 422,964
6.				
7.	Production (MGALS)	385,387.0	Depreciation Expense at 1.79%	59,070
8.				
9.	Pumping Cost per MGAL	$ 0.78	Total Revenue Requirement	$ 482,034
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	385,387.0	Water Loss Reduction (MGAL) (Column B, line 22)	3,201.4
16.	Current Water Loss Percent	15.8%	Cost per MGAL (Column B, line 10)	$ 0.78
17.	Amount of Water Loss (MGAL)	61,009.4	Annual Potential Savings	$ 2,495.11
18.				
19.	Water Loss at 15% (MGAL)	57,808.1	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 482,034
20.				
21.	Water Loss Reduction (MGAL)	3,201.4	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (479,539)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.7, *Column M, line 59*)			$ 434,390
26.				
27.	Revenue requirement over life of investment (Table 12.2.7, column J, line 59)			15,114,563
28.				
29.	Net Benefit / (Cost) over life of investment			$ (14,680,173)

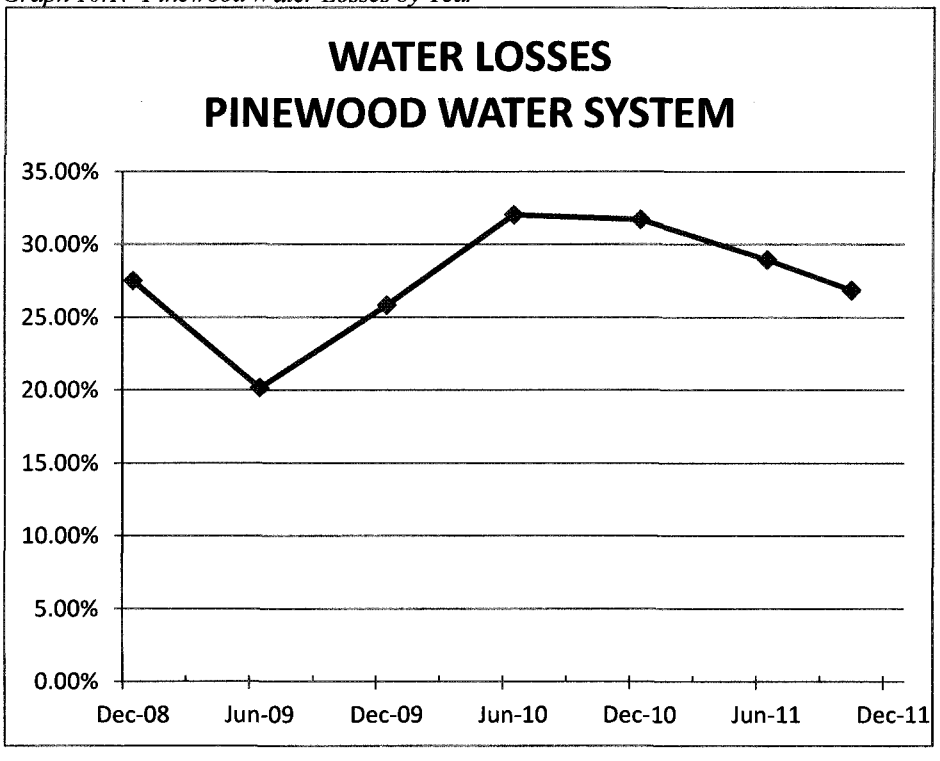
Please see Appendix 12.3.5 on page 66 for detailed cost for Bisbee Infrastructure Improvements

10.0 PINEWOOD WATER SYSTEM

10.1 Overview of Water System

The Pinewood water system serves the Munds Park area in Northern Arizona, and is one of four water systems in the Verde Valley Division. As shown in Graph 10.1 below, water losses have exceeded 10 percent for the last 10 years and have exceeded 15 percent for the past five years. There are over 167,000 LF (32 miles) of water mains in service varying in size, material and age, including cement asbestos, ductile iron and galvanized steel materials. There are approximately 2,900 water service lines in service which are constructed primarily from polybutylene and polyethylene materials although replacement service lines are constructed of copper materials.

Graph 10.1: Pinewood Water Losses by Year



10.2 Causes of Water Losses

Over 75 percent of the leaks requiring repair or replacement in the Pinewood water system were caused by failing polybutylene and polyethylene service lines. These types of service line materials were commonly used by the water industry from the 1960s to the 1980s.

Unfortunately, unlike copper service lines, polybutylene and polyethylene service lines suffer from environmental stress cracking, which cause service line failures. As a result, the service lines installed from the 1960s through the 1980s are failing at an increasing rate. Temporary repairs can be made to these types of services, but further degradation continues and eventually replacement is necessary. As shown in Table 10.1 below, since 2007, service line leaks and breaks have more than doubled for the Company's Pinewood water system.

Table 10.1: Pinewood Leaks by Type/Year

Water Leaks by Type and Year - Pinewood Water System		
Year	**Main Leaks**	**Service Leaks**
2007	8	13
2008	14	38
2009	14	31
2010	6	31
2011	11	29
Total	**53**	**142**

10.3 Additional Steps Taken to Reduce Water Losses

1. The Company increased leak detection efforts in its Pinewood water system through increased use of digital leak detection loggers from three days per week to four days per week.

2. The Company replaced 40 failing services in areas with the highest instances of service leaks.

10.4 Assessment of Effect on Water Losses from Steps Taken to Reduce Water Losses

The Company expects that the additional steps taken to reduce water losses identified in Section 10.3 will help to reduce water losses; however, additional steps will be necessary in the future to further reduce water losses below 15 percent. Reducing water losses to less than 10 percent will require the Company to significantly increase the rate of infrastructure replacement through development of a long-term infrastructure replacement plan.

Even with the recent completion of service line replacements at a cost of approximately $200,000, the Company does not project that water losses will drop below 10 percent or 15 percent. Failing infrastructure is the primary cause of water losses in the Pinewood water system. If the Company is able to increase the rate of infrastructure replacement, the Company should be able to reduce water losses to less than 15 percent and 10 percent.

10.5 Additional Steps to be Taken in the Future to Reduce Water Losses

1. Manage the Pinewood water system water losses by tracking ongoing water losses each month and follow up with corrective actions to help mitigate any upward trends in water losses.

2. If water losses do not continue to drop or if water losses trend back upwards, the Company will direct its employees to increase the use of digital leak detection loggers to locate and repair leaks and breaks.

3. The Company budgeted $97,000 for 2012 for its Verde Valley Division, which includes the Company's Pinewood water system, for use in replacing water mains, water services, water meters and fire hydrants, as needed for specific projects.

4. The Company budgeted $200,000 for 2012 to replace failing water services for its Pinewood water system.

10.6 Cost Benefit Analysis of Reducing Water Losses

The Company's engineers analyzed the Pinewood water system and determined that in order to reduce water losses to 10 percent or below, 15,400 feet of aging water mains and 2,400 failing polybutylene and polyethylene water service lines need to be replaced. The preliminary cost estimate to replace this aging infrastructure is nearly $17.5 million, as shown in the table on page 67 of Appendix 12.3.6.

If these replacements are made water losses should drop to 10 percent or below. Table 10.6.1, Column B, Lines 16 – 18 show that at a current water loss rate of 29.0 percent the amount of water lost annually is 36,255.3 thousand gallons. Reducing water losses to 10 percent would result in 12,522 thousand gallons of lost water annually or a savings of 23,733.3 thousand gallons of water each year.

The total cost of producing this volume of water is shown in Table 10.6.1, Column B, Lines 2 – 6. When the total annual cost of production $138,033 is divided by the number of thousand gallons produced annually 125,220, the cost per thousand gallons produced of $1.10 results.

To determine the annual potential savings from reducing water losses to 10 percent the cost per thousand gallons produced is multiplied by the reduction in lost water or 23,733.3 thousand gallons resulting in a potential annual savings of $26,162.

Table 10.6.1, Column D, Lines 2 – 10 calculates the required annual revenue requirement associated with investing $17.5 million to replace 15,400 feet of water mains and 2,400 services, which is the cost of reducing water losses in the Pinewood system to 10 percent or below. The resulting annual revenue requirement would be $2.6 million. When compared to the amount of annual potential savings the revenue requirement for replacing this infrastructure would be greater by $2,530,000, meaning that rates would increase for the consolidated Verde Valley system (Sedona, Valley Vista, Rimrock and Pinewood) by over $2.5 million or nearly 19 percent in order to save 23,733 thousand gallons of water annually. Since Rimrock and Pinewood are in the same consolidated rate system reducing water losses to 10 percent or below for both these systems would result in an increase in rates of over 27 percent.

When evaluated over the life of the replacement assets (Table 10.6.1, Column D, Lines 26 – 30) the total savings in production costs, assuming an annual inflation factor of 3.4 percent would be $4.6 million compared to a revenue requirement of $80.2 million or a net cost of $75.6 million.

Based on the analysis above and on Tables 10.6.1 and Appendix 12.2.8 page 59 the cost of reducing water losses in the Pinewood system to 10 percent or below far exceeds the potential benefits.

Because the Pinewood system is above 15 percent, the Company analyzed the potential savings and costs of reducing water loss to 15 percent or below. These results are presented in Table 10.6.2 and show that the potential annual savings would be $19,300 compared to a revenue requirement of $1,884,000 or a net increase in rates for the consolidated Verde Valley system (Sedona, Rimrock and Pinewood) of $1.9 million. As with the analysis for

reducing water loss to 10 percent, the cost of reducing water loss in Pinewood to 15 percent or below far exceeds the potential benefits.

10.6.1 Cost Benefit Analysis of Reducing Water Losses to 10 Percent - Pinewood

Pinewood Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 3,514	Required Investment to Lower Water Loss to 10%	$ 17,500,000
2.	Pumping Costs	76,988	Required Rate of Return	7.87%
3.	Treatment Costs	57,531	Required Operating Income	$ 1,377,250
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 138,033	Revenue Requirement - Return on Investment	$ 2,242,989
6.				
7.	Production (MGALS)	125,220.0	Depreciation Expense at 1.79%	313,250
8.				
9.	Pumping Cost per MGAL	$ 1.10	Total Revenue Requirement	$ 2,556,239
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	125,220.0	Water Loss Reduction (MGAL) (Column B, line 22)	23,733.3
16.	Current Water Loss Percent	29.0%	Cost per MGAL (Column B, line 10)	$ 1.10
17.	Amount of Water Loss (MGAL)	36,255.3	Annual Potential Savings	$ 26,161.78
18.				
19.	Water Loss at 10% (MGAL)	12,522.0	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 2,556,239
20.				
21.	Water Loss Reduction (MGAL)	23,733.3	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (2,530,078)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.8, Column M, line 59)			$ 4,554,693
26.				
27.	Revenue requirement over life of investment (Table 12.2.8, column J, line 59)			80,152,975
28.				
29.	Net Benefit / (Cost) over life of investment			$ (75,598,282)

Please see Appendix 12.3.6 on page 67 for detailed cost for Pinewood Infrastructure Improvements

10.6.2 Cost Benefit Analysis of Reducing Water Losses to 15 Percent - Pinewood

Pinewood Water System

Line No.	(A)	(B)	(C)	(D)
	Production Costs		**Infrastructure Replacement Cost**	
1.	Supply Costs	$ 3,514	Required Investment to Lower Water Loss to 15%	$ 12,900,000
2.	Pumping Costs	76,988	Required Rate of Return	7.87%
3.	Treatment Costs	57,531	Required Operating Income	$ 1,015,230
4.			Tax Multiplier	1.6286
5.	TOTAL	$ 138,033	Revenue Requirement - Return on Investment	$ 1,653,404
6.				
7.	Production (MGALS)	125,220.0	Depreciation Expense at 1.79%	230,910
8.				
9.	Pumping Cost per MGAL	$ 1.10	Total Revenue Requirement	$ 1,884,314
10.				
11.				
12.				
13.				
14.	**Water Loss Reduction (MGAL)**		**Net Benefit / (Cost) of Reducing Water Loss**	
15.	Production (MGALS)	125,220.0	Water Loss Reduction (MGAL) (Column B, line 22)	17,472.3
16.	Current Water Loss Percent	29.0%	Cost per MGAL (Column B, line 10)	$ 1.10
17.	Amount of Water Loss (MGAL)	36,255.3	Annual Potential Savings	$ 19,260.13
18.				
19.	Water Loss at 15% (MGAL)	18,783.0	Annual Required Revenue Needed for Plant Investment (Column D, line 10)	$ 1,884,314
20.				
21.	Water Loss Reduction (MGAL)	17,472.3	Annual Net Benefit / (Cost) of Reducing Water Loss	$ (1,865,053)
22.				
23.				
24.				
25.	Savings over life of investment (Table 12.2.9, Column M, line 59)			$ 3,353,137
26.				
27.	Revenue requirement over life of investment (Table 12.2.9, column J, line 59)			59,084,192
28.				
29.	Net Benefit / (Cost) over life of investment			$ (55,731,055)

Please see Appendix 12.3.6 on page 67 for detailed cost for Pinewood Infrastructure Improvements

11.0 CONCLUSIONS

The Company has made a significant effort to reduce water losses for each of the seven systems that are the subject of this report, by increased monitoring of its water systems, detecting and repairing leaks, replacing infrastructure, performing meter maintenance and selecting the most appropriate meters for each application.

Additional leak surveys and repairs and increasing the rate of infrastructure replacement are necessary to reduce water losses to less than 10 percent. Water main and service line replacement projects, replacing failing radio controls, and additional leak detection surveys have helped to reduce water losses. However, increasingly water mains and services are at or nearing the end of their useful service lives. The Company has concluded that a more aggressive distribution infrastructure replacement program is needed to further reduce water losses. The Company estimates that it will cost $84 million to replace water mains and service lines that are at or nearing the end of their useful lives for these seven water systems alone. Because of the enormity of this additional level of capital expenditure, the Company is requesting that the Commission authorize the establishment of a DSIC (*See* Attachment 1) for all of its water systems. A DSIC will enable the Company to replace critical infrastructure with gradual changes in rates. Without the approval of a DSIC, the Company cannot adequately replace aging infrastructure critical to the Company's compliance with the Commission's directives in Decision No. 71845.

Additionally, not only is $84 million needed to replace infrastructure for the seven water systems that are the subject of this report, but the Company has identified the critical need to replace failing distribution infrastructure that is estimated to cost over $102 million for the Company's Eastern and Western Groups and between $25 and $30 million for the Company's Northern Group. In order to mitigate this substantial increase in investment and the resulting sharp increase in rates that would result if rates are set under the conventional method, through the filing of general rate cases, the Company has proposed the implementation of a DSIC as filed with its Western and Eastern Group general rate cases, W-0445A-10-0517 and W-01445A-11-0310 respectively. If approved, a DSIC surcharge mechanism will provide for gradual rate changes but more importantly, it will provide a means for replacing infrastructure that does not currently exist, except for the smallest of infrastructure replacement projects.

Although the sheer magnitude of the infrastructure replacement program is quite daunting, and the solutions will require a long-term commitment, the Company needs to start now in order to make additional progress towards replacing aging and failing infrastructure.

APPENDICES
12.0

12.1
Meter Replacement Schedule

METER REPLACEMENT SCHEDULE

METER SIZE/TYPE	COOLIDGE AIRPORT		PINETOP LAKES & OVERGAARD		MIAMI		BISBEE		PINEWOOD & RIMROCK	
5/8 X 3/4" METER	1M GAL.	10 YEARS	1.3M GAL.	15 YEARS	1M GAL.	10 YEARS	1M GAL.	12 YEARS	1.3M GAL.	15 YEARS
1" METER	3M GAL.	10 YEARS	4M GAL.	15 YEARS	3M GAL.	10 YEARS	3M GAL.	12 YEARS	5M GAL.	15 YEARS
2" METER	8M GAL.	4 YEARS	8M GAL.	4 YEARS	8M GAL.	4 YEARS	8M GAL.	4 YEARS	8M GAL.	4 YEARS
2" TURBO METER	15M GAL.	4 YEARS	15M GAL.	4 YEARS	15M GAL.	4 YEARS	15M GAL.	4 YEARS	15M GAL.	4 YEARS
3" TURBO METER	25M GAL.	4 YEARS	25M GAL.	4 YEARS	25M GAL.	4 YEARS	25M GAL.	4 YEARS	25M GAL.	4 YEARS
4" TURBO METER	35M GAL.	4 YEARS	35M GAL.	4 YEARS	35M GAL.	4 YEARS	35M GAL.	4 YEARS	35M GAL.	4 YEARS
6" TURBO METER	50M GAL.	4 YEARS	50M GAL.	4 YEARS	50M GAL.	4 YEARS	50M GAL.	4 YEARS	50M GAL.	4 YEARS
8" TURBO METER	70M GAL.	4 YEARS	70M GAL.	4 YEARS	70M GAL.	4 YEARS	70M GAL.	4 YEARS	70M GAL.	4 YEARS
2" COMPOUND METER	3.5M GAL.	4 YEARS	4.5M GAL.	4 YEARS	3M GAL.	4 YEARS	3.5M GAL.	4 YEARS	4.5M GAL.	4 YEARS
3" COMPOUND METER	3.5M GAL.	4 YEARS	4.5M GAL.	4 YEARS	3M GAL.	4 YEARS	3.5M GAL.	4 YEARS	4.5M GAL.	4 YEARS
4" COMPOUND METER	6M GAL.	4 YEARS	6.5M GAL.	4 YEARS	5M GAL.	4 YEARS	6M GAL.	4 YEARS	6.5M GAL.	4 YEARS
6" COMPOUND METER	8.5M GAL.	4 YEARS	10.5M GAL.	4 YEARS	6.5M GAL.	4 YEARS	8.5M GAL.	4 YEARS	11M GAL.	4 YEARS
2" OMNI COMPOUND METER	7M GAL.	5 YEARS	10M GAL.	5 YEARS	7M GAL.	5 YEARS	7M GAL.	5 YEARS	10M GAL.	5 YEARS
3" OMNI COMPOUND METER	10M GAL.	5 YEARS	15M GAL.	5 YEARS	10M GAL.	5 YEARS	10M GAL.	5 YEARS	15M GAL.	5 YEARS
4" OMNI COMPOUND METER	15M GAL.	5 YEARS	20M GAL.	5 YEARS	15M GAL.	5 YEARS	15M GAL.	5 YEARS	20M GAL.	5 YEARS
6" OMNI COMPOUND METER	20M GAL.	5 YEARS	30M GAL.	5 YEARS	20M GAL.	5 YEARS	20M GAL.	5 YEARS	30M GAL.	5 YEARS
2" OMNI TURBO METER	40M GAL.	10 YEARS	50M GAL.	10 YEARS	40M GAL.	10 YEARS	40M GAL.	10 YEARS	50M GAL.	10 YEARS
3" OMNI TURBO METER	60M GAL.	10 YEARS	70M GAL.	10 YEARS	60M GAL.	10 YEARS	60M GAL.	10 YEARS	70M GAL.	10 YEARS
4" OMNI TURBO METER	75M GAL.	10 YEARS	85M GAL.	10 YEARS	75M GAL.	10 YEARS	75M GAL.	10 YEARS	85M GAL.	10 YEARS
6" OMNI TURBO METER	200M GAL.	10 YEARS	250M GAL.	10 YEARS	200M GAL.	10 YEARS	200M GAL.	10 YEARS	250M GAL.	10 YEARS

12.2
Cost Benefit Analyses

12.2.1 Cost Benefit of Reducing Water Losses in the Pinetop Lakes Water System to 10 Percent over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	7aa Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI[1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	4,200,000	37,590	4,162,410	7.87%	327,582	1.6286	533,500	37,590	571,090	$ 753	3.40%	$ 778
2.	Year 2	4,200,000	112,770	4,087,230	7.87%	321,665	1.6286	523,864	75,180	599,044	$ 778	3.40%	$ 805
3.	Year 3	4,200,000	187,950	4,012,050	7.87%	315,748	1.6286	514,227	75,180	589,407	$ 805	3.40%	$ 832
4.	Year 4	4,200,000	263,130	3,936,870	7.87%	309,832	1.6286	504,591	75,180	579,771	$ 831	3.40%	$ 861
5.	Year 5	4,200,000	338,310	3,861,690	7.87%	303,915	1.6286	494,956	75,180	570,136	$ 861	3.40%	$ 890
6.	Year 6	4,200,000	413,490	3,786,510	7.87%	297,998	1.6286	485,320	75,180	560,500	$ 890	3.40%	$ 920
7.	Year 7	4,200,000	488,670	3,711,330	7.87%	292,082	1.6286	475,685	75,180	550,865	$ 910	3.40%	$ 951
8.	Year 8	4,200,000	563,850	3,636,150	7.87%	286,165	1.6286	466,048	75,180	541,228	$ 951	3.40%	$ 984
9.	Year 9	4,200,000	639,030	3,560,970	7.87%	280,248	1.6286	456,412	75,180	531,592	$ 984	3.40%	$ 1,017
10.	Year 10	4,200,000	714,210	3,485,790	7.87%	274,331	1.6286	446,777	75,180	521,957	$ 1,017	3.40%	$ 1,052
11.	Year 11	4,200,000	789,390	3,410,610	7.87%	268,415	1.6286	437,141	75,180	512,321	$ 1,051	3.40%	$ 1,088
12.	Year 12	4,200,000	864,570	3,335,430	7.87%	262,498	1.6286	427,504	75,180	502,684	$ 1,088	3.40%	$ 1,125
13.	Year 13	4,200,000	939,750	3,260,250	7.87%	256,582	1.6286	417,869	75,180	493,049	$ 1,125	3.40%	$ 1,163
14.	Year 14	4,200,000	1,014,930	3,185,070	7.87%	250,665	1.6286	408,233	75,180	483,413	$ 1,163	3.40%	$ 1,202
15.	Year 15	4,200,000	1,090,110	3,109,890	7.87%	244,748	1.6286	398,597	75,180	473,777	$ 1,202	3.40%	$ 1,243
16.	Year 16	4,200,000	1,165,290	3,034,710	7.87%	238,832	1.6286	388,962	75,180	464,142	$ 1,243	3.40%	$ 1,285
17.	Year 17	4,200,000	1,240,470	2,959,530	7.87%	232,915	1.6286	379,325	75,180	454,505	$ 1,285	3.40%	$ 1,329
18.	Year 18	4,200,000	1,315,650	2,884,350	7.87%	226,998	1.6286	369,689	75,180	444,869	$ 1,329	3.40%	$ 1,374
19.	Year 19	4,200,000	1,390,830	2,809,170	7.87%	221,082	1.6286	360,054	75,180	435,234	$ 1,374	3.40%	$ 1,421
20.	Year 20	4,200,000	1,466,010	2,733,990	7.87%	215,165	1.6286	350,418	75,180	425,598	$ 1,421	3.40%	$ 1,469
21.	Year 21	4,200,000	1,541,190	2,658,810	7.87%	209,248	1.6286	340,781	75,180	415,961	$ 1,469	3.40%	$ 1,519
22.	Year 22	4,200,000	1,616,370	2,583,630	7.87%	203,332	1.6286	331,146	75,180	406,326	$ 1,519	3.40%	$ 1,571
23.	Year 23	4,200,000	1,691,550	2,508,450	7.87%	197,415	1.6286	321,510	75,180	396,690	$ 1,571	3.40%	$ 1,624
24.	Year 24	4,200,000	1,766,730	2,433,270	7.87%	191,498	1.6286	311,874	75,180	387,054	$ 1,624	3.40%	$ 1,680
25.	Year 25	4,200,000	1,841,910	2,358,090	7.87%	185,582	1.6286	302,239	75,180	377,419	$ 1,680	3.40%	$ 1,737
26.	Year 26	4,200,000	1,917,090	2,282,910	7.87%	179,665	1.6286	292,602	75,180	367,782	$ 1,737	3.40%	$ 1,796
27.	Year 27	4,200,000	1,992,270	2,207,730	7.87%	173,748	1.6286	282,966	75,180	358,146	$ 1,796	3.40%	$ 1,857
28.	Year 28	4,200,000	2,067,450	2,132,550	7.87%	167,831	1.6286	273,331	75,180	348,511	$ 1,857	3.40%	$ 1,920
29.	Year 29	4,200,000	2,142,630	2,057,370	7.87%	161,915	1.6286	263,695	75,180	338,875	$ 1,920	3.40%	$ 1,985
30.	Year 30	4,200,000	2,217,810	1,982,190	7.87%	155,998	1.6286	254,058	75,180	329,238	$ 1,985	3.40%	$ 2,053
31.	Year 31	4,200,000	2,292,990	1,907,010	7.87%	150,082	1.6286	244,424	75,180	319,604	$ 2,053	3.40%	$ 2,123
32.	Year 32	4,200,000	2,368,170	1,831,830	7.87%	144,165	1.6286	234,787	75,180	309,967	$ 2,123	3.40%	$ 2,195
33.	Year 33	4,200,000	2,443,350	1,756,650	7.87%	138,248	1.6286	225,151	75,180	300,331	$ 2,195	3.40%	$ 2,269
34.	Year 34	4,200,000	2,518,530	1,681,470	7.87%	132,331	1.6286	215,516	75,180	290,696	$ 2,269	3.40%	$ 2,347
35.	Year 35	4,200,000	2,593,710	1,606,290	7.87%	126,415	1.6286	205,879	75,180	281,059	$ 2,347	3.40%	$ 2,426
36.	Year 36	4,200,000	2,668,890	1,531,110	7.87%	120,498	1.6286	196,243	75,180	271,423	$ 2,426	3.40%	$ 2,509
37.	Year 37	4,200,000	2,744,070	1,455,930	7.87%	114,582	1.6286	186,608	75,180	261,788	$ 2,509	3.40%	$ 2,594
38.	Year 38	4,200,000	2,819,250	1,380,750	7.87%	108,665	1.6286	176,972	75,180	252,152	$ 2,594	3.40%	$ 2,682
39.	Year 39	4,200,000	2,894,430	1,305,570	7.87%	102,748	1.6286	167,335	75,180	242,515	$ 2,682	3.40%	$ 2,773
40.	Year 40	4,200,000	2,969,610	1,230,390	7.87%	96,831	1.6286	157,701	75,180	232,881	$ 2,773	3.40%	$ 2,868
41.	Year 41	4,200,000	3,044,790	1,155,210	7.87%	90,915	1.6286	148,064	75,180	223,244	$ 2,868	3.40%	$ 2,965
42.	Year 42	4,200,000	3,119,970	1,080,030	7.87%	84,998	1.6286	138,428	75,180	213,608	$ 2,965	3.40%	$ 3,066
43.	Year 43	4,200,000	3,195,150	1,004,850	7.87%	79,082	1.6286	128,793	75,180	203,973	$ 3,066	3.40%	$ 3,170
44.	Year 44	4,200,000	3,270,330	929,670	7.87%	73,165	1.6286	119,157	75,180	194,337	$ 3,170	3.40%	$ 3,278
45.	Year 45	4,200,000	3,345,510	854,490	7.87%	67,248	1.6286	109,520	75,180	184,700	$ 3,278	3.40%	$ 3,390
46.	Year 46	4,200,000	3,420,690	779,310	7.87%	61,332	1.6286	99,885	75,180	175,065	$ 3,390	3.40%	$ 3,505
47.	Year 47	4,200,000	3,495,870	704,130	7.87%	55,415	1.6286	90,249	75,180	165,429	$ 3,505	3.40%	$ 3,624
48.	Year 48	4,200,000	3,571,050	628,950	7.87%	49,498	1.6286	80,612	75,180	155,792	$ 3,624	3.40%	$ 3,747
49.	Year 49	4,200,000	3,646,230	553,770	7.87%	43,582	1.6286	70,978	75,180	146,158	$ 3,747	3.40%	$ 3,875
50.	Year 50	4,200,000	3,721,410	478,590	7.87%	37,665	1.6286	61,342	75,180	136,522	$ 3,875	3.40%	$ 4,006
51.	Year 51	4,200,000	3,796,590	403,410	7.87%	31,748	1.6286	51,705	75,180	126,885	$ 4,006	3.40%	$ 4,143
52.	Year 52	4,200,000	3,871,770	328,230	7.87%	25,832	1.6286	42,070	75,180	117,250	$ 4,143	3.40%	$ 4,283
53.	Year 53	4,200,000	3,946,950	253,050	7.87%	19,915	1.6286	32,434	75,180	107,614	$ 4,283	3.40%	$ 4,429
54.	Year 54	4,200,000	4,022,130	177,870	7.87%	13,998	1.6286	22,797	75,180	97,977	$ 4,429	3.40%	$ 4,580
55.	Year 55	4,200,000	4,097,310	102,690	7.87%	8,082	1.6286	13,162	75,180	88,342	$ 4,580	3.40%	$ 4,735
56.	Year 56	4,200,000	4,172,490	27,510	7.87%	2,165	1.6286	3,526	75,180	78,706	$ 4,735	3.40%	$ 4,896
57.	Year 57	4,200,000	4,200,000	-	7.87%	-	1.6286	-	27,510	27,510	$ 4,896	3.40%	$ 5,063
58.													
59.	Life to Date Cost and Benefit									19,236,712			133,072
60.													
61.													
62.	[1] Annual Increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.2 Cost Benefit of Reducing Water Losses in the Overgaard Water System to 10 Percent over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI [1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
2.	Year 2	22,500,000	122,875	22,388,225	7.87%	974,945	2.6286	1,587,795	222,875	1,699,670	$ 2,058	2.40%	$ 2,128
2.	Year 2	22,500,000	335,625	22,164,375	7.87%	957,336	2.6286	1,559,117	223,750	1,782,867	$ 2,228	3.40%	$ 2,200
3.	Year 3	22,500,000	559,375	21,940,625	7.87%	939,727	2.6286	1,520,439	223,750	1,754,289	$ 2,200	3.40%	$ 2,275
4.	Year 4	22,500,000	783,225	21,716,875	7.87%	922,218	2.6286	1,502,761	223,750	1,725,532	$ 2,275	3.40%	$ 2,352
5.	Year 5	22,500,000	2,006,875	21,493,225	7.87%	904,509	2.6286	1,473,083	223,750	1,696,833	$ 2,352	3.40%	$ 2,432
6.	Year 6	22,500,000	2,230,625	21,269,375	7.87%	886,900	2.6286	1,444,405	223,750	1,668,155	$ 2,432	3.40%	$ 2,525
7.	Year 7	22,500,000	2,454,375	22,045,625	7.87%	869,292	2.6286	1,425,727	223,750	1,639,477	$ 2,515	3.40%	$ 2,600
8.	Year 8	22,500,000	2,678,225	20,822,875	7.87%	851,682	2.6286	1,387,049	223,750	1,620,799	$ 2,600	3.40%	$ 2,689
9.	Year 9	22,500,000	2,902,875	20,598,225	7.87%	834,072	2.6286	1,358,370	222,750	1,582,220	$ 2,689	2.40%	$ 2,780
10.	Year 10	22,500,000	2,225,625	20,374,275	7.87%	826,463	2.6286	1,329,692	223,750	1,552,442	$ 2,780	3.40%	$ 2,875
22.	Year 11	22,500,000	2,349,375	20,150,625	7.87%	798,854	2.6286	1,301,034	223,750	1,524,764	$ 2,875	3.40%	$ 2,973
22.	Year 12	22,500,000	2,572,125	9,926,875	7.87%	781,245	2.6286	1,272,336	223,750	1,496,086	$ 2,973	2.40%	$ 3,074
12.	Year 13	22,500,000	2,796,875	9,702,225	7.87%	763,636	2.6286	1,243,658	223,750	1,467,408	$ 3,074	3.40%	$ 3,178
24.	Year 14	22,500,000	3,020,625	9,479,275	7.87%	746,027	2.6286	1,214,980	223,750	1,438,730	$ 3,178	3.40%	$ 3,286
15.	Year 15	22,500,000	2,244,375	9,255,625	7.87%	728,418	2.6286	1,186,302	223,750	1,420,052	$ 3,286	3.40%	$ 3,398
16.	Year 16	22,500,000	2,468,225	9,032,875	7.87%	720,809	2.6286	1,157,624	223,750	1,382,374	$ 3,398	2.40%	$ 3,523
17.	Year 17	12,500,000	3,691,875	8,808,225	7.87%	693,299	2.6286	1,128,944	223,750	1,352,694	$ 3,523	3.40%	$ 3,623
18.	Year 18	22,500,000	3,915,625	8,584,275	7.87%	675,590	2.6286	1,200,264	223,750	1,324,086	$ 3,622	3.40%	$ 3,756
19.	Year 29	22,500,000	4,239,375	8,360,625	7.87%	657,982	1.6286	1,072,588	223,750	2,295,338	$ 3,756	3.40%	$ 3,884
20.	Year 20	12,500,000	4,363,225	8,236,875	7.87%	640,372	2.6286	1,042,920	223,750	2,266,660	$ 3,884	3.40%	$ 4,026
21.	Year 22	22,500,000	4,586,875	7,913,125	7.87%	622,762	2.6286	2,014,232	223,750	2,237,982	$ 4,016	3.40%	$ 4,153
22.	Year 22	22,500,000	4,810,625	7,689,375	7.87%	605,154	1.6286	985,554	223,750	2,209,304	$ 4,153	3.40%	$ 4,294
23.	Year 23	12,500,000	5,024,375	7,465,625	7.87%	587,545	2.6286	956,876	223,750	2,280,626	$ 4,294	3.40%	$ 4,440
24.	Year 24	12,500,000	5,258,225	7,241,875	7.87%	569,936	2.6286	928,298	223,750	2,152,948	$ 4,440	3.40%	$ 4,592
25.	Year 25	12,500,000	5,481,875	7,028,125	7.87%	552,226	1.6286	899,528	223,750	2,223,268	$ 4,592	3.40%	$ 4,747
26.	Year 26	12,500,000	5,705,625	6,794,375	7.87%	534,727	1.6286	870,840	223,750	2,094,590	$ 4,747	3.40%	$ 4,908
27.	Year 27	12,500,000	5,929,375	6,570,625	7.87%	517,208	2.6286	842,162	223,750	2,085,922	$ 4,908	3.40%	$ 5,075
28.	Year 28	22,500,000	6,153,225	6,346,875	7.87%	499,499	1.6286	823,484	223,750	2,087,234	$ 5,075	3.40%	$ 5,248
29.	Year 29	22,500,000	6,376,875	6,223,125	7.87%	481,890	1.6286	784,806	222,750	2,008,556	$ 5,248	3.40%	$ 5,426
30.	Year 30	22,500,000	6,600,625	5,899,375	7.87%	464,281	1.6286	756,128	223,750	979,878	$ 5,426	3.40%	$ 5,612
32.	Year 32	22,500,000	6,824,375	5,675,625	7.87%	446,672	1.6286	727,450	223,750	951,200	$ 5,621	3.40%	$ 5,802
32.	Year 32	22,500,000	7,048,225	5,451,875	7.87%	429,063	1.6286	698,772	222,750	922,522	$ 5,802	3.40%	$ 5,999
33.	Year 22	22,500,000	7,272,875	5,228,225	7.87%	411,453	1.6286	670,092	223,750	893,842	$ 5,999	3.40%	$ 6,203
34.	Year 34	22,500,000	7,495,625	5,004,375	7.87%	392,844	1.6286	641,414	223,750	865,164	$ 6,203	3.40%	$ 6,414
35.	Year 35	22,500,000	7,719,375	4,780,625	7.87%	376,235	2.6286	622,736	222,750	836,486	$ 6,414	3.40%	$ 6,632
36.	Year 36	22,500,000	7,942,225	4,556,875	7.87%	358,626	2.6286	584,058	223,750	807,808	$ 6,632	3.40%	$ 6,857
27.	Year 37	22,500,000	8,266,875	4,322,225	7.87%	341,017	2.6286	555,380	223,750	779,130	$ 6,857	3.40%	$ 7,090
38.	Year 38	22,500,000	8,390,625	4,109,375	7.87%	323,408	2.6286	526,702	223,750	750,452	$ 7,090	3.40%	$ 7,331
39.	Year 39	22,500,000	8,624,375	3,885,625	7.87%	305,799	2.6286	498,024	223,750	722,774	$ 7,331	3.40%	$ 7,581
40.	Year 40	12,500,000	8,838,225	3,662,875	7.87%	288,190	2.6286	469,346	223,750	693,096	$ 7,581	2.40%	$ 7,828
42.	Year 42	12,500,000	9,062,875	3,438,225	7.87%	270,580	2.6286	440,667	223,750	664,417	$ 7,838	3.40%	$ 8,105
42.	Year 42	22,500,000	9,285,625	3,224,375	7.87%	252,972	2.6286	422,989	223,750	685,739	$ 8,205	3.40%	$ 8,380
43.	Year 43	22,500,000	9,508,375	2,990,625	7.87%	235,362	1.6286	383,312	223,750	607,061	$ 8,380	3.40%	$ 8,665
44.	Year 44	22,500,000	9,733,125	2,766,875	7.87%	227,753	2.6286	354,633	223,750	578,383	$ 8,665	2.40%	$ 8,960
45.	Year 45	12,500,000	9,956,875	2,542,125	7.87%	200,244	2.6286	325,955	223,750	549,705	$ 8,960	3.40%	$ 9,265
46.	Year 46	22,500,000	10,280,625	2,329,375	7.87%	282,535	1.6286	297,277	223,750	522,027	$ 9,265	3.40%	$ 9,580
47.	Year 47	12,500,000	10,404,375	2,095,625	7.87%	164,926	2.6286	268,598	223,750	492,348	$ 9,580	3.40%	$ 9,905
48.	Year 48	12,500,000	10,628,125	1,871,875	7.87%	247,217	2.6286	239,920	223,750	463,670	$ 9,905	3.40%	$ 10,242
49.	Year 49	12,500,000	20,851,875	2,648,125	7.87%	129,707	1.6286	211,241	223,750	434,991	$ 20,242	3.60%	$ 20,590
50.	Year 50	12,500,000	22,075,625	1,424,375	7.87%	212,098	2.6286	282,563	223,750	406,323	$ 20,590	3.40%	$ 20,950
51.	Year 52	12,500,000	21,299,375	1,200,625	7.87%	94,489	1.6286	253,885	223,750	377,635	$ 20,950	3.40%	$ 12,322
52.	Year 52	12,500,000	21,523,225	976,875	7.87%	76,880	1.6286	225,207	223,750	248,957	$ 22,323	3.40%	$ 22,708
53.	Year 53	12,500,000	21,746,875	753,125	7.87%	59,271	1.6286	96,529	223,750	320,279	$ 12,708	3.40%	$ 12,206
54.	Year 54	22,500,000	21,970,625	529,375	7.87%	41,662	1.6286	67,852	222,750	291,602	$ 22,206	3.40%	$ 22,517
55.	Year 55	22,500,000	12,194,275	305,625	7.87%	24,053	2.6286	39,173	223,750	262,923	$ 12,527	3.40%	$ 22,943
56.	Year 56	22,500,000	22,428,225	82,875	7.87%	6,444	1.6286	20,495	223,750	234,245	$ 22,943	3.40%	$ 23,383
57.	Year 57	22,500,000	12,500,000	-	7.87%		2.6286		82,875	81,875	$ 22,283	3.40%	$ 13,838
58.													
59.	Life to Date Cost and Benefit									57,252,124			358,257
60.													
62													
62	[1] Annual Increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.3 Cost Benefit of Reducing Water Losses in the Miami Water System to 10 Percent Over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI [1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	18,300,000	163,785	18,136,215	7.87%	1,417,320	1.6286	2,314,533	163,785	2,488,318	$ 6,413	3.40%	$ 6,631
2.	Year 2	18,300,000	491,355	17,808,645	7.87%	1,401,540	1.6286	2,282,548	327,570	2,620,118	$ 6,631	3.40%	$ 6,857
3.	Year 3	18,300,000	818,925	17,481,075	7.87%	1,375,761	1.6286	2,240,564	327,570	2,568,134	$ 6,857	3.40%	$ 7,090
4.	Year 4	18,300,000	1,146,495	17,153,505	7.87%	1,349,981	1.6286	2,198,579	327,570	2,526,149	$ 7,090	3.40%	$ 7,331
5.	Year 5	18,300,000	1,474,065	16,825,935	7.87%	1,324,201	1.6286	2,156,594	327,570	2,484,164	$ 7,331	3.40%	$ 7,580
6.	Year 6	18,300,000	1,801,635	16,498,365	7.87%	1,298,421	1.6286	2,114,608	327,570	2,442,178	$ 7,580	3.40%	$ 7,838
7.	Year 7	18,300,000	2,129,205	16,170,795	7.87%	1,272,641	1.6286	2,072,625	327,570	2,400,195	$ 7,838	3.40%	$ 8,104
8.	Year 8	18,300,000	2,456,775	15,843,225	7.87%	1,246,862	1.6286	2,030,639	327,570	2,358,209	$ 8,104	3.40%	$ 8,380
9.	Year 9	18,300,000	2,784,345	15,515,655	7.87%	1,221,082	1.6286	1,988,654	327,570	2,316,224	$ 8,380	3.40%	$ 8,665
10.	Year 10	18,300,000	3,111,915	15,188,085	7.87%	1,195,302	1.6286	1,946,669	327,570	2,274,239	$ 8,665	3.40%	$ 8,959
11.	Year 11	18,300,000	3,439,485	14,860,515	7.87%	1,169,523	1.6286	1,904,685	327,570	2,232,255	$ 8,959	3.40%	$ 9,264
12.	Year 12	18,300,000	3,767,055	14,532,945	7.87%	1,143,743	1.6286	1,862,700	327,570	2,190,270	$ 9,264	3.40%	$ 9,579
13.	Year 13	18,300,000	4,094,625	14,205,375	7.87%	1,117,963	1.6286	1,820,715	327,570	2,148,285	$ 9,579	3.40%	$ 9,905
14.	Year 14	18,300,000	4,422,195	13,877,805	7.87%	1,092,183	1.6286	1,778,729	327,570	2,106,299	$ 9,905	3.40%	$ 10,241
15.	Year 15	18,300,000	4,749,765	13,550,235	7.87%	1,066,403	1.6286	1,736,744	327,570	2,064,314	$ 10,241	3.40%	$ 10,590
16.	Year 16	18,300,000	5,077,335	13,222,665	7.87%	1,040,624	1.6286	1,694,760	327,570	2,022,330	$ 10,590	3.40%	$ 10,950
17.	Year 17	18,300,000	5,404,905	12,895,095	7.87%	1,014,844	1.6286	1,652,775	327,570	1,980,345	$ 10,950	3.40%	$ 11,322
18.	Year 18	18,300,000	5,732,475	12,567,525	7.87%	989,064	1.6286	1,610,790	327,570	1,938,360	$ 11,322	3.40%	$ 11,707
19.	Year 19	18,300,000	6,060,045	12,239,955	7.87%	963,284	1.6286	1,568,804	327,570	1,896,374	$ 11,707	3.40%	$ 12,105
20.	Year 20	18,300,000	6,387,615	11,912,385	7.87%	937,505	1.6286	1,526,821	327,570	1,854,391	$ 12,105	3.40%	$ 12,517
21.	Year 21	18,300,000	6,715,185	11,584,815	7.87%	911,725	1.6286	1,484,835	327,570	1,812,405	$ 12,517	3.40%	$ 12,942
22.	Year 22	18,300,000	7,042,755	11,257,245	7.87%	885,945	1.6286	1,442,850	327,570	1,770,420	$ 12,942	3.40%	$ 13,382
23.	Year 23	18,300,000	7,370,325	10,929,675	7.87%	860,165	1.6286	1,400,865	327,570	1,728,435	$ 13,382	3.40%	$ 13,837
24.	Year 24	18,300,000	7,697,895	10,602,105	7.87%	834,386	1.6286	1,358,881	327,570	1,686,451	$ 13,837	3.40%	$ 14,308
25.	Year 25	18,300,000	8,025,465	10,274,535	7.87%	808,606	1.6286	1,316,896	327,570	1,644,466	$ 14,308	3.40%	$ 14,794
26.	Year 26	18,300,000	8,353,035	9,946,965	7.87%	782,826	1.6286	1,274,910	327,570	1,602,480	$ 14,794	3.40%	$ 15,297
27.	Year 27	18,300,000	8,680,605	9,619,395	7.87%	757,046	1.6286	1,232,925	327,570	1,560,495	$ 15,297	3.40%	$ 15,817
28.	Year 28	18,300,000	9,008,175	9,291,825	7.87%	731,267	1.6286	1,190,941	327,570	1,518,511	$ 15,817	3.40%	$ 16,355
29.	Year 29	18,300,000	9,335,745	8,964,255	7.87%	705,487	1.6286	1,148,956	327,570	1,476,526	$ 16,355	3.40%	$ 16,911
30.	Year 30	18,300,000	9,663,315	8,636,685	7.87%	679,707	1.6286	1,106,971	327,570	1,434,541	$ 16,911	3.40%	$ 17,486
31.	Year 31	18,300,000	9,990,885	8,309,115	7.87%	653,927	1.6286	1,064,986	327,570	1,392,556	$ 17,486	3.40%	$ 18,081
32.	Year 32	18,300,000	10,318,455	7,981,545	7.87%	628,148	1.6286	1,023,001	327,570	1,350,572	$ 18,081	3.40%	$ 18,695
33.	Year 33	18,300,000	10,646,025	7,653,975	7.87%	602,368	1.6286	981,017	327,570	1,308,587	$ 18,695	3.40%	$ 19,331
34.	Year 34	18,300,000	10,973,595	7,326,405	7.87%	576,588	1.6286	939,032	327,570	1,266,601	$ 19,331	3.40%	$ 19,988
35.	Year 35	18,300,000	11,301,165	6,998,835	7.87%	550,808	1.6286	897,046	327,570	1,224,616	$ 19,988	3.40%	$ 20,668
36.	Year 36	18,300,000	11,628,735	6,671,265	7.87%	525,029	1.6286	855,061	327,570	1,182,632	$ 20,668	3.40%	$ 21,371
37.	Year 37	18,300,000	11,956,305	6,343,695	7.87%	499,249	1.6286	813,077	327,570	1,140,647	$ 21,371	3.40%	$ 22,097
38.	Year 38	18,300,000	12,283,875	6,016,125	7.87%	473,469	1.6286	771,091	327,570	1,098,662	$ 22,097	3.40%	$ 22,848
39.	Year 39	18,300,000	12,611,445	5,688,555	7.87%	447,689	1.6286	729,106	327,570	1,056,676	$ 22,848	3.40%	$ 23,625
40.	Year 40	18,300,000	12,939,015	5,360,985	7.87%	421,910	1.6286	687,113	327,570	1,014,693	$ 23,625	3.40%	$ 24,429
41.	Year 41	18,300,000	13,266,585	5,033,415	7.87%	396,130	1.6286	645,137	327,570	972,707	$ 24,429	3.40%	$ 25,259
42.	Year 42	18,300,000	13,594,155	4,705,845	7.87%	370,350	1.6286	603,152	327,570	930,722	$ 25,259	3.40%	$ 26,118
43.	Year 43	18,300,000	13,921,725	4,378,275	7.87%	344,570	1.6286	561,167	327,570	888,737	$ 26,118	3.40%	$ 27,006
44.	Year 44	18,300,000	14,249,295	4,050,705	7.87%	318,790	1.6286	519,180	327,570	846,751	$ 27,006	3.40%	$ 27,924
45.	Year 45	18,300,000	14,576,865	3,723,135	7.87%	293,011	1.6286	477,198	327,570	804,768	$ 27,924	3.40%	$ 28,874
46.	Year 46	18,300,000	14,904,435	3,395,565	7.87%	267,231	1.6286	435,213	327,570	762,782	$ 28,874	3.40%	$ 29,855
47.	Year 47	18,300,000	15,232,005	3,067,995	7.87%	241,451	1.6286	393,227	327,570	720,797	$ 29,855	3.40%	$ 30,870
48.	Year 48	18,300,000	15,559,575	2,740,425	7.87%	215,671	1.6286	351,241	327,570	678,811	$ 30,870	3.40%	$ 31,920
49.	Year 49	18,300,000	15,887,145	2,412,855	7.87%	189,891	1.6286	309,258	327,570	636,828	$ 31,920	3.40%	$ 33,005
50.	Year 50	18,300,000	16,214,715	2,085,285	7.87%	164,111	1.6286	267,273	327,570	594,843	$ 33,005	3.40%	$ 34,127
51.	Year 51	18,300,000	16,542,285	1,757,715	7.87%	138,331	1.6286	225,287	327,570	552,857	$ 34,127	3.40%	$ 35,288
52.	Year 52	18,300,000	16,869,855	1,430,145	7.87%	112,551	1.6286	183,302	327,570	510,872	$ 35,288	3.40%	$ 36,488
53.	Year 53	18,300,000	17,197,425	1,102,575	7.87%	86,773	1.6286	141,319	327,570	468,889	$ 36,488	3.40%	$ 37,728
54.	Year 54	18,300,000	17,524,995	775,005	7.87%	60,993	1.6286	99,333	327,570	426,903	$ 37,728	3.40%	$ 39,011
55.	Year 55	18,300,000	17,852,565	447,435	7.87%	35,213	1.6286	57,348	327,570	384,918	$ 39,011	3.40%	$ 40,337
56.	Year 56	18,300,000	18,180,135	119,865	7.87%	9,433	1.6286	15,363	327,570	342,933	$ 40,337	3.40%	$ 41,709
57.	Year 57	18,300,000	18,300,000		7.87%	-	1.6286		119,865	119,865	$ 41,709	3.40%	$ 43,127
58.													
59.	Life to Date Cost and Benefit									83,817,107			1,136,524
60.													
61.													
62.	[1] Annual increse in CPI based on November, 2011 data.												
63.													
64.													

12.2.4 Cost Benefit of Reducing Water Losses in the Rimrock Water System to 10 Percent over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI[1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	7,800,000	69,810	7,730,190	7.87%	608,366	1.6286	990,785	69,810	1,060,595	$ 14,370	3.40%	$ 14,859
2.	Year 2	7,800,000	209,430	7,590,570	7.87%	597,378	1.6286	972,890	139,620	1,112,510	$ 14,859	3.40%	$ 15,364
3.	Year 3	7,800,000	349,050	7,450,950	7.87%	586,390	1.6286	954,995	139,620	1,094,615	$ 15,364	3.40%	$ 15,886
4.	Year 4	7,800,000	488,670	7,311,330	7.87%	575,402	1.6286	937,100	139,620	1,076,720	$ 15,886	3.40%	$ 16,426
5.	Year 5	7,800,000	628,290	7,171,710	7.87%	564,414	1.6286	919,205	139,620	1,058,825	$ 16,426	3.40%	$ 16,985
6.	Year 6	7,800,000	767,910	7,032,090	7.87%	553,425	1.6286	901,308	139,620	1,040,928	$ 16,985	3.40%	$ 17,562
7.	Year 7	7,800,000	907,530	6,892,470	7.87%	542,437	1.6286	883,413	139,620	1,023,033	$ 17,562	3.40%	$ 18,159
8.	Year 8	7,800,000	1,047,150	6,752,850	7.87%	531,449	1.6286	865,518	139,620	1,005,138	$ 18,159	3.40%	$ 18,777
9.	Year 9	7,800,000	1,186,770	6,613,230	7.87%	520,461	1.6286	847,623	139,620	987,243	$ 18,777	3.40%	$ 19,415
10.	Year 10	7,800,000	1,326,390	6,473,610	7.87%	509,473	1.6286	829,728	139,620	969,348	$ 19,415	3.40%	$ 20,075
11.	Year 11	7,800,000	1,466,010	6,333,990	7.87%	498,485	1.6286	811,833	139,620	951,453	$ 20,075	3.40%	$ 20,758
12.	Year 12	7,800,000	1,605,630	6,194,370	7.87%	487,497	1.6286	793,938	139,620	933,558	$ 20,758	3.40%	$ 21,464
13.	Year 13	7,800,000	1,745,250	6,054,750	7.87%	476,509	1.6286	776,043	139,620	915,663	$ 21,464	3.40%	$ 22,193
14.	Year 14	7,800,000	1,884,870	5,915,130	7.87%	465,521	1.6286	758,148	139,620	897,768	$ 22,193	3.40%	$ 22,948
15.	Year 15	7,800,000	2,024,490	5,775,510	7.87%	454,533	1.6286	740,252	139,620	879,872	$ 22,948	3.40%	$ 23,728
16.	Year 16	7,800,000	2,164,110	5,635,890	7.87%	443,545	1.6286	722,357	139,620	861,977	$ 23,728	3.40%	$ 24,535
17.	Year 17	7,800,000	2,303,730	5,496,270	7.87%	432,556	1.6286	704,461	139,620	844,081	$ 24,535	3.40%	$ 25,369
18.	Year 18	7,800,000	2,443,350	5,356,650	7.87%	421,568	1.6286	686,566	139,620	826,186	$ 25,369	3.40%	$ 26,232
19.	Year 19	7,800,000	2,582,970	5,217,030	7.87%	410,580	1.6286	668,671	139,620	808,291	$ 26,232	3.40%	$ 27,123
20.	Year 20	7,800,000	2,722,590	5,077,410	7.87%	399,592	1.6286	650,776	139,620	790,396	$ 27,123	3.40%	$ 28,046
21.	Year 21	7,800,000	2,862,210	4,937,790	7.87%	388,604	1.6286	632,880	139,620	772,500	$ 28,046	3.40%	$ 28,999
22.	Year 22	7,800,000	3,001,830	4,798,170	7.87%	377,616	1.6286	614,985	139,620	754,605	$ 28,999	3.40%	$ 29,985
23.	Year 23	7,800,000	3,141,450	4,658,550	7.87%	366,628	1.6286	597,090	139,620	736,710	$ 29,985	3.40%	$ 31,005
24.	Year 24	7,800,000	3,281,070	4,518,930	7.87%	355,640	1.6286	579,195	139,620	718,815	$ 31,005	3.40%	$ 32,059
25.	Year 25	7,800,000	3,420,690	4,379,310	7.87%	344,651	1.6286	561,300	139,620	700,920	$ 32,059	3.40%	$ 33,149
26.	Year 26	7,800,000	3,560,310	4,239,690	7.87%	333,664	1.6286	543,405	139,620	683,025	$ 33,149	3.40%	$ 34,276
27.	Year 27	7,800,000	3,699,930	4,100,070	7.87%	322,676	1.6286	525,510	139,620	665,130	$ 34,276	3.40%	$ 35,441
28.	Year 28	7,800,000	3,839,550	3,960,450	7.87%	311,687	1.6286	507,613	139,620	647,233	$ 35,441	3.40%	$ 36,646
29.	Year 29	7,800,000	3,979,170	3,820,830	7.87%	300,699	1.6286	489,718	139,620	629,338	$ 36,646	3.40%	$ 37,892
30.	Year 30	7,800,000	4,118,790	3,681,210	7.87%	289,711	1.6286	471,823	139,620	611,443	$ 37,892	3.40%	$ 39,181
31.	Year 31	7,800,000	4,258,410	3,541,590	7.87%	278,723	1.6286	453,928	139,620	593,548	$ 39,181	3.40%	$ 40,513
32.	Year 32	7,800,000	4,398,030	3,401,970	7.87%	267,735	1.6286	436,033	139,620	575,653	$ 40,513	3.40%	$ 41,890
33.	Year 33	7,800,000	4,537,650	3,262,350	7.87%	256,747	1.6286	418,138	139,620	557,758	$ 41,890	3.40%	$ 43,314
34.	Year 34	7,800,000	4,677,270	3,122,730	7.87%	245,759	1.6286	400,243	139,620	539,863	$ 43,314	3.40%	$ 44,787
35.	Year 35	7,800,000	4,816,890	2,983,110	7.87%	234,771	1.6286	382,348	139,620	521,968	$ 44,787	3.40%	$ 46,310
36.	Year 36	7,800,000	4,956,510	2,843,490	7.87%	223,783	1.6286	364,453	139,620	504,073	$ 46,310	3.40%	$ 47,884
37.	Year 37	7,800,000	5,096,130	2,703,870	7.87%	212,795	1.6286	346,558	139,620	486,178	$ 47,884	3.40%	$ 49,512
38.	Year 38	7,800,000	5,235,750	2,564,250	7.87%	201,806	1.6286	328,662	139,620	468,282	$ 49,512	3.40%	$ 51,196
39.	Year 39	7,800,000	5,375,370	2,424,630	7.87%	190,818	1.6286	310,766	139,620	450,386	$ 51,196	3.40%	$ 52,937
40.	Year 40	7,800,000	5,514,990	2,285,010	7.87%	179,830	1.6286	292,871	139,620	432,491	$ 52,937	3.40%	$ 54,736
41.	Year 41	7,800,000	5,654,610	2,145,390	7.87%	168,842	1.6286	274,976	139,620	414,596	$ 54,736	3.40%	$ 56,597
42.	Year 42	7,800,000	5,794,230	2,005,770	7.87%	157,854	1.6286	257,081	139,620	396,701	$ 56,597	3.40%	$ 58,512
43.	Year 43	7,800,000	5,933,850	1,866,150	7.87%	146,866	1.6286	239,186	139,620	378,806	$ 58,512	3.40%	$ 60,512
44.	Year 44	7,800,000	6,073,470	1,726,530	7.87%	135,878	1.6286	221,291	139,620	360,911	$ 60,512	3.40%	$ 62,569
45.	Year 45	7,800,000	6,213,090	1,586,910	7.87%	124,890	1.6286	203,396	139,620	343,016	$ 62,569	3.40%	$ 64,696
46.	Year 46	7,800,000	6,352,710	1,447,290	7.87%	113,902	1.6286	185,501	139,620	325,121	$ 64,696	3.40%	$ 66,896
47.	Year 47	7,800,000	6,492,330	1,307,670	7.87%	102,914	1.6286	167,606	139,620	307,226	$ 66,896	3.40%	$ 69,170
48.	Year 48	7,800,000	6,631,950	1,168,050	7.87%	91,926	1.6286	149,711	139,620	289,331	$ 69,170	3.40%	$ 71,522
49.	Year 49	7,800,000	6,771,570	1,028,430	7.87%	80,937	1.6286	131,816	139,620	271,436	$ 71,522	3.40%	$ 73,954
50.	Year 50	7,800,000	6,911,190	888,810	7.87%	69,949	1.6286	113,919	139,620	253,539	$ 73,954	3.40%	$ 76,468
51.	Year 51	7,800,000	7,050,810	749,190	7.87%	58,961	1.6286	96,024	139,620	235,644	$ 76,468	3.40%	$ 79,068
52.	Year 52	7,800,000	7,190,430	609,570	7.87%	47,973	1.6286	78,129	139,620	217,749	$ 79,068	3.40%	$ 81,757
53.	Year 53	7,800,000	7,330,050	469,950	7.87%	36,985	1.6286	60,234	139,620	199,854	$ 81,757	3.40%	$ 84,536
54.	Year 54	7,800,000	7,469,670	330,330	7.87%	25,997	1.6286	42,339	139,620	181,959	$ 84,536	3.40%	$ 87,411
55.	Year 55	7,800,000	7,609,290	190,710	7.87%	15,009	1.6286	24,444	139,620	164,064	$ 87,411	3.40%	$ 90,383
56.	Year 56	7,800,000	7,748,910	51,090	7.87%	4,021	1.6286	6,549	139,620	146,169	$ 90,383	3.40%	$ 93,456
57.	Year 57	7,800,000	7,800,000		7.87%	-	1.6286		51,090	51,090	$ 93,456	3.40%	$ 96,633
58.													
59.	Life to Date Cost and Benefit									35,725,328			1,501,766
60.													
61.													
62.	[1] Annual increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.5 Cost Benefit of Reducing Water Losses in the Rimrock Water System to 15 Percent Over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth In CPI¹	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	2,700,000	24,165	2,675,835	7.87%	210,588	1.6286	342,964	24,165	367,129	$ 5,002	3.40%	$ 5,172
2.	Year 2	2,700,000	72,495	2,627,505	7.87%	206,785	1.6286	336,770	48,330	385,100	$ 5,172	3.40%	$ 5,348
3.	Year 3	2,700,000	120,825	2,579,175	7.87%	202,981	1.6286	330,575	48,330	378,905	$ 5,348	3.40%	$ 5,530
4.	Year 4	2,700,000	169,155	2,530,845	7.87%	199,178	1.6286	324,381	48,330	372,712	$ 5,530	3.40%	$ 5,718
5.	Year 5	2,700,000	217,485	2,482,515	7.87%	195,374	1.6286	318,186	48,330	366,516	$ 5,718	3.40%	$ 5,912
6.	Year 6	2,700,000	265,815	2,434,185	7.87%	191,570	1.6286	311,991	48,330	360,321	$ 5,912	3.40%	$ 6,113
7.	Year 7	2,700,000	314,145	2,385,855	7.87%	187,767	1.6286	305,797	48,330	354,127	$ 6,113	3.40%	$ 6,322
8.	Year 8	2,700,000	362,475	2,337,525	7.87%	183,963	1.6286	299,602	48,330	347,932	$ 6,321	3.40%	$ 6,536
9.	Year 9	2,700,000	410,805	2,289,195	7.87%	180,160	1.6286	293,408	48,330	341,739	$ 6,536	3.40%	$ 6,758
10.	Year 10	2,700,000	459,135	2,240,865	7.87%	176,356	1.6286	287,213	48,330	335,543	$ 6,758	3.40%	$ 6,988
11.	Year 11	2,700,000	507,465	2,192,535	7.87%	172,553	1.6286	281,020	48,330	329,350	$ 6,988	3.40%	$ 7,226
12.	Year 12	2,700,000	555,795	2,144,205	7.87%	168,749	1.6286	274,825	48,330	323,155	$ 7,226	3.40%	$ 7,472
13.	Year 13	2,700,000	604,125	2,095,875	7.87%	164,945	1.6286	268,629	48,330	316,959	$ 7,471	3.40%	$ 7,725
14.	Year 14	2,700,000	652,455	2,047,545	7.87%	161,142	1.6286	262,436	48,330	310,766	$ 7,725	3.40%	$ 7,988
15.	Year 15	2,700,000	700,785	1,999,215	7.87%	157,338	1.6286	256,241	48,330	304,571	$ 7,988	3.40%	$ 8,259
16.	Year 16	2,700,000	749,115	1,950,885	7.87%	153,535	1.6286	250,047	48,330	298,377	$ 8,259	3.40%	$ 8,540
17.	Year 17	2,700,000	797,445	1,902,555	7.87%	149,731	1.6286	243,852	48,330	292,182	$ 8,540	3.40%	$ 8,831
18.	Year 18	2,700,000	845,775	1,854,225	7.87%	145,928	1.6286	237,658	48,330	285,988	$ 8,831	3.40%	$ 9,131
19.	Year 19	2,700,000	894,105	1,805,895	7.87%	142,124	1.6286	231,462	48,330	279,793	$ 9,131	3.40%	$ 9,441
20.	Year 20	2,700,000	942,435	1,757,565	7.87%	138,320	1.6286	225,268	48,330	273,598	$ 9,441	3.40%	$ 9,762
21.	Year 21	2,700,000	990,765	1,709,235	7.87%	134,517	1.6286	219,074	48,330	267,404	$ 9,762	3.40%	$ 10,094
22.	Year 22	2,700,000	1,039,095	1,660,905	7.87%	130,713	1.6286	212,879	48,330	261,209	$ 10,094	3.40%	$ 10,437
23.	Year 23	2,700,000	1,087,425	1,612,575	7.87%	126,920	1.6286	206,686	48,330	255,016	$ 10,437	3.40%	$ 10,792
24.	Year 24	2,700,000	1,135,755	1,564,245	7.87%	123,106	1.6286	200,490	48,330	248,820	$ 10,792	3.40%	$ 11,159
25.	Year 25	2,700,000	1,184,085	1,515,915	7.87%	119,303	1.6286	194,297	48,330	242,627	$ 11,159	3.40%	$ 11,539
26.	Year 26	2,700,000	1,232,415	1,467,585	7.87%	115,499	1.6286	188,102	48,330	236,432	$ 11,539	3.40%	$ 11,931
27.	Year 27	2,700,000	1,280,745	1,419,255	7.87%	111,695	1.6286	181,906	48,330	230,236	$ 11,931	3.40%	$ 12,327
28.	Year 28	2,700,000	1,329,075	1,370,925	7.87%	107,892	1.6286	175,713	48,330	224,042	$ 12,337	3.40%	$ 12,756
29.	Year 29	2,700,000	1,377,405	1,322,595	7.87%	104,088	1.6286	169,528	48,330	217,848	$ 12,756	3.40%	$ 13,190
30.	Year 30	2,700,000	1,425,735	1,274,265	7.87%	100,285	1.6286	163,324	48,330	211,654	$ 13,190	3.40%	$ 13,638
31.	Year 31	2,700,000	1,474,065	1,225,935	7.87%	96,481	1.6286	157,129	48,330	205,459	$ 13,638	3.40%	$ 14,102
32.	Year 32	2,700,000	1,522,395	1,177,605	7.87%	92,678	1.6286	150,925	48,330	199,265	$ 14,102	3.40%	$ 14,581
33.	Year 33	2,700,000	1,570,725	1,129,275	7.87%	88,874	1.6286	144,740	48,330	193,070	$ 14,581	3.40%	$ 15,077
34.	Year 34	2,700,000	1,619,055	1,080,945	7.87%	85,070	1.6286	138,545	48,330	186,875	$ 15,077	3.40%	$ 15,590
35.	Year 35	2,700,000	1,667,385	1,032,615	7.87%	81,267	1.6286	132,351	48,330	180,681	$ 15,590	3.40%	$ 16,120
36.	Year 36	2,700,000	1,715,715	984,285	7.87%	77,463	1.6286	126,156	48,330	174,486	$ 16,120	3.40%	$ 16,668
37.	Year 37	2,700,000	1,764,045	935,955	7.87%	73,660	1.6286	119,963	48,330	168,293	$ 16,668	3.40%	$ 17,235
38.	Year 38	2,700,000	1,812,375	887,625	7.87%	69,856	1.6286	113,767	48,330	162,097	$ 17,235	3.40%	$ 17,821
39.	Year 39	2,700,000	1,860,705	839,295	7.87%	66,053	1.6286	107,574	48,330	155,904	$ 17,821	3.40%	$ 18,427
40.	Year 40	2,700,000	1,909,035	790,965	7.87%	62,249	1.6286	101,379	48,330	149,709	$ 18,427	3.40%	$ 19,053
41.	Year 41	2,700,000	1,957,365	742,635	7.87%	58,445	1.6286	95,184	48,330	143,514	$ 19,053	3.40%	$ 19,701
42.	Year 42	2,700,000	2,005,695	694,305	7.87%	54,642	1.6286	88,990	48,330	137,320	$ 19,701	3.40%	$ 20,371
43.	Year 43	2,700,000	2,054,025	645,975	7.87%	50,838	1.6286	82,795	48,330	131,125	$ 20,371	3.40%	$ 21,063
44.	Year 44	2,700,000	2,102,355	597,645	7.87%	47,035	1.6286	76,602	48,330	124,931	$ 21,063	3.40%	$ 21,779
45.	Year 45	2,700,000	2,150,685	549,315	7.87%	43,232	1.6286	70,406	48,330	118,736	$ 21,779	3.40%	$ 22,520
46.	Year 46	2,700,000	2,199,015	500,985	7.87%	39,428	1.6286	64,212	48,330	112,542	$ 22,520	3.40%	$ 23,286
47.	Year 47	2,700,000	2,247,345	452,655	7.87%	35,624	1.6286	58,017	48,330	106,347	$ 23,286	3.40%	$ 24,077
48.	Year 48	2,700,000	2,295,675	404,325	7.87%	31,820	1.6286	51,822	48,330	100,152	$ 24,077	3.40%	$ 24,896
49.	Year 49	2,700,000	2,344,005	355,995	7.87%	28,017	1.6286	45,628	48,330	93,958	$ 24,896	3.40%	$ 25,742
50.	Year 50	2,700,000	2,392,335	307,665	7.87%	24,212	1.6286	39,433	48,330	87,763	$ 25,742	3.40%	$ 26,618
51.	Year 51	2,700,000	2,440,665	259,335	7.87%	20,410	1.6286	33,240	48,330	81,570	$ 26,618	3.40%	$ 27,523
52.	Year 52	2,700,000	2,488,995	211,005	7.87%	16,606	1.6286	27,045	48,330	75,375	$ 27,523	3.40%	$ 28,458
53.	Year 53	2,700,000	2,537,325	162,675	7.87%	12,803	1.6286	20,851	48,330	69,181	$ 28,458	3.40%	$ 29,426
54.	Year 54	2,700,000	2,585,655	114,345	7.87%	8,999	1.6286	14,656	48,330	62,986	$ 29,426	3.40%	$ 30,426
55.	Year 55	2,700,000	2,633,985	66,015	7.87%	5,195	1.6286	8,461	48,330	56,791	$ 30,426	3.40%	$ 31,461
56.	Year 56	2,700,000	2,682,315	17,685	7.87%	1,392	1.6286	2,267	48,330	50,597	$ 31,461	3.40%	$ 32,531
57	Year 57	2,700,000	2,700,000		7.87%	-	1.6286	-	17,685	17,685	$ 32,532	3.40%	$ 12,637
58.													
59.	Life to Date Cost and Benefit									12,368,464			870,832
60.													
61.													
62.	¹ Annual Increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.6 Cost Benefit of Reducing Water Losses in the Bisbee Water System to 10 Percent over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI [1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	23,500,000	210,325	23,289,675	7.87%	1,832,897	1.6286	2,985,056	210,325	3,195,381	$ 17,514	3.40%	$ 18,109
2.	Year 2	23,500,000	630,975	22,869,025	7.87%	1,799,792	1.6286	2,931,141	420,650	3,351,791	$ 18,109	3.40%	$ 18,725
3.	Year 3	23,500,000	1,051,625	22,448,375	7.87%	1,766,687	1.6286	2,877,226	420,650	3,297,876	$ 18,725	3.40%	$ 19,361
4.	Year 4	23,500,000	1,472,275	22,027,725	7.87%	1,733,582	1.6286	2,823,312	420,650	3,243,962	$ 19,361	3.40%	$ 20,020
5.	Year 5	23,500,000	1,892,925	21,607,075	7.87%	1,700,477	1.6286	2,769,397	420,650	3,190,047	$ 20,020	3.40%	$ 20,700
6.	Year 6	23,500,000	2,313,575	21,186,425	7.87%	1,667,372	1.6286	2,715,482	420,650	3,136,132	$ 20,700	3.40%	$ 21,404
7.	Year 7	23,500,000	2,734,225	20,765,775	7.87%	1,634,266	1.6286	2,661,566	420,650	3,082,216	$ 21,404	3.40%	$ 22,132
8.	Year 8	23,500,000	3,154,875	20,345,125	7.87%	1,601,161	1.6286	2,607,651	420,650	3,028,301	$ 22,132	3.40%	$ 22,884
9.	Year 9	23,500,000	3,575,525	19,924,475	7.87%	1,568,056	1.6286	2,553,736	420,650	2,974,386	$ 22,884	3.40%	$ 23,662
10.	Year 10	23,500,000	3,996,175	19,503,825	7.87%	1,534,951	1.6286	2,499,821	420,650	2,920,471	$ 23,662	3.40%	$ 24,467
11.	Year 11	23,500,000	4,416,825	19,083,175	7.87%	1,501,846	1.6286	2,445,906	420,650	2,866,556	$ 24,467	3.40%	$ 25,299
12.	Year 12	23,500,000	4,837,475	18,662,525	7.87%	1,468,741	1.6286	2,391,992	420,650	2,812,642	$ 25,299	3.40%	$ 26,159
13.	Year 13	23,500,000	5,258,125	18,241,875	7.87%	1,435,636	1.6286	2,338,077	420,650	2,758,727	$ 26,159	3.40%	$ 27,048
14.	Year 14	23,500,000	5,678,775	17,821,225	7.87%	1,402,530	1.6286	2,284,160	420,650	2,704,810	$ 27,048	3.40%	$ 27,968
15.	Year 15	23,500,000	6,099,425	17,400,575	7.87%	1,369,425	1.6286	2,230,246	420,650	2,650,896	$ 27,968	3.40%	$ 28,919
16.	Year 16	23,500,000	6,520,075	16,979,925	7.87%	1,336,320	1.6286	2,176,331	420,650	2,596,981	$ 28,919	3.40%	$ 29,902
17.	Year 17	23,500,000	6,940,725	16,559,275	7.87%	1,303,215	1.6286	2,122,416	420,650	2,543,066	$ 29,902	3.40%	$ 30,919
18.	Year 18	23,500,000	7,361,375	16,138,625	7.87%	1,270,110	1.6286	2,068,501	420,650	2,489,151	$ 30,919	3.40%	$ 31,970
19.	Year 19	23,500,000	7,782,025	15,717,975	7.87%	1,237,005	1.6286	2,014,586	420,650	2,435,236	$ 31,970	3.40%	$ 33,057
20.	Year 20	23,500,000	8,202,675	15,297,325	7.87%	1,203,899	1.6286	1,960,670	420,650	2,381,320	$ 33,057	3.40%	$ 34,181
21.	Year 21	23,500,000	8,623,325	14,876,675	7.87%	1,170,794	1.6286	1,906,755	420,650	2,327,405	$ 34,181	3.40%	$ 35,343
22.	Year 22	23,500,000	9,043,975	14,456,025	7.87%	1,137,689	1.6286	1,852,840	420,650	2,273,490	$ 35,343	3.40%	$ 36,545
23.	Year 23	23,500,000	9,464,625	14,035,375	7.87%	1,104,584	1.6286	1,798,926	420,650	2,219,576	$ 36,545	3.40%	$ 37,787
24.	Year 24	23,500,000	9,885,275	13,614,725	7.87%	1,071,479	1.6286	1,745,011	420,650	2,165,661	$ 37,787	3.40%	$ 39,072
25.	Year 25	23,500,000	10,305,925	13,194,075	7.87%	1,038,374	1.6286	1,691,096	420,650	2,111,746	$ 39,072	3.40%	$ 40,400
26.	Year 26	23,500,000	10,726,575	12,773,425	7.87%	1,005,269	1.6286	1,637,181	420,650	2,057,831	$ 40,400	3.40%	$ 41,774
27.	Year 17	23,500,000	11,147,225	12,352,775	7.87%	972,163	1.6286	1,583,265	420,650	2,003,915	$ 41,774	3.40%	$ 43,194
28.	Year 28	23,500,000	11,567,875	11,932,125	7.87%	939,058	1.6286	1,529,350	420,650	1,950,000	$ 43,194	3.40%	$ 44,663
29.	Year 29	23,500,000	11,988,525	11,511,475	7.87%	905,953	1.6286	1,475,435	420,650	1,896,085	$ 44,663	3.40%	$ 46,182
30.	Year 30	23,500,000	12,409,175	11,090,825	7.87%	872,848	1.6286	1,421,520	420,650	1,842,170	$ 46,182	3.40%	$ 47,752
31.	Year 31	23,500,000	12,829,825	10,670,175	7.87%	839,743	1.6286	1,367,605	420,650	1,788,255	$ 47,752	3.40%	$ 49,375
32.	Year 32	23,500,000	13,250,475	10,249,525	7.87%	806,638	1.6286	1,313,691	420,650	1,734,341	$ 49,375	3.40%	$ 51,054
33.	Year 33	23,500,000	13,671,125	9,828,875	7.87%	773,532	1.6286	1,259,774	420,650	1,680,424	$ 51,054	3.40%	$ 52,790
34.	Year 34	23,500,000	14,091,775	9,408,225	7.87%	740,427	1.6286	1,205,859	420,650	1,626,509	$ 52,790	3.40%	$ 54,585
35.	Year 35	23,500,000	14,512,425	8,987,575	7.87%	707,322	1.6286	1,151,945	420,650	1,572,595	$ 54,585	3.40%	$ 56,441
36.	Year 36	23,500,000	14,933,075	8,566,925	7.87%	674,217	1.6286	1,098,030	420,650	1,518,680	$ 56,441	3.40%	$ 58,360
37.	Year 37	23,500,000	15,353,725	8,146,275	7.87%	641,112	1.6286	1,044,115	420,650	1,464,765	$ 58,360	3.40%	$ 60,344
38.	Year 38	23,500,000	15,774,375	7,725,625	7.87%	608,007	1.6286	990,200	420,650	1,410,850	$ 60,344	3.40%	$ 62,396
39.	Year 39	23,500,000	16,195,025	7,304,975	7.87%	574,902	1.6286	936,285	420,650	1,356,935	$ 62,396	3.40%	$ 64,517
40.	Year 40	23,500,000	16,615,675	6,884,325	7.87%	541,796	1.6286	882,369	420,650	1,303,019	$ 64,517	3.40%	$ 66,711
41.	Year 41	23,500,000	17,036,325	6,463,675	7.87%	508,691	1.6286	828,454	420,650	1,249,104	$ 66,711	3.40%	$ 68,979
42.	Year 42	23,500,000	17,456,975	6,043,025	7.87%	475,586	1.6286	774,539	420,650	1,195,189	$ 68,979	3.40%	$ 71,324
43.	Year 43	23,500,000	17,877,625	5,622,375	7.87%	442,481	1.6286	720,625	420,650	1,141,275	$ 71,324	3.40%	$ 73,749
44.	Year 44	23,500,000	18,298,275	5,201,725	7.87%	409,376	1.6286	666,710	420,650	1,087,360	$ 73,749	3.40%	$ 76,257
45.	Year 45	23,500,000	18,718,925	4,781,075	7.87%	376,271	1.6286	612,795	420,650	1,033,445	$ 76,257	3.40%	$ 78,849
46.	Year 46	23,500,000	19,139,575	4,360,425	7.87%	343,165	1.6286	558,879	420,650	979,529	$ 78,849	3.40%	$ 81,530
47	Year 47	23,500,000	19,560,225	3,939,775	7.87%	310,060	1.6286	504,964	420,650	925,614	$ 81,530	3.40%	$ 84,302
48.	Year 48	23,500,000	19,980,875	3,519,125	7.87%	276,955	1.6286	451,049	420,650	871,699	$ 84,302	3.40%	$ 87,168
49.	Year 49	23,500,000	20,401,525	3,098,475	7.87%	243,850	1.6286	397,134	420,650	817,784	$ 87,168	3.40%	$ 90,132
50.	Year 50	23,500,000	20,822,175	2,677,825	7.87%	210,745	1.6286	343,219	420,650	763,869	$ 90,132	3.40%	$ 93,197
51	Year 51	23,500,000	21,242,825	2,257,175	7.87%	177,640	1.6286	289,305	420,650	709,955	$ 93,197	3.40%	$ 96,365
52	Year 52	23,500,000	21,663,475	1,836,525	7.87%	144,535	1.6286	235,390	420,650	656,040	$ 96,365	3.40%	$ 99,642
53.	Year 53	23,500,000	22,084,125	1,415,875	7.87%	111,429	1.6286	181,473	420,650	602,123	$ 99,642	3.40%	$ 103,030
54.	Year 54	23,500,000	22,504,775	995,225	7.87%	78,324	1.6286	127,558	420,650	548,208	$ 103,030	3.40%	$ 106,533
55.	Year 55	23,500,000	22,925,425	574,575	7.87%	45,219	1.6286	73,644	420,650	494,294	$ 106,533	3.40%	$ 110,155
56.	Year 56	23,500,000	23,346,075	153,925	7.87%	12,114	1.6286	19,729	420,650	440,379	$ 110,155	3.40%	$ 113,900
57	Year 57	23,500,000	23,500,000	-	7.87%	-	1.6286	-	153,925	153,925	$ 113,900	3.40%	$ 117,773
58.													
59.	Life to Date Cost and Benefit									107,633,991			3,049,056
60.													
61.													
62.	[1] Annual increse in CPI based on November, 2011 data.												
63.													
64.													

12.2.7 Cost Benefit of Reducing Water Losses in the Bisbee Water System to 15 Percent Over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI[1]	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	3,300,000	29,535	3,270,465	7.87%	257,386	1.6286	419,179	29,535	448,714	$ 2,495	3.40%	$ 2,580
2.	Year 2	3,300,000	88,605	3,211,395	7.87%	252,737	1.6286	411,607	59,070	470,677	$ 2,580	3.40%	$ 2,668
3.	Year 3	3,300,000	147,675	3,152,325	7.87%	248,088	1.6286	404,036	59,070	463,106	$ 2,668	3.40%	$ 2,758
4.	Year 4	3,300,000	206,745	3,093,255	7.87%	243,439	1.6286	396,465	59,070	455,535	$ 2,758	3.40%	$ 2,852
5.	Year 5	3,300,000	265,815	3,034,185	7.87%	238,790	1.6286	388,893	59,070	447,963	$ 2,852	3.40%	$ 2,949
6.	Year 6	3,300,000	324,885	2,975,115	7.87%	234,142	1.6286	381,324	59,070	440,394	$ 2,949	3.40%	$ 3,049
7.	Year 7	3,300,000	383,955	2,916,045	7.87%	229,493	1.6286	373,751	59,070	432,822	$ 3,049	3.40%	$ 3,153
8.	Year 8	3,300,000	443,025	2,856,975	7.87%	224,844	1.6286	366,182	59,070	425,252	$ 3,153	3.40%	$ 3,260
9.	Year 9	3,300,000	502,095	2,797,905	7.87%	220,195	1.6286	358,610	59,070	417,680	$ 3,260	3.40%	$ 3,371
10.	Year 10	3,300,000	561,165	2,738,835	7.87%	215,546	1.6286	351,038	59,070	410,108	$ 3,371	3.40%	$ 3,486
11.	Year 11	3,300,000	620,235	2,679,765	7.87%	210,898	1.6286	343,468	59,070	402,538	$ 3,486	3.40%	$ 3,604
12.	Year 12	3,300,000	679,305	2,620,695	7.87%	206,249	1.6286	335,897	59,070	394,967	$ 3,604	3.40%	$ 3,727
13.	Year 13	3,300,000	738,375	2,561,625	7.87%	201,600	1.6286	328,326	59,070	387,396	$ 3,727	3.40%	$ 3,854
14.	Year 14	3,300,000	797,445	2,502,555	7.87%	196,952	1.6286	320,754	59,070	379,824	$ 3,854	3.40%	$ 3,985
15.	Year 15	3,300,000	856,515	2,443,485	7.87%	192,302	1.6286	313,183	59,070	372,253	$ 3,985	3.40%	$ 4,120
16.	Year 16	3,300,000	915,585	2,384,415	7.87%	187,653	1.6286	305,612	59,070	364,682	$ 4,120	3.40%	$ 4,260
17.	Year 17	3,300,000	974,655	2,325,345	7.87%	183,005	1.6286	298,042	59,070	357,112	$ 4,260	3.40%	$ 4,405
18.	Year 18	3,300,000	1,033,725	2,266,275	7.87%	178,356	1.6286	290,471	59,070	349,541	$ 4,405	3.40%	$ 4,555
19.	Year 19	3,300,000	1,092,795	2,207,205	7.87%	173,707	1.6286	282,899	59,070	341,969	$ 4,555	3.40%	$ 4,710
20.	Year 20	3,300,000	1,151,865	2,148,135	7.87%	169,058	1.6286	275,328	59,070	334,398	$ 4,710	3.40%	$ 4,870
21.	Year 21	3,300,000	1,210,935	2,089,065	7.87%	164,409	1.6286	267,756	59,070	326,826	$ 4,870	3.40%	$ 5,035
22.	Year 22	3,300,000	1,270,005	2,029,995	7.87%	159,762	1.6286	260,187	59,070	319,257	$ 5,035	3.40%	$ 5,206
23.	Year 23	3,300,000	1,329,075	1,970,925	7.87%	155,112	1.6286	252,615	59,070	311,685	$ 5,206	3.40%	$ 5,383
24.	Year 24	3,300,000	1,388,145	1,911,855	7.87%	150,463	1.6286	245,044	59,070	304,114	$ 5,383	3.40%	$ 5,567
25.	Year 25	3,300,000	1,447,215	1,852,785	7.87%	145,814	1.6286	237,473	59,070	296,543	$ 5,567	3.40%	$ 5,756
26.	Year 26	3,300,000	1,506,285	1,793,715	7.87%	141,165	1.6286	229,901	59,070	288,971	$ 5,756	3.40%	$ 5,951
27.	Year 27	3,300,000	1,565,355	1,734,645	7.87%	136,517	1.6286	222,332	59,070	281,402	$ 5,952	3.40%	$ 6,154
28.	Year 28	3,300,000	1,624,425	1,675,575	7.87%	131,868	1.6286	214,760	59,070	273,830	$ 6,154	3.40%	$ 6,363
29.	Year 29	3,300,000	1,683,495	1,616,505	7.87%	127,219	1.6286	207,189	59,070	266,259	$ 6,363	3.40%	$ 6,579
30.	Year 30	3,300,000	1,742,565	1,557,435	7.87%	122,570	1.6286	199,618	59,070	258,688	$ 6,579	3.40%	$ 6,803
31.	Year 31	3,300,000	1,801,635	1,498,365	7.87%	117,921	1.6286	192,046	59,070	251,116	$ 6,803	3.40%	$ 7,034
32.	Year 32	3,300,000	1,860,705	1,439,295	7.87%	113,273	1.6286	184,476	59,070	243,546	$ 7,034	3.40%	$ 7,274
33.	Year 33	3,300,000	1,919,775	1,380,225	7.87%	108,624	1.6286	176,905	59,070	235,975	$ 7,274	3.40%	$ 7,522
34.	Year 34	3,300,000	1,978,845	1,321,155	7.87%	103,975	1.6286	169,334	59,070	228,404	$ 7,522	3.40%	$ 7,777
35.	Year 35	3,300,000	2,037,915	1,262,085	7.87%	99,326	1.6286	161,762	59,070	220,832	$ 7,777	3.40%	$ 8,041
36.	Year 36	3,300,000	2,096,985	1,203,015	7.87%	94,677	1.6286	154,191	59,070	213,261	$ 8,042	3.40%	$ 8,324
37.	Year 37	3,300,000	2,156,055	1,143,945	7.87%	90,028	1.6286	146,620	59,070	205,690	$ 8,324	3.40%	$ 8,597
38.	Year 38	3,300,000	2,215,125	1,084,875	7.87%	85,380	1.6286	139,050	59,070	198,120	$ 8,597	3.40%	$ 8,889
39.	Year 39	3,300,000	2,274,195	1,025,805	7.87%	80,731	1.6286	131,479	59,070	190,549	$ 8,889	3.40%	$ 9,192
40.	Year 40	3,300,000	2,333,265	966,735	7.87%	76,082	1.6286	123,907	59,070	182,977	$ 9,192	3.40%	$ 9,504
41.	Year 41	3,300,000	2,392,335	907,665	7.87%	71,433	1.6286	116,336	59,070	175,406	$ 9,504	3.40%	$ 9,827
42.	Year 42	3,300,000	2,451,405	848,595	7.87%	66,784	1.6286	108,764	59,070	167,834	$ 9,827	3.40%	$ 10,161
43.	Year 43	3,300,000	2,510,475	789,525	7.87%	62,136	1.6286	101,195	59,070	160,265	$ 10,162	3.40%	$ 10,507
44.	Year 44	3,300,000	2,569,545	730,455	7.87%	57,487	1.6286	93,623	59,070	152,693	$ 10,507	3.40%	$ 10,864
45.	Year 45	3,300,000	2,628,615	671,385	7.87%	52,838	1.6286	86,052	59,070	145,122	$ 10,864	3.40%	$ 11,233
46.	Year 46	3,300,000	2,687,685	612,315	7.87%	48,189	1.6286	78,481	59,070	137,551	$ 11,233	3.40%	$ 11,615
47.	Year 47	3,300,000	2,746,755	553,245	7.87%	43,540	1.6286	70,909	59,070	129,979	$ 11,615	3.40%	$ 12,010
48.	Year 48	3,300,000	2,805,825	494,175	7.87%	38,892	1.6286	63,340	59,070	122,410	$ 12,020	3.40%	$ 12,419
49.	Year 49	3,300,000	2,864,895	435,105	7.87%	34,243	1.6286	55,768	59,070	114,838	$ 12,419	3.40%	$ 12,842
50.	Year 50	3,300,000	2,923,965	376,035	7.87%	29,594	1.6286	48,197	59,070	107,267	$ 12,841	3.40%	$ 13,278
51.	Year 51	3,300,000	2,983,035	316,965	7.87%	24,945	1.6286	40,625	59,070	99,695	$ 13,278	3.40%	$ 13,719
52.	Year 52	3,300,000	3,042,105	257,895	7.87%	20,296	1.6286	33,054	59,070	92,124	$ 13,729	3.40%	$ 14,196
53.	Year 53	3,300,000	3,101,175	198,825	7.87%	15,648	1.6286	25,484	59,070	84,554	$ 14,196	3.40%	$ 14,678
54.	Year 54	3,300,000	3,160,245	139,755	7.87%	10,999	1.6286	17,913	59,070	76,983	$ 14,678	3.40%	$ 15,177
55.	Year 55	3,300,000	3,219,315	80,685	7.87%	6,350	1.6286	10,342	59,070	69,412	$ 15,177	3.40%	$ 15,693
56.	Year 56	3,300,000	3,278,385	21,615	7.87%	1,701	1.6286	2,770	59,070	61,840	$ 15,693	3.40%	$ 16,227
57.	Year 57	3,300,000	3,300,000	-	7.87%	-	1.6286	-	21,615	21,615	$ 16,227	3.40%	$ 16,779
58.													
59.	Life to Date Cost and Benefit									15,124,563			434,390
60.													
61.													
62.	[1] Annual increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.8 Cost Benefit of Reducing Water Losses in the Pinewood Water System to 10 Percent over Life of Infrastructure Replacement

Line No.	Year	Plant in Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI *	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	17,500,000	156,625	17,343,375	7.87%	1,364,924	1.6286	2,222,915	156,625	2,379,540	$ 26,162	3.40%	$ 27,051
2.	Year 2	17,500,000	469,875	17,030,125	7.87%	1,340,271	1.6286	2,182,765	313,250	2,496,015	$ 27,051	3.40%	$ 27,971
3.	Year 3	17,500,000	783,125	16,716,875	7.87%	1,315,618	1.6286	2,142,615	313,250	2,455,865	$ 27,971	3.40%	$ 28,922
4.	Year 4	17,500,000	1,096,375	16,403,625	7.87%	1,290,965	1.6286	2,102,466	313,250	2,415,716	$ 28,922	3.40%	$ 29,906
5.	Year 5	17,500,000	1,409,625	16,090,375	7.87%	1,266,313	1.6286	2,062,317	313,250	2,375,567	$ 29,906	3.40%	$ 30,922
6.	Year 6	17,500,000	1,722,875	15,777,125	7.87%	1,241,660	1.6286	2,022,167	313,250	2,335,417	$ 30,922	3.40%	$ 31,974
7.	Year 7	17,500,000	2,036,125	15,463,875	7.87%	1,217,007	1.6286	1,982,018	313,250	2,295,268	$ 31,974	3.40%	$ 33,061
8.	Year 8	17,500,000	2,349,375	15,150,625	7.87%	1,192,354	1.6286	1,941,868	313,250	2,255,118	$ 33,061	3.40%	$ 34,185
9.	Year 9	17,500,000	2,662,625	14,837,375	7.87%	1,167,702	1.6286	1,901,718	313,250	2,214,968	$ 34,185	3.40%	$ 35,347
10.	Year 10	17,500,000	2,975,875	14,524,125	7.87%	1,143,049	1.6286	1,861,570	313,250	2,174,820	$ 35,347	3.40%	$ 36,549
11.	Year 11	17,500,000	3,289,125	14,210,875	7.87%	1,118,396	1.6286	1,821,420	313,250	2,134,670	$ 36,549	3.40%	$ 37,791
12.	Year 12	17,500,000	3,602,375	13,897,625	7.87%	1,093,743	1.6286	1,781,270	313,250	2,094,520	$ 37,791	3.40%	$ 39,076
13.	Year 13	17,500,000	3,915,625	13,584,375	7.87%	1,069,090	1.6286	1,741,120	313,250	2,054,370	$ 39,076	3.40%	$ 40,405
14.	Year 14	17,500,000	4,228,875	13,271,125	7.87%	1,044,438	1.6286	1,700,971	313,250	2,014,221	$ 40,405	3.40%	$ 41,779
15.	Year 15	17,500,000	4,542,125	12,957,875	7.87%	1,019,785	1.6286	1,660,821	313,250	1,974,071	$ 41,779	3.40%	$ 43,199
16.	Year 16	17,500,000	4,855,375	12,644,625	7.87%	995,132	1.6286	1,620,672	313,250	1,933,922	$ 43,199	3.40%	$ 44,668
17.	Year 17	17,500,000	5,168,625	12,331,375	7.87%	970,479	1.6286	1,580,522	313,250	1,893,772	$ 44,668	3.40%	$ 46,187
18.	Year 18	17,500,000	5,481,875	12,018,125	7.87%	945,826	1.6286	1,540,372	313,250	1,853,622	$ 46,187	3.40%	$ 47,757
19.	Year 19	17,500,000	5,795,125	11,704,875	7.87%	921,174	1.6286	1,500,224	313,250	1,813,474	$ 47,757	3.40%	$ 49,381
20.	Year 20	17,500,000	6,108,375	11,391,625	7.87%	896,521	1.6286	1,460,074	313,250	1,773,324	$ 49,381	3.40%	$ 51,060
21.	Year 21	17,500,000	6,421,625	11,078,375	7.87%	871,868	1.6286	1,419,924	313,250	1,733,174	$ 51,060	3.40%	$ 52,796
22.	Year 22	17,500,000	6,734,875	10,765,125	7.87%	847,215	1.6286	1,379,774	313,250	1,693,024	$ 52,796	3.40%	$ 54,591
23.	Year 23	17,500,000	7,048,125	10,451,875	7.87%	822,563	1.6286	1,339,626	313,250	1,652,876	$ 54,591	3.40%	$ 56,447
24.	Year 24	17,500,000	7,361,375	10,138,625	7.87%	797,910	1.6286	1,299,476	313,250	1,612,726	$ 56,447	3.40%	$ 58,366
25.	Year 25	17,500,000	7,674,625	9,825,375	7.87%	773,257	1.6286	1,259,326	313,250	1,572,576	$ 58,366	3.40%	$ 60,350
26.	Year 26	17,500,000	7,987,875	9,512,125	7.87%	748,604	1.6286	1,219,176	313,250	1,532,426	$ 60,350	3.40%	$ 62,402
27.	Year 27	17,500,000	8,301,125	9,198,875	7.87%	723,951	1.6286	1,179,027	313,250	1,492,277	$ 62,402	3.40%	$ 64,524
28.	Year 28	17,500,000	8,614,375	8,885,625	7.87%	699,299	1.6286	1,138,878	313,250	1,452,128	$ 64,524	3.40%	$ 66,718
29.	Year 29	17,500,000	8,927,625	8,572,375	7.87%	674,646	1.6286	1,098,728	313,250	1,411,978	$ 66,718	3.40%	$ 68,986
30.	Year 30	17,500,000	9,240,875	8,259,125	7.87%	649,993	1.6286	1,058,579	313,250	1,371,829	$ 68,986	3.40%	$ 71,332
31.	Year 31	17,500,000	9,554,125	7,945,875	7.87%	625,340	1.6286	1,018,429	313,250	1,331,679	$ 71,332	3.40%	$ 73,757
32.	Year 32	17,500,000	9,867,375	7,632,625	7.87%	600,688	1.6286	978,280	313,250	1,291,530	$ 73,757	3.40%	$ 76,265
33.	Year 33	17,500,000	10,180,625	7,319,375	7.87%	576,035	1.6286	938,131	313,250	1,251,381	$ 76,265	3.40%	$ 78,858
34.	Year 34	17,500,000	10,493,875	7,006,125	7.87%	551,382	1.6286	897,981	313,250	1,211,231	$ 78,858	3.40%	$ 81,539
35.	Year 35	17,500,000	10,807,125	6,692,875	7.87%	526,729	1.6286	857,831	313,250	1,171,081	$ 81,539	3.40%	$ 84,311
36.	Year 36	17,500,000	11,120,375	6,379,625	7.87%	502,076	1.6286	817,681	313,250	1,130,931	$ 84,311	3.40%	$ 87,178
37.	Year 37	17,500,000	11,433,625	6,066,375	7.87%	477,424	1.6286	777,533	313,250	1,090,783	$ 87,178	3.40%	$ 90,142
38.	Year 38	17,500,000	11,746,875	5,753,125	7.87%	452,771	1.6286	737,383	313,250	1,050,633	$ 90,142	3.40%	$ 93,207
39.	Year 39	17,500,000	12,060,125	5,439,875	7.87%	428,118	1.6286	697,233	313,250	1,010,483	$ 93,207	3.40%	$ 96,376
40.	Year 40	17,500,000	12,373,375	5,126,625	7.87%	403,465	1.6286	657,083	313,250	970,333	$ 96,376	3.40%	$ 99,653
41.	Year 41	17,500,000	12,686,625	4,813,375	7.87%	378,813	1.6286	616,935	313,250	930,185	$ 99,653	3.40%	$ 103,041
42.	Year 42	17,500,000	12,999,875	4,500,125	7.87%	354,160	1.6286	576,785	313,250	890,035	$ 103,041	3.40%	$ 106,544
43.	Year 43	17,500,000	13,313,125	4,186,875	7.87%	329,507	1.6286	536,635	313,250	849,885	$ 106,544	3.40%	$ 110,167
44.	Year 44	17,500,000	13,626,375	3,873,625	7.87%	304,854	1.6286	496,485	313,250	809,735	$ 110,167	3.40%	$ 113,912
45.	Year 45	17,500,000	13,939,625	3,560,375	7.87%	280,202	1.6286	456,337	313,250	769,587	$ 113,912	3.40%	$ 117,785
46.	Year 46	17,500,000	14,252,875	3,247,125	7.87%	255,549	1.6286	416,187	313,250	729,437	$ 117,785	3.40%	$ 121,790
47.	Year 47	17,500,000	14,566,125	2,933,875	7.87%	230,896	1.6286	376,037	313,250	689,287	$ 121,790	3.40%	$ 125,931
48.	Year 48	17,500,000	14,879,375	2,620,625	7.87%	206,243	1.6286	335,887	313,250	649,137	$ 125,931	3.40%	$ 130,213
49.	Year 49	17,500,000	15,192,625	2,307,375	7.87%	181,590	1.6286	295,737	313,250	608,987	$ 130,213	3.40%	$ 134,640
50.	Year 50	17,500,000	15,505,875	1,994,125	7.87%	156,938	1.6286	255,589	313,250	568,839	$ 134,640	3.40%	$ 139,218
51.	Year 51	17,500,000	15,819,125	1,680,875	7.87%	132,285	1.6286	215,439	313,250	528,689	$ 139,218	3.40%	$ 143,951
52.	Year 52	17,500,000	16,132,375	1,367,625	7.87%	107,632	1.6286	175,289	313,250	488,539	$ 143,951	3.40%	$ 148,845
53.	Year 53	17,500,000	16,445,625	1,054,375	7.87%	82,979	1.6286	135,140	313,250	448,390	$ 148,845	3.40%	$ 153,906
54.	Year 54	17,500,000	16,758,875	741,125	7.87%	58,327	1.6286	94,992	313,250	408,241	$ 153,906	3.40%	$ 159,139
55.	Year 55	17,500,000	17,072,125	427,875	7.87%	33,674	1.6286	54,842	313,250	368,092	$ 159,139	3.40%	$ 164,550
56.	Year 56	17,500,000	17,385,375	114,625	7.87%	9,021	1.6286	14,692	313,250	327,942	$ 164,550	3.40%	$ 170,144
57.	Year 57	17,500,000	17,500,000	-	7.87%	-	1.6286	-	114,625	114,625	$ 170,144	3.40%	$ 175,929
58.													
59.	Life to Date Cost and Benefit									80,152,975			4,554,693
60.													
61.													
62.	* Annual increase in CPI based on November, 2011 data.												
63.													
64.													

12.2.9 Cost Benefit of Reducing Water Losses in the Pinewood Water System to 15 Percent Over Life of Infrastructure Replacement

Line No.	Year	Plant In Service	Accumulated Depreciation	Net Utility Plant	Return on Rate Base	Required Operating Income	Tax Multiplier	Revenue Required Return on Investment	Depreciation Expense	Annual Revenue Requirement	Annual Cost Savings	Growth in CPI *	Inflation Adjusted Savings
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1.	Year 1	12,900,000	115,455	12,784,545	7.87%	1,006,144	1.6286	1,638,606	115,455	1,754,061	$ 19,260	3.40%	$ 19,915
2.	Year 2	12,900,000	346,365	12,553,635	7.87%	987,971	1.6286	1,608,010	230,910	1,838,920	$ 19,915	3.40%	$ 20,592
3.	Year 3	12,900,000	577,275	12,322,725	7.87%	969,798	1.6286	1,579,413	230,910	1,810,323	$ 20,592	3.40%	$ 21,292
4.	Year 4	12,900,000	808,185	12,091,815	7.87%	951,626	1.6286	1,549,818	230,910	1,780,728	$ 21,292	3.40%	$ 22,016
5.	Year 5	12,900,000	1,039,095	11,860,905	7.87%	933,453	1.6286	1,520,222	230,910	1,751,132	$ 22,016	3.40%	$ 22,765
6.	Year 6	12,900,000	1,270,005	11,629,995	7.87%	915,281	1.6286	1,490,627	230,910	1,721,537	$ 22,765	3.40%	$ 23,539
7.	Year 7	12,900,000	1,500,915	11,399,085	7.87%	897,108	1.6286	1,461,030	230,910	1,691,940	$ 23,539	3.40%	$ 24,339
8.	Year 8	12,900,000	1,731,825	11,168,175	7.87%	878,935	1.6286	1,431,434	230,910	1,662,344	$ 24,339	3.40%	$ 25,167
9.	Year 9	12,900,000	1,962,735	10,937,265	7.87%	860,763	1.6286	1,401,839	230,910	1,632,749	$ 25,167	3.40%	$ 26,022
10.	Year 10	12,900,000	2,193,645	10,706,355	7.87%	842,590	1.6286	1,372,242	230,910	1,603,152	$ 26,022	3.40%	$ 26,907
11.	Year 11	12,900,000	2,424,555	10,475,445	7.87%	824,418	1.6286	1,342,647	230,910	1,573,557	$ 26,907	3.40%	$ 27,822
12.	Year 12	12,900,000	2,655,465	10,244,535	7.87%	806,245	1.6286	1,313,051	230,910	1,543,961	$ 27,822	3.40%	$ 28,768
13.	Year 13	12,900,000	2,886,375	10,013,625	7.87%	788,072	1.6286	1,283,454	230,910	1,514,364	$ 28,768	3.40%	$ 29,746
14.	Year 14	12,900,000	3,117,285	9,782,715	7.87%	769,900	1.6286	1,253,859	230,910	1,484,769	$ 29,746	3.40%	$ 30,757
15.	Year 15	12,900,000	3,348,195	9,551,805	7.87%	751,727	1.6286	1,224,263	230,910	1,455,173	$ 30,757	3.40%	$ 31,803
16.	Year 16	12,900,000	3,579,105	9,320,895	7.87%	733,554	1.6286	1,194,668	230,910	1,425,576	$ 31,803	3.40%	$ 32,884
17.	Year 17	12,900,000	3,810,015	9,089,985	7.87%	715,382	1.6286	1,165,071	230,910	1,395,982	$ 32,884	3.40%	$ 34,002
18.	Year 18	12,900,000	4,040,925	8,859,075	7.87%	697,209	1.6286	1,135,475	230,910	1,366,385	$ 34,002	3.40%	$ 35,158
19.	Year 19	12,900,000	4,271,835	8,628,165	7.87%	679,037	1.6286	1,105,880	230,910	1,336,790	$ 35,158	3.40%	$ 36,354
20.	Year 20	12,900,000	4,502,745	8,397,255	7.87%	660,864	1.6286	1,076,283	230,910	1,307,193	$ 36,354	3.40%	$ 37,590
21.	Year 21	12,900,000	4,733,655	8,166,345	7.87%	642,691	1.6286	1,046,687	230,910	1,277,597	$ 37,590	3.40%	$ 38,868
22.	Year 22	12,900,000	4,964,565	7,935,435	7.87%	624,519	1.6286	1,017,091	230,910	1,248,002	$ 38,868	3.40%	$ 40,189
23.	Year 23	12,900,000	5,195,475	7,704,525	7.87%	606,346	1.6286	987,495	230,910	1,218,405	$ 40,189	3.40%	$ 41,556
24.	Year 24	12,900,000	5,426,385	7,473,615	7.87%	588,174	1.6286	957,900	230,910	1,188,810	$ 41,556	3.40%	$ 42,969
25.	Year 25	12,900,000	5,657,295	7,242,705	7.87%	570,002	1.6286	928,304	230,910	1,159,214	$ 42,969	3.40%	$ 44,430
26.	Year 26	12,900,000	5,888,205	7,011,795	7.87%	551,828	1.6286	898,709	230,910	1,129,617	$ 44,430	3.40%	$ 45,940
27.	Year 27	12,900,000	6,119,115	6,780,885	7.87%	533,656	1.6286	869,111	230,910	1,100,021	$ 45,940	3.40%	$ 47,502
28.	Year 28	12,900,000	6,350,025	6,549,975	7.87%	515,483	1.6286	839,516	230,910	1,070,426	$ 47,502	3.40%	$ 49,117
29.	Year 29	12,900,000	6,580,935	6,319,065	7.87%	497,320	1.6286	809,919	230,910	1,040,829	$ 49,117	3.40%	$ 50,787
30.	Year 30	12,900,000	6,811,845	6,088,155	7.87%	479,138	1.6286	780,324	230,910	1,011,234	$ 50,787	3.40%	$ 52,514
31.	Year 31	12,900,000	7,042,755	5,857,245	7.87%	460,965	1.6286	750,728	230,910	981,638	$ 52,514	3.40%	$ 54,300
32.	Year 32	12,900,000	7,273,665	5,626,335	7.87%	442,793	1.6286	721,133	230,910	952,043	$ 54,300	3.40%	$ 56,146
33.	Year 33	12,900,000	7,504,575	5,395,425	7.87%	424,620	1.6286	691,536	230,910	922,446	$ 56,146	3.40%	$ 58,055
34.	Year 34	12,900,000	7,735,485	5,164,515	7.87%	406,447	1.6286	661,940	230,910	892,850	$ 58,055	3.40%	$ 60,029
35.	Year 35	12,900,000	7,966,395	4,933,605	7.87%	388,275	1.6286	632,345	230,910	863,255	$ 60,029	3.40%	$ 62,069
36.	Year 36	12,900,000	8,197,305	4,702,695	7.87%	370,102	1.6286	602,748	230,910	833,658	$ 62,069	3.40%	$ 64,180
37.	Year 37	12,900,000	8,428,215	4,471,785	7.87%	351,929	1.6286	573,152	230,910	804,062	$ 64,180	3.40%	$ 66,362
38.	Year 38	12,900,000	8,659,125	4,240,875	7.87%	333,757	1.6286	543,557	230,910	774,467	$ 66,362	3.40%	$ 68,618
39.	Year 39	12,900,000	8,890,035	4,009,965	7.87%	315,584	1.6286	513,960	230,910	744,870	$ 68,618	3.40%	$ 70,951
40.	Year 40	12,900,000	9,120,945	3,779,055	7.87%	297,412	1.6286	484,365	230,910	715,275	$ 70,951	3.40%	$ 73,364
41.	Year 41	12,900,000	9,351,855	3,548,145	7.87%	279,239	1.6286	454,769	230,910	685,679	$ 73,364	3.40%	$ 75,858
42.	Year 42	12,900,000	9,582,765	3,317,235	7.87%	261,066	1.6286	425,172	230,910	656,082	$ 75,858	3.40%	$ 78,437
43.	Year 43	12,900,000	9,813,675	3,086,325	7.87%	242,894	1.6286	395,577	230,910	626,487	$ 78,437	3.40%	$ 81,104
44.	Year 44	12,900,000	10,044,585	2,855,415	7.87%	224,721	1.6286	365,981	230,910	596,891	$ 81,104	3.40%	$ 83,862
45.	Year 45	12,900,000	10,275,495	2,624,505	7.87%	206,549	1.6286	336,386	230,910	567,296	$ 83,862	3.40%	$ 86,713
46.	Year 46	12,900,000	10,506,405	2,393,595	7.87%	188,376	1.6286	306,789	230,910	537,699	$ 86,713	3.40%	$ 89,661
47	Year 47	12,900,000	10,737,315	2,162,685	7.87%	170,203	1.6286	277,193	230,910	508,103	$ 89,661	3.40%	$ 92,710
48.	Year 48	12,900,000	10,968,225	1,931,775	7.87%	152,031	1.6286	247,598	230,910	478,508	$ 92,710	3.40%	$ 95,862
49.	Year 49	12,900,000	11,199,135	1,700,865	7.87%	133,858	1.6286	218,001	230,910	448,911	$ 95,862	3.40%	$ 99,122
50.	Year 50	12,900,000	11,430,045	1,469,955	7.87%	115,685	1.6286	188,405	230,910	419,315	$ 99,122	3.40%	$ 102,492
51.	Year 51	12,900,000	11,660,955	1,239,045	7.87%	97,513	1.6286	158,810	230,910	389,720	$ 102,492	3.40%	$ 105,976
52.	Year 52	12,900,000	11,891,865	1,008,135	7.87%	79,340	1.6286	129,213	230,910	360,123	$ 105,976	3.40%	$ 109,579
53.	Year 53	12,900,000	12,122,775	777,225	7.87%	61,168	1.6286	99,618	230,910	330,528	$ 109,579	3.40%	$ 113,305
54.	Year 54	12,900,000	12,353,685	546,315	7.87%	42,995	1.6286	70,022	230,910	300,932	$ 113,305	3.40%	$ 117,157
55.	Year 55	12,900,000	12,584,595	315,405	7.87%	24,822	1.6286	40,425	230,910	271,335	$ 117,157	3.40%	$ 121,140
56.	Year 56	12,900,000	12,815,505	84,495	7.87%	6,650	1.6286	10,830	230,910	241,740	$ 121,140	3.40%	$ 125,259
57.	Year 57	12,900,000	12,900,000	-	7.87%		1.6286	-	84,495	84,495	$ 125,259	3.40%	$ 129,518
58.													
59.	Life to Date Cost and Benefit									59,084,192			3,353,137
60.													
61.													
62.	* Annual increse in CPI based on November, 2022 data.												
63.													
64.													

12.3
Infrastructure Replacement Project Cost Estimates

12.3.1 10-Year Infrastructure Replacement Preliminary Cost Estimate – Pinetop Lakes Water System

ARIZONA WATER COMPANY				DATE PREPARED:
PRELIMINARY COST ESTIMATE				12/20/2011
PREPARED BY:	APPROVED BY:	SYSTEM:	DIVISION:	
AJH	FKS	PINETOP LAKES	NAVAJO	
PROJECT LOCATION:		PROJECT NUMBER:	REFERENCE MAP:	
PROJECT DESCRIPTION:				
PINETOP LAKES WATER SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN				

MATERIALS AND LABOR				
QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
800	EA	$ 3,000	REPLACE PLASTIC SERVICES	$ 2,400,000
8,800	LF	90	REPLACE PROBLEMATIC MAINS W/ 6" DIP	792,000
				-
				-
				-
				-
				-
				-
				-
				-
				-
				-
				-
(1) SUBTOTAL - MATERIALS AND LABOR				3,192,000
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)				47,880
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION				223,440
(4) SUBTOTAL - LINES (1), (2) AND (3)				$ 3,463,320
(5) OVERHEAD - 15% OF LINE (4)				519,498
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS				207,799
SUBTOTAL - LINES (4), (5) AND (6)				$ 4,190,617
ESTIMATED COST OF CONSTRUCTION				$ 4,190,617

AFH

12.3.2 10-Year Infrastructure Replacement Preliminary Cost Estimate – Overgaard Water System

ARIZONA WATER COMPANY

PRELIMINARY COST ESTIMATE

DATE PREPARED: 12/20/2011

PREPARED BY:	APPROVED BY:	SYSTEM:	DIVISION
AJH	FKS	OVERGAARD	NAVAJO

PROJECT LOCATION:	PROJECT NUMBER:	REFERENCE MAP:

PROJECT DESCRIPTION:

OVERGAARD WATER SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN

MATERIALS AND LABOR

QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
18,200	LF	$ 60	REPLACE PROBLEMATIC MAINS W/ 6" DIP	$ 1,092,000
2,100	EA	3,000	REPLACE PLASTIC SERVICES	6,300,000
4,200	EA	500	RETROFIT METER BOXES FOR FREEZE PROTECTION	2,100,000
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				-
				-
				-
				-
				-
(1) SUBTOTAL - MATERIALS AND LABOR				9,492,000
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)				142,380
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION				664,440
(4) SUBTOTAL - LINES (1), (2) AND (3)				$ 10,298,820
(5) OVERHEAD - 15% OF LINE (4)				1,544,823
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS				617,929
SUBTOTAL - LINES (4), (5) AND (6)				$ 12,461,572
ESTIMATED COST OF CONSTRUCTION				$ 12,461,572

AFH

12.3.3 10-Year Infrastructure Replacement Preliminary Cost Estimate – Miami Water System

ARIZONA WATER COMPANY

PRELIMINARY COST ESTIMATE

DATE PREPARED: 12/21/11

PREPARED BY:	APPROVED BY:	SYSTEM:	DIVISION:
MRL	FKS	MIAMI	SUPERSTITION

PROJECT LOCATION:	PROJECT NUMBER:	REFERENCE MAP:

PROJECT DESCRIPTION:

MIAMI SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN

MATERIALS AND LABOR

QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
24,917	LF	$ 68	REPLACE 1930-1939 MAINS w/ 6" DIP	$ 1,694,356
5,903	LF	98	REPLACE 1930-1939 MAINS w/ 8" DIP	578,494
856	LF	128	REPLACE 1930-1939 MAINS w/ 12" DIP	109,568
38,387	LF	$ 68	REPLACE 1940-1949 MAINS w/ 6" DIP	2,610,316
43,319	LF	68	REPLACE PROBLEMATIC MAINS 1950&NEWER W/ 6" DIP	2,945,692
1,750	EA	3,000	REPLACE SERVICES ON MAINS 1910-1949	5,250,000
250	EA	3,000	REPLACE PLASTIC SERVICES	750,000
				-
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				-
				-
				-
				-
(1) SUBTOTAL - MATERIALS AND LABOR				13,938,426
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)				209,076
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION				975,690
(4) SUBTOTAL - LINES (1), (2) AND (3)				**$ 15,123,192**
(5) OVERHEAD - 15% OF LINE (4)				2,268,479
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS				907,392
SUBTOTAL - LINES (4), (5) AND (6)				**$ 18,299,063**
ESTIMATED COST OF CONSTRUCTION				**$ 18,299,063**

AFH

12.3.4 10-Year Infrastructure Replacement Preliminary Cost Estimate – Rimrock Water System

ARIZONA WATER COMPANY

PRELIMINARY COST ESTIMATE

DATE PREPARED: 12/20/2011

PREPARED BY:	APPROVED BY:	SYSTEM:	DIVISION:
AJH	FKS	RIMROCK	VERDE VALLEY

PROJECT LOCATION:	PROJECT NUMBER:	REFERENCE MAP:

PROJECT DESCRIPTION:

RIMROCK WATER SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN

MATERIALS AND LABOR

QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
40,100	LF	$ 75	REPLACE PROBLEMATIC MAINS W/ 6" DIP	$ 3,007,500
300	EA	3,000	REPLACE SERVICES ON PROBLEMATIC MAINS	1,020,000
640	EA	3,000	REPLACE PLASTIC SERVICES	1,920,000
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				-
				-
				-
(1) SUBTOTAL - MATERIALS AND LABOR				5,947,500
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)				89,213
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION				416,325
(4) SUBTOTAL - LINES (1), (2) AND (3)				$ 6,453,038
(5) OVERHEAD - 15% OF LINE (4)				967,956
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS				387,182
SUBTOTAL - LINES (4), (5) AND (6)				$ 7,808,176
ESTIMATED COST OF CONSTRUCTION				$ 7,808,176

AFH

12.3.5 10-Year Infrastructure Replacement Preliminary Cost Estimate – Bisbee Water System

ARIZONA WATER COMPANY

PRELIMINARY COST ESTIMATE

DATE PREPARED: 7/1/2011

PREPARED BY:	APPROVED BY:	SYSTEM:	DIVISION:
MRL	FKS	BISBEE	COCHISE

PROJECT LOCATION:	PROJECT NUMBER:	REFERENCE MAP:

PROJECT DESCRIPTION:

BISBEE WATER SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN

MATERIALS AND LABOR

QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
40,379	LF	$ 70	REPLACE 1900-1909 MAINS w/ 6" DIP	$ 2,826,530
3,153	LF	100	REPLACE 1900-1909 MAINS w/ 8" DIP	315,300
20,139	LF	130	REPLACE 1900-1909 MAINS w/ 12" DIP	2,618,070
21,701	LF	70	REPLACE 1910-1919 MAINS w/ 6" DIP	1,519,070
14,077	LF	70	REPLACE 1920-1929 MAINS w/ 6" DIP	985,390
6,731	LF	70	REPLACE 1930-1939 MAINS w/ 6" DIP	471,170
23,684	LF	70	REPLACE 1940-1949 MAINS w/ 6" DIP	1,657,880
58,551	LF	70	REPLACE PROBLEMATIC MAINS 1950&NEWER W/ 6" DIP	4,098,570
1,500	EA	2,000	REPLACE SERVICES ON MAINS 1900-1949	3,000,000
215	EA	2,000	REPLACE PLASTIC SERVICES	430,000
				-
				-
				-
(1) SUBTOTAL - MATERIALS AND LABOR				17,921,980
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)				268,830
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION				1,254,539
(4) SUBTOTAL - LINES (1), (2) AND (3)				**$ 19,445,349**
(5) OVERHEAD - 15% OF LINE (4)				2,916,802
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS				1,166,721
SUBTOTAL - LINES (4), (5) AND (6)				**$ 23,528,872**
ESTIMATED COST OF CONSTRUCTION				**$ 23,528,872**

AFH

12.3.6 10-Year Infrastructure Replacement Preliminary Cost Estimate – Pinewood Water System

ARIZONA WATER COMPANY PRELIMINARY COST ESTIMATE			DATE PREPARED: 12/20/2011
PREPARED BY: AJH	APPROVED BY: FKS	SYSTEM: PINEWOOD	DIVISION: VERDE VALLEY
PROJECT LOCATION:		PROJECT NUMBER:	REFERENCE MAP:
PROJECT DESCRIPTION: PINEWOOD WATER SYSTEM 10-YEAR INFRASTRUCTURE REPLACEMENT PLAN			

MATERIALS AND LABOR

QUANTITY	UNIT	$/UNIT	DESCRIPTION	ESTIMATED ITEM COST
2,400	EA	$ 4,000	REPLACE PLASTIC SERVICES	$ 9,600,000
15,400	LF	240	REPLACE PROB. MAINS W/ 6" DIP (INCL. SERVICES)	3,696,000
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				-
				-
				-

(1) SUBTOTAL - MATERIALS AND LABOR	13,296,000
(2) PERFORMANCE BOND @ 1.5% OF LINE (1)	199,440
(3) SURVEY, R.O.W. PERMITTING, TESTING AND FIELD INSPECTION	930,720
(4) SUBTOTAL - LINES (1), (2) AND (3)	$ 14,426,160
(5) OVERHEAD - 15% OF LINE (4)	2,163,924
(6) PREPARATION OF DETAILED PLANS, SPECIFICATIONS & BIDDING DOCUMENTS	865,570
SUBTOTAL - LINES (4), (5) AND (6)	$ 17,455,654
ESTIMATED COST OF CONSTRUCTION	$ 17,455,654

AFH

ATTACHMENT 1

DISTRIBUTION SYSTEM IMPROVEMENT CHARGES

ARIZONA WATER COMPANY
Robert W. Geake (No. 009695)
Vice President and General Counsel
3805 N. Black Canyon Highway
Phoenix, Arizona 85012-5351
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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 AND FOR CERTAIN RELATED APPROVALS BASED THEREON.

Docket No. W-01445A-08-0440

CERTIFICATE OF FILING COMPLIANCE ITEM

The Arizona Corporation Commission (the "Commission"), in Decision No. 71845 (the "Decision") at page 95, lines 1-7, 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. The Commission further ordered that the study should further detail costs, rate impacts and consider how to balance costs and benefits for customers and that the Company shall undertake this study and file a report detailing the findings of this study by June 30, 2011, with Docket Control, as a compliance item in this docket.

The Company filed the initial form of the DSIC study in this docket on June 29, 2011 in compliance with the Decision. The Company is now filing an update to the DSIC study in this docket, attached hereto as Attachment A.

RESPECTFULLY SUBMITTED this 22nd day of July 2011.

ARIZONA WATER COMPANY

By: Robert W. Geake

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

CERTIFICATE OF SERVICE

An original and thirteen (13) copies of the foregoing were delivered this 22nd day of July, 2011 to:

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

A copy of the foregoing was mailed this 22nd day of July, 2011 to:

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

Wesley C. Van Cleve, Attorney
Legal Division
Arizona Corporation Commission
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By: Robert W. Geake

EXHIBIT

A

Arizona Water Company
Distribution System Improvement Charge (DSIC) Study
Docket No. W-01445A-08-0440
July 22, 2011

ATTACHMENT A

Arizona Water Company
Distribution System Improvement Charge (DSIC) Study
Docket No. W-01445A-08-0440
July 22, 2011

Introduction and 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 ordered that the information contained in the study should be used by the Company to further develop this issue for future Commission consideration.

This DSIC study examines costs and effects on customer rates and takes into consideration how to balance the costs and benefits of necessary infrastructure replacements for customers. It is submitted to the Commission to provide the information discussed above, to establish the basis and need for implementing a DSIC mechanism to address aging and failing infrastructure, and to urge the Commission to approve such a mechanism in the Company's general rate cases.

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 twenty-two (22) public water systems that serve approximately 84,300 customers.

Historical Development of DSIC

The pressing need to replace aging drinking water infrastructure has been brought to the forefront of public attention by entities such as the United States Environmental Protection Agency (the "EPA") and 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]

In Decision No. 71845, the Commission noted that aging infrastructure is often seen as an East Coast or Midwest phenomenon. However, according to the EPA report cited above, water providers in Arizona will need to fund nearly $7.4 billion of water system infrastructure replacements over the next twenty years, over half of which is needed for transmission and

[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.

distribution system replacements. The EPA report further identified infrastructure funding needs for medium and small-sized water providers in Arizona as $2.1 billion and $889 million, respectively.

The EPA report classified medium sized community water systems as those that serve more than 3,300 but less than 100,000 persons. Community water systems serving 3,300 persons or fewer are classified as small. Based on the EPA's classification the Company's Ajo, Stanfield, Tierra Grande, Coolidge Airport and Winkelman systems are classified as small systems. All of the Company's other systems are classified as medium systems.

In recognition of this growing crisis, regulated water utilities have begun to develop ways along with their state regulatory commissions, to provide rate mechanisms to help fund the replacement and rehabilitation of failing infrastructure while, at the same time, balancing financial stability with customer affordability. In 1996, Philadelphia Suburban Water Company ("PSWC") petitioned the Pennsylvania Public Utility Commission ("PPUC") for approval of a DSIC. The PSWC DSIC was designed to recover the fixed costs (depreciation and pre-tax return) of certain non-revenue-producing infrastructure rehabilitation and replacement 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 mains or less than one-half of one percent each year, due to funding limitations. According to PSWC, at that pace, it would take approximately 212 years to complete all of the needed replacements/rehabilitations to its transmission and distribution mains. PSWC also noted that the DSIC would help it break the cycle of filing for general rate increases every fifteen (15) months, thus reducing the frequency of rate filings to the benefit of both customers and the PPUC.

The DSIC proposed by PSWC included a number of limitations. Among these were restrictions on the type of utility plant eligible for cost recovery, quarterly filing requirements, a cap on the maximum amount of revenue that could be collected by the DSIC, an eligibility earnings test, and a true-up mechanism which reset the DSIC to zero when the underlying utility plant was included in base rates in a subsequent general rate case.

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 plants 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

[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.*

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 adopting 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, such as DSIC revenues capped at a percentage of general revenues, resetting the DSIC to zero at the time of the next general rate case, providing notice to customers of any change in the DSIC rate, audits conducted as needed, and an annual reconciliation audit.[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, the Commission Staff and the Residential Utility Consumer Office ("RUCO"). The ACRM allows utilities that construct 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.

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 water mains and service lines that are approaching or have already exceeded the end of 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

[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.*

date back to the early 1900s, and nearly thirty-five percent (35%) 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 need to be replaced. Even water systems viewed as more modern, such as the Company's Pinal Valley water system, have many water mains that were installed during the period of time from the 1920s through the 1940s.

The materials used in the manufacture of pipe and services play 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 water main breaks, 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. Even the gasket materials made to seal the joints between pipes can degrade and fail. 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 however, it has been found that 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, including pitting and tuberculation, as seen in galvanized steel water mains.

Soil condition is an example of the factors that contribute to corrosion of water mains. When the Company first considered the use of ductile iron pipe, it 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 determine whether soils were conductive and would lead to corrosion. Because corrosion is an electrochemical process, conductive soil is likely to lead to corrosion in water mains made of ferrous or copper materials. 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 the Company's experience with corrosive soil conditions in some of its water systems. These measures will help 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 replaces aging pre-1986 infrastructure, it uses polywrap, as necessary, 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 has replaced 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. CA pipe accounts for forty-six percent (46%) of the water distribution system in the Pinal Valley water system.

Every water system has measurable system water losses. As pipes age, the frequency of water main and service line breaks and leaks increases. This observation was confirmed by an EPA research program titled "Aging Water Infrastructure Research Program" which found that the earliest sign of aging pipes is an increasing frequency of water main leaks. The condition of pipes degrades over time and, at some point, repairs alone are inadequate to reduce water losses. When reduction of system water losses through leak detection and repairs cannot reasonably keep pace with the increasing rate of leaks or breaks, the Company then needs to replace the water mains.

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 it intends to reduce water losses to less than ten percent (10%). It is not possible for the Company to comply with that standard for all of its water systems and it will submit such a report to the Commission. The report will show that, absent a DSIC-type mechanism, it is unable to replace all of the infrastructure required to lower the water loss to meet the Commission's standard.

Economic Discussion

One of the important economic considerations that influences the Company's decision to invest in needed water distribution system improvements is the fact that replacement costs have increased dramatically over time. For example, in the Pinal Valley water system, nearly 14,000 feet of cast iron water mains were installed from 1921 to 1929. According to the Handy-

Whitman engineering cost index (an index that tracks construction costs over time), the cost factor for a cast iron water main installed in 1921 is 27, while the cost factor for a cast iron water main installed in 2010 is 587. This means that the replacement cost for such a water main in 2010 is 22 times greater than the original installation cost ninety years ago in 1921. Even though this is a significant increase, the index does not consider the full increase in construction costs over time, as water main installation in the 1920s was much less complicated than it is today. For example, modern day excavation must take into account the multitude of competing underground infrastructures such as sewer, power, and gas lines, as well as fiber optic and data networks. It should also be noted that these water mains are in service and that service to customers must be maintained during the replacement project, which complicates the process and adds significant additional cost.

As part of its efforts to monitor and identify the sources and remedies for water loss, the Company conducted a detailed analysis of its Superstition, Pinal Valley, Bisbee and Oracle service areas and concluded that, based upon water main repair logs and the age of the distribution system, approximately 521,000 feet of water mains need to be replaced. Additionally, service line repair records show that approximately 9,820 failing plastic service lines and 8,321 services on failing water mains need to be replaced.[8] The preliminary cost estimate for these much-needed utility plant replacements is over $102 million, as shown in the table below:

QUANTITY	DESCRIPTION	ESTIMATED COST
40,379	Replace Failing Water Mains 1900 - 1909	$ 2,826,530
22,712	Replace Failing Water Mains 1910 - 1919	1,587,818
29,737	Replace Failing Water Mains 1920 - 1929	1,780,750
61,590	Replace Failing Water Mains 1930 - 1939	4,019,164
324,647	Replace Failing Problematic Water Mains 1940 and later	16,545,154
41,838	Replace Failing Large Diameter Water Mains	5,221,060
8,321	Replace Services on Failing Water Mains	19,692,000
9,770	Replace Failing Plastic Services	25,287,500
Subtotal - Materials and Labor		$ 76,959,976
Performance Bonds, Surveying, Right of Way Permitting, Testing, Field Inspection and Overhead		25,068,721
Estimated Cost of Construction		$ 102,028,697

[8] The first study titled "Water Loss Reduction Program for the Pinal Valley Service Area" is attached to Mr. Schneider's direct testimony in Docket W-01445A-10-0517 as Exhibit FKS-10. The second study titled "Water Loss Reduction Program for Water Systems in the Eastern Group" is an exhibit in the Company's Eastern Group rate case.

It is significant that one of the key facts that led to the development of the ACRM was the magnitude of the approximately $30 million the Company needed to invest in water treatment systems to remove arsenic from its public drinking water supplies. But that amount is $72 million less than the estimated $102 million capital cost needed for infrastructure replacement for the Superstition, Pinal Valley, Bisbee and Oracle systems.

When a utility is faced with a large capital project, its cost and construction timeline are usually known well in advance. With that knowledge, the utility can try to time its rate case filing to coincide with completion of the facility to minimize the amount of earnings erosion. In the case of the Company's infrastructure replacement program, funding a project of this size and magnitude would be a difficult if not impossible task, given the Company's capitalization (approximately $150 million) and status as a privately-held entity. Assuming the Company was able to issue additional long-term debt to fund such a project, the traditional utility regulatory model would cause equity to erode at an unacceptable rate during the twelve to eighteen months it would take to conduct a general rate case.

The situation is further complicated by the fact that the Company's infrastructure replacement program 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 during the construction period would be nominal. Because these replacement programs do not increase sales, they will not generate additional revenues. In order to generate a financial return, the Company would be forced to file for annual general rate increases under the traditional rate case model, also resulting in erosion of earnings and equity. Such an erosion of the Company's equity balance would result in unsatisfactory financial ratios, the inability to issue short or long term debt and lead to higher costs for customers.

The DSIC discussed above was designed specifically to address this problem: it allows water providers to implement critical infrastructure replacement programs and recover the associated costs on a timely basis to ensure both the financial integrity of the utility and lower long-term average costs to customers.

DSIC Details

The Company proposes implementation of a DSIC 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 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 service lines 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.

The National Regulatory Research Institute ("NRRI"), in its publication *Effective Regulation: Guidance for Public-Interest Decision Makers*, cited infrastructure replacement as posing several challenges for utilities and regulatory commissions, including how to finance infrastructure replacements such that rates increase gradually (as opposed to sudden spikes) while maintaining the utilities financial stability.[9] Implementation of a DSIC would help meet those goals by providing the Company with the necessary financial means to invest in replacement of 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 $0.87.[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 $2.58. 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 may hold 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.

Conclusion

Water distribution systems have a limited life and must eventually be replaced. The replacement of aging water system 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 a recent national survey shows that hundreds of billions of dollars in capital investments are needed to replace aging water system infrastructure in this country.

[9] Exhibit H: *Effective Regulation: Guidance for Public-Interest Decision Makers* produced by the National Regulatory Research Institute
[10] Exhibit I: *DSIC Revenue Requirement*
[11] Exhibit J: *ITT Corporation Value of Water Survey, Americans on the U.S. Water Crisis, 2010*

In a detailed study focusing on its Superstition, Pinal Valley, Bisbee and Oracle service areas, the Company identified over $102 million in critically needed water main and service line 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. 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 its 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 show that significant water main and service line 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 much needed water distribution system replacements 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 in water distribution system improvements. 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.

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.

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.

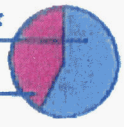
The Congressional Budget Office (CBO) concluded in 2003 that "current funding from all levels of government and current revenues generated from ratepayers will not be sufficient to meet the nation's future demand for water infrastructure." The CBO estimated the nation's needs for drinking water investments 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 Inventory of Dams, U.S. Army Corps of Engineers, 2008.
Drinking Water Needs Survey and Assessment, Environmental Protection Agency, 2003.
National Biennial RCRA Hazardous Waste Report, Environmental Protection Agency, 2007.
The U.S. Waterway System – Transportation Facts, Navigation Data Center, U.S Army Corps of Engineers, February 2007.
2007 Annual Report, Land and Water Conservation Fund State Assistance Program, National Park Service.
TRIP Fact Sheet, March 2009.
Clean Water Needs Survey, Environmental Protection Agency, 2004.

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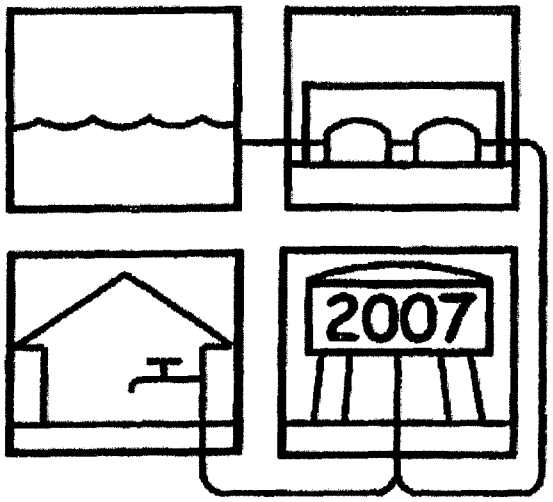
Virginia (/state-page/virginia)

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

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.

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:

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

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.]

webmaster@PaBulletin.com

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, reli
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 rate 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**

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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

INFRASTRUCTURE REPLACEMENT AND ASSET MANAGEMENT[16]

Surveys conducted by the EPA suggest that the need for water and wastewater infrastructure improvement and replacement (both privately and publicly owned) over the next 20 years is between $500 billion and $1 trillion. This dollar level reflects a growing need across the nation to replace water and sewer pipes and other water and wastewater facilities as they approach the end of their useful lives.

The reason for this surge in infrastructure needs stems from the population boom and economic growth at the end of World War II. During those post-war years, there was unprecedented industrial, business, commercial and residential development, along with the water and wastewater infrastructure to support it. That infrastructure is now reaching the age when it is beginning to wear out and needs to be upgraded or replaced. Water and wastewater utilities need to manage those assets actively or risk adverse economic consequences, such as unplanned system failures, increased maintenance costs, and unbudgeted repair and replacement costs. Depending on the length of the useful life of various components, the need to replace this infrastructure will continue over the next several decades.

Many utilities have conducted plans consisting of a complete assessment of utility facilities and assets, including a determination of the condition and remaining useful life of each component of the system, right down to each segment of buried pipe. Components of the system are also rated in terms of criticality for operation of the system. A model is often developed based on asset condition, criticality, and other relevant factors to prioritize the infrastructure replacement and improvement needs over time. Costs are then applied to determine reinvestment needs over time.

The goal of these plans is to determine a reinvestment timeline that will allow continued operation of critical infrastructure throughout its useful life, but will ensure replacement before it fails and before maintenance costs increase dramatically. Planners then can prepare infrastructure replacement schedules and budgets that will spread out the costs of improvements over a pre-established planning horizon. This scheduling and budgeting will avoid unplanned maintenance and capital costs to the utility while maintaining efficient operation of the system.

This situation poses several challenges for utilities and regulatory commissions. One challenge is how to finance the necessary infrastructure replacements such that (a) rates increase gradually (as opposed to sudden spikes in rates) while (b) maintaining the utilities' financial stability. A second challenge is ensuring that the large expenditures are made prudently, so as to win and sustain customer trust and political credibility. Adding to the challenge is the absence, for most utilities, of a designated fund available to replace aging infrastructure—an absence attributable to ratemaking practices which have kept depreciation rates low and have disallowed or discouraged rate recovery of contributions in aid of construction.

EXHIBIT

I

ARIZONA WATER COMPANY
DSIC Revenue Requirement
As of December 31, 2010

Line No.		[A] Pinal Valley
1	TEST YEAR DATA	
2		
3	Eligible DSIC Plant in Service	$ 2,500,000
4	Accumulated Depreciation (Sch. B, p. 1)	-
5	Eligible DSIC Plant Rate Base	$ 2,500,000
6	Required Rate of Return (Proposed)	9.51%
7	Required Operating Income (Ln. 6 x Ln. 7)	$ 237,750
8	Revenue Conversion Factor (Decision No. 71845)	1.8569
9	Revenue Requirement - Return on Eligible DSIC Plant (Ln. 9 x Ln. 11)	$ 393,927
10		
11	Depreciation on Eligible DSIC Plant (Sch. B, p. 1)	$ 45,248
12		
13	Total Revenue Requirement (Ln. 13 + Ln. 16)	$ 439,175
14		
15	Total Operating Revenue	17,358,501
16		
17	Maximum increase cap	7.5%
18		
19	Total Operating Revenue Limited by cap (Ln. 22 X Ln. 24)	$ 1,301,888
20		
21	Total Revenue Requirement lesser of L 19 or 26	$ 439,175

PINAL VALLEY (CASA GRANDE/COOLIDGE)

	Current Rates	Proposed Rates	
	Decision No. 71845	DSIC	Total [B + C]
5/8 X 3/4-INCH RESIDENTIAL METER			
Basic Service Charge	$ 15.79	$ 0.50	$ 16.29
Commodity Rate (Per M Gallon)			
0 - 3,000 Gallons	$ 1.3700	$ 0.0437	1.4137
3,001 - 10,000 Gallons	$ 1.7123	$ 0.0437	1.7560
Over 10,000 Gallons	$ 2.1406	$ 0.0437	2.1843

PINAL VALLEY (STANFIELD)

	Current Rates	Proposed Rates	
	Decision No. 71845	DSIC	Total [B + C]
5/8 X 3/4-INCH RESIDENTIAL METER			
Basic Service Charge	$ 15.79	$ 0.50	$ 16.29
Commodity Rate (Per M Gallon)			
0 - 3,000 Gallons	$ 2.4379	$ 0.0437	2.4816
3,001 - 10,000 Gallons	$ 3.0476	$ 0.0437	3.0913
Over 10,000 Gallons	$ 3.8097	$ 0.0437	3.8534
Average Residential Bill (5/8 x 3/4 meter) - Casa Grande / Coolidge (8,522 gallons of usage)	$ 29.36	$ 0.87	$ 30.23
Average Residential Bill (5/8 x 3/4 meter) - Stanfield (8,522 gallons of usage)	$ 39.93	$ 0.87	$ 40.81

EXHIBIT

J

ITT

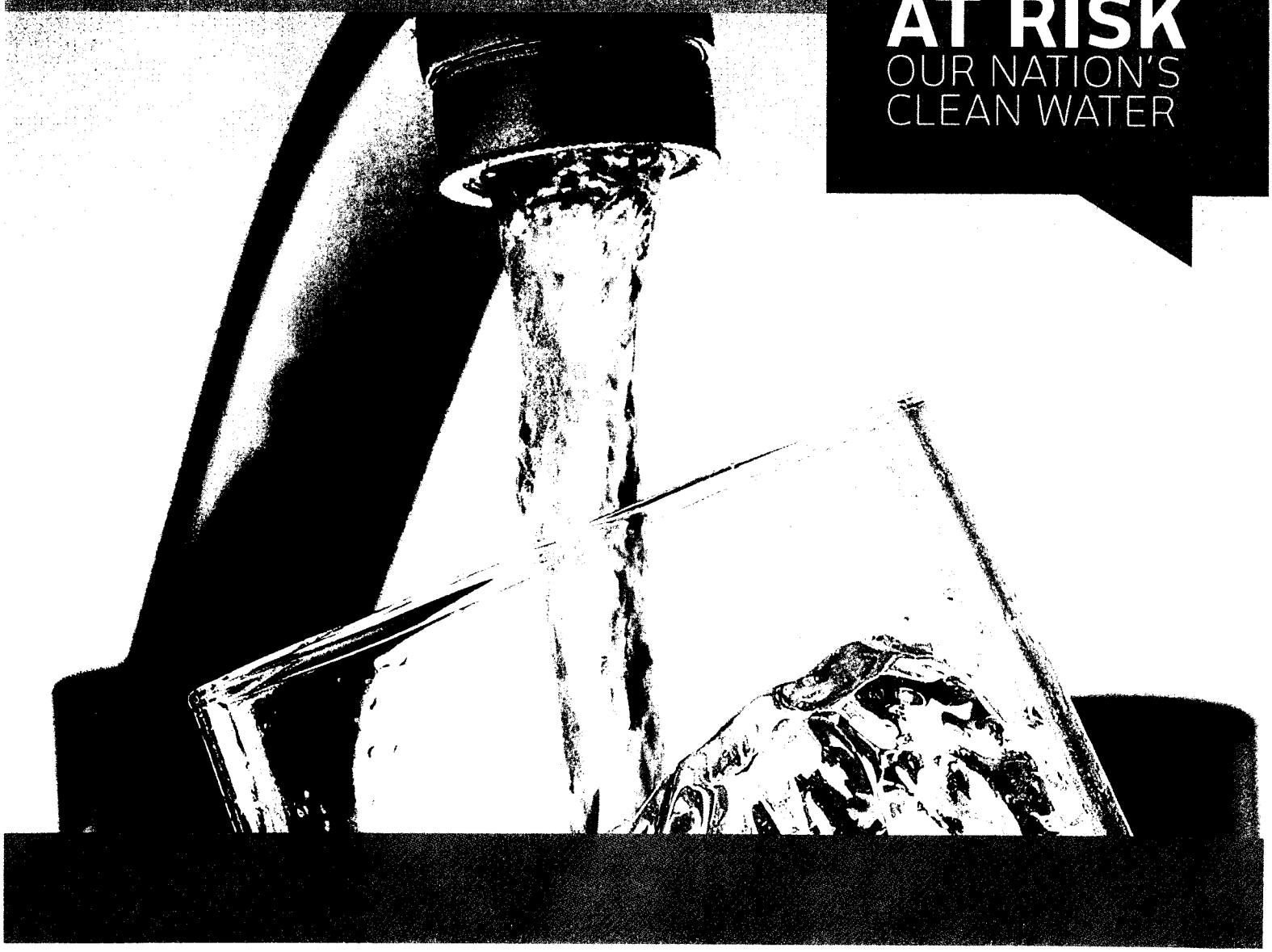
VALUE OF WATER SURVEY

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



BACKGROUND

Water has for too long been absent from the national debate on infrastructure. Hidden underground, the deterioration of our nation's water pipes and treatment systems has become an unseen crisis. In an era of water scarcity and tight budgets, we can no longer afford to lose nearly two trillion gallons of clean water, at an annual cost of $2.6 billion, to broken and leaking pipes every year.

Americans agree.

ITT's nationwide survey on the value of water details what Americans think should be done about this crisis—and who should pay for it.

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

CD

-A Report on Arizona Water Company's Plan to Reduce Water Losses
December 30, 2011
(Searchable PDF)

TO REVIEW SEE DOCKET SUPERVISOR

DOCKET
W-01445A-08-0440

A REPORT ON ARIZONA WATER COMPANY'S PLAN TO REDUCE WATER LOSSES

December 30, 2011

(Searchable PDF)

Water Systems Evaluated in this Report

PWSID NO. 11-707	-	**COOLIDGE AIRPORT**
PWSID NO. 09-018	-	**PINETOP LAKES**
PWSID NO. 09-004	-	**OVERGAARD**
PWSID NO. 04-002	-	**MIAMI**
PWSID NO. 13-046	-	**RIMROCK**
PWSID NO. 02-001	-	**BISBEE**
PWSID NO. 03-002	-	**PINEWOOD**